

First record of Mathiasson's Treefrog, *Dendropsophus mathiassoni* (Cochran & Goin, 1970) (Anura, Hylidae), for Venezuela

Fernando J.M. Rojas-Runjaic^{1,*}, César L. Barrio-Amorós², and Santiago Castroviejo-Fisher³

Dendropsophus mathiassoni (Cochran & Goin, 1970) is a small nocturnal treefrog that typically inhabits grassy and shrub savannas associated with bodies of water (Lynch, 2006). It can be found perched on leaves and branches next to and above water (Cáceres-Andrade and Urbina-Cardona, 2009). This frog also thrives in man-modified environments, where it can become very abundant (Lynch, 2006; Cáceres-Andrade and Urbina-Cardona, 2009). Its diet is completely insectivorous, and it feeds mainly on ants and beetles (Astwood-Romero et al., 2016). It is active across the entire year, although its activity increases during the rainy season, when it breeds. Its eggs are laid in temporary and permanent bodies of water, where its free-living exotrophic tadpoles develop (Cáceres-Andrade and Urbina-Cardona, 2009).

Dendropsophus mathiassoni is widely distributed in the savannas of the Colombian Llanos, with its northernmost and easternmost records located on the riverbanks of the Arauca and Orinoco Rivers, respectively (Acosta-Galvis, 2021). Its presence in the Llanos region of Venezuela was already anticipated (Barrio-Amorós, 1999), but until now its occurrence had not been corroborated. We here report the occurrence of *Dendropsophus mathiassoni* (Fig. 1A–B) for Venezuela for the first time.

Our report is based on four specimens collected in Fundo Copaiba, Morichito sector, northern Puerto

Ayacucho, Amazonas State, Venezuela (5.6913°N, 67.6090°W; elevation 68 m; Fig. 2). These include three adult males (MHNLS 19832–34) collected on 10 July 2010 and one adult female (MHNLS 21466) collected on 14 May 2014. All specimens were found active during the night (19:00–01:00 h), perched on leaves of grasses and shrubs, between 50–120 cm above ground, on the edge of an artificial permanent pool (Fig. 1C). The three males were calling when found in July 2010, while the female found in May 2014 had mature oviductal eggs (noted through her skin).

Three other species of *Dendropsophus* are sympatric with *D. mathiassoni* in this region (Rivero, 1961; Gehara et al., 2014; Barrio-Amorós et al., 2019), namely *D. microcephalus* (Cope, 1886), *D. minusculus* (Rivero, 1971), and *D. aff. minutus* (Peters, 1872). However, *D. mathiassoni* can be readily distinguished from these three species by lacking a dorsal pattern of dark brown spots, blotches, lines, or reticulations (large spots and blotches present in *D. aff. minutus* and in some *D. minusculus*; longitudinal lines and reticulations in *D. microcephalus*). From *D. minusculus* it differs further by its larger body size (SVL up to 24 mm in *D. mathiassoni* vs. SVL \leq 20 mm in *D. minusculus*), the absence of oblique dark lines on the shanks (present in *D. minusculus*) and its pale grey coloured flanks (lemon yellow in *D. minusculus*) (Rivero, 1961, 1971, Cochran and Goin, 1970, and Señaris et al., 2014). Although this represents the first record of *D. mathiassoni* for Venezuela and is among the easternmost records for the species, this does not imply a significant range extension, given that the nearest previously known localities are in the surroundings of Puerto Carreño, 48–67 km to the north (Durán-Prieto and Herrera-Collazos, 2019; Hoyos et al., 2020), and Cumaribo, P.N.N. Tuparro, 57 km to the southwest (Acosta-Galvis and Borja-Acosta, 2019), both in the department of Vichada, Colombia, on the western bank of the Orinoco River (Fig. 2).

The discovery of *D. mathiassoni* in the savannas of the northwestern portion of Amazonas State in

¹ Museo de Historia Natural La Salle, Fundación La Salle de Ciencias Naturales, Caracas 1050, Distrito Capital, Venezuela.

² Doc Frog Expeditions/CRWild, 60504, Bahía Ballena, Uvita, Costa Rica.

³ Laboratório de Sistemática de Vertebrados, Pontifícia Universidade Católica do Rio Grande do Sul, Avenida Ipiranga 6681, Porto Alegre, RS 90619-900, Brazil.

* Corresponding author. E-mail: rojas_runjaic@yahoo.com

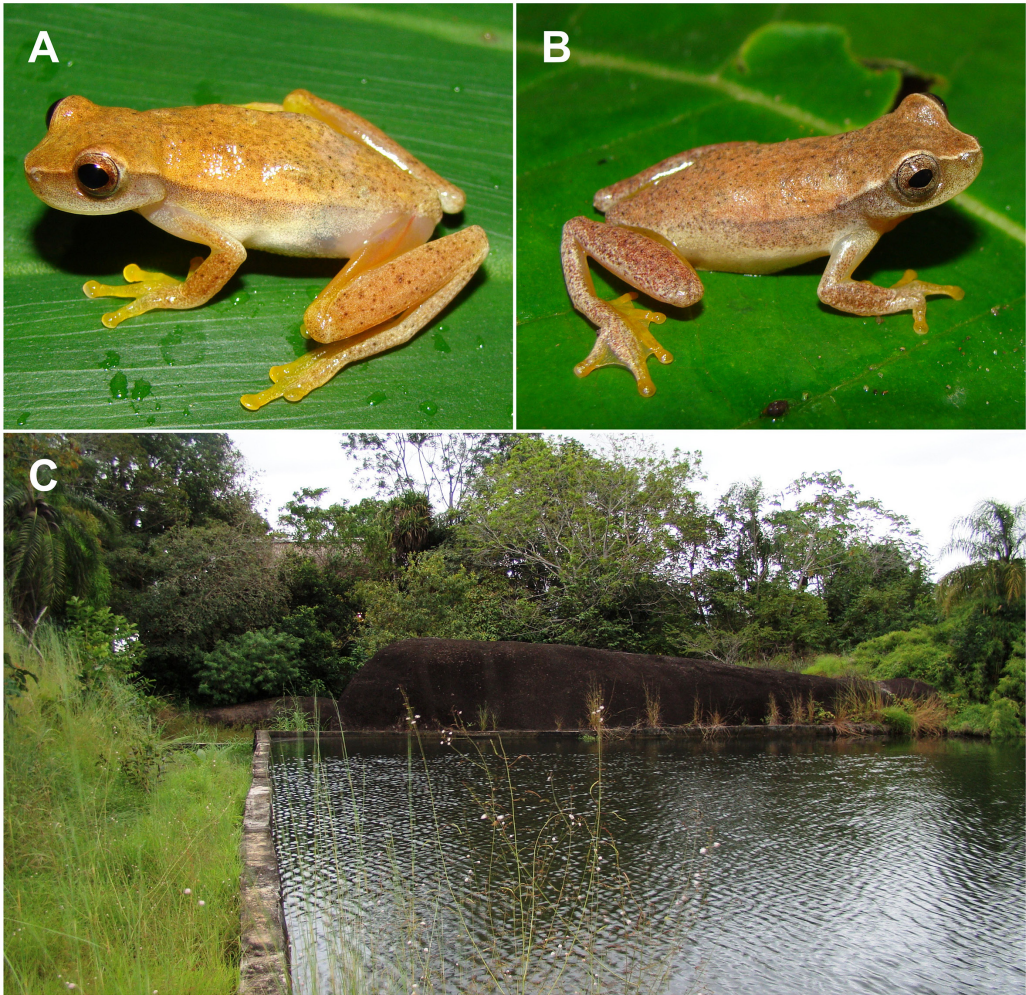


Figure 1. Dorsolateral view of (A) an adult female (MHNLS 21466), and (B) an adult male (MHNLS 19832) of *Dendropsophus mathiassoni* in life (photographs taken at night). (C) Habitat where the specimens were found in Fundo Copaiba, Amazonas State, Venezuela. Photos by F.J.M. Rojas-Runjaic.

Venezuela demonstrates that large watercourses like the Orinoco River do not constitute a barrier for the distribution of this species. This concomitantly implies that its occurrence in the western Llanos of Venezuela, north of the Arauca and Meta Rivers, is likely. However, fieldwork and the study of scientific collections will be required in order to corroborate the occurrence of *D. mathiassoni* in that region.

Most of the known localities of *D. mathiassoni* are in the Llanos bioregion. However, at least one locality is reported to be in the Putumayo-Amazonas interfluvium (Morris, 2020; Fig. 2), a region dominated by moist tropical rainforests. This locality record may correspond to an isolated natural or introduced population in pockets

of natural or human created grasslands, or alternatively correspond to specimen misidentifications. The latter case seems the most plausible explanation for such an outlier locality.

Finally, as *D. mathiassoni* is a typical representative of the Llanos frog fauna, its occurrence in northwestern Amazonas State in Venezuela reinforces the definition of that area as part of the Llanos bioregion (Rivero, 1964; Barrio-Amorós et al., 2019) or as a transitional area between the Llanos and Guayana regions (Berry et al., 1995).

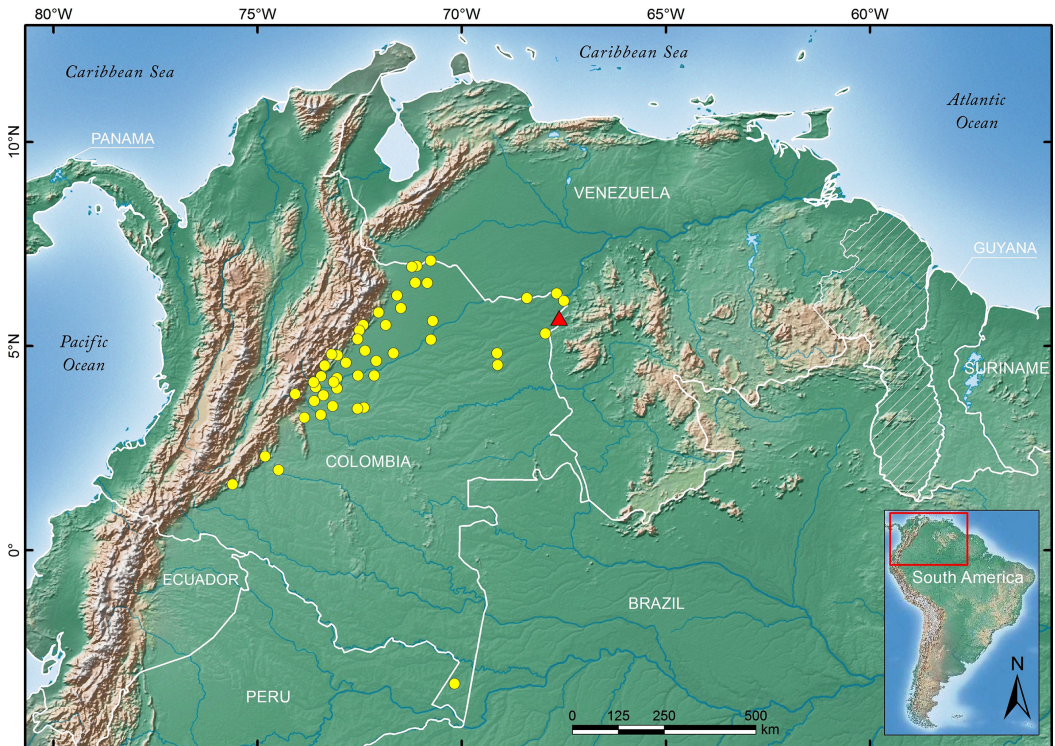


Figure 2. Map of northern South America depicting the geographic distribution of *Dendropsophus mathiassoni* throughout the Llanos region in Colombia and Venezuela. Country limits are indicated by white lines. The diagonally striped area is the disputed territory Guayana Esequiba. Yellow dots represent selected records from literature (Lynch and Suárez-Mayorga, 2011; Blanco et al., 2019; GBIF Secretariat, 2019; Acosta-Galvis, 2021). The red triangle pinpoints the new record for Venezuela (Fundo Copaiba, Morichito sector, Amazonas State).

Acknowledgements. We are indebted to Isabel Parra for her hospitality and logistic support during our fieldtrips to Amazonas. We also thank Arnaldo Ferrer Pérez for logistic support during the fieldtrips of 2013 and 2014, Victor Orrico for the pre-peer review of the manuscript, and the reviewers who helped us to improve a previous version of the manuscript with their constructive criticism. Collection permits (#5179 and #361) were issued to FJMRR through MHNLS, by the Venezuelan Ministerio del Poder Popular para el Ambiente. SCF received financial support from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq code 312744/2017-0), Brazil.

References

- Acosta-Galvis, A.R. (2021): Lista de los anfibios de Colombia: referencia en línea V.11.2021. Villa de Leyva, Colombia. Accessible at: <http://www.batrachia.com>. Accessed on 21 January 2021.
- Acosta-Galvis, A., Borja-Acosta, K. (2019): Colección de anfibios del Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH-Am). Versión 37.2. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt. Occurrence dataset. Accessible at: <https://doi.org/10.15472/dma300>; and via GBIF at: <https://www.gbif.org/occurrence/1707741517>. Accessed on 28 August 2020.
- Astwood-Romero, J.A., Álvarez-Perdomo, N., Parra-Torres, M.F., Rojas-Peña, J.I., Nieto-Vera, M.T. (2016): Contenidos estomacales de especies de anuros en reservas naturales del Municipio de Villavicencio, Meta, Colombia. *Caldasia* **38** (1): 165–181.
- Barrio-Amorós, C.L. (1999 “1998”): Sistemática y biogeografía de los anfibios (Amphibia) de Venezuela. *Acta Biologica Venezuelica* **18** (2): 1–93.
- Barrio-Amorós, C.L., Rojas-Runjaic, F.J.M., Señaris, J.C. (2019): Catalogue of the amphibians of Venezuela: illustrated and annotated species list, distribution, and conservation. *Amphibian & Reptile Conservation* **13** (1): 1–198 (e180).
- Berry, P., Huber, O., Holst, B.K. (1995): Floristic analysis and phytogeography. In: *Flora of the Venezuelan Guayana*. Introduction. Volume 1, p. 161–191. Steyermark, J., Berry, E., Holst, B.K., Eds., Portland, Oregon, USA, Timber Press.
- Blanco Torres, A., Durán Prieto, C., Acosta Galvis, A.R. (2019): Herpetofauna. In: *Biodiversidad en el Departamento de Arauca*, p. 163–187. Trujillo, F., Anzola, F., Eds., Bogotá, Colombia, Gobernación de Arauca, Fundación Omacha, and Fundación Ecollano.

- Cáceres-Andrade, S.P., Urbina-Cardona, J.N. (2009): Ensamblajes de anuros de sistemas productivos y bosques en el piedemonte llanero, Departamento del Meta, Colombia. *Caldasia* **31** (1): 175–194.
- Cochran, D.M., Goin, C.J. (1970): Frogs of Colombia. *Bulletin of the United States National Museum* **288**: 1–655.
- Cope, E.D. (1886): Thirteenth contribution to the herpetology of tropical America. *Proceedings of the American Philosophical Society* **23** (122): 271–287.
- Durán-Prieto, C., Herrera-Collazos, E. (2019): Anfibios y reptiles de las sabanas inundables de las cuencas de los ríos Bita, Manacacías y Cravo Sur - SULU II. Version 1.1. Fundación Omacha. Occurrence dataset. Accessible at: <https://doi.org/10.15472/u2sxcv> and <https://www.gbif.org/occurrence/2005434404>. Accessed on 28 August 2020.
- GBIF Secretariat (2019): GBIF Backbone Taxonomy. *Dendropsophus mathiassoni* (Cochran & Goin, 1970). Checklist dataset. Available at: <https://doi.org/10.15468/39omei>. Accessed on 28 August 2020.
- Gehara, M., Crawford, A.J., Orrico, V.G.D., Rodríguez, A., Lötters, S., Fouquet, A., et al. (2014): High levels of diversity uncovered in a widespread nominal taxon: continental phylogeography of the neotropical tree frog *Dendropsophus minutus*. *PLoS ONE* **9**: e103958.
- Hoyos, J.M., Herrera-Collazos, E.E., Rodríguez-Morales, M.A. (2020): Colección de anfibios del Museo de Historia Natural de la Pontificia Universidad Javeriana. Version 4.2. Pontificia Universidad Javeriana. Occurrence dataset. Accessible at: <https://doi.org/10.15472/y6rwfq> and <https://www.gbif.org/occurrence/2650645677>. Accessed on 28 August 2020.
- Lynch, J.D. (2006): The amphibian fauna in the Villavicencio region of eastern Colombia. *Caldasia* **28** (1): 135–155.
- Lynch, J.D., Suárez-Mayorga, A.M. (2011): Clave ilustrada de los renacuajos en las tierras bajas al oriente de los Andes, con énfasis en Hylidae. *Caldasia* **33** (1): 235–270.
- Morris, P.J. (2020): Museum of Comparative Zoology, Harvard University. Version 162.227. Museum of Comparative Zoology, Harvard University. Occurrence dataset. Accessible at: <https://doi.org/10.15468/p5rupv> and <https://www.gbif.org/occurrence/476484167>. Accessed on 9 September 2020.
- Peters, W.C.H. (1872): Über eine Sammlung von Batrachiern aus Neu Freiburg in Brasilien. *Monatsberichte der Königlich Preussischen Akademie der Wissenschaften zu Berlin* **1872**: 680–684.
- Rivero, J.A. (1961): Salientia of Venezuela. *Bulletin of the Museum of Comparative Zoology* **126** (1): 1–207.
- Rivero, J.A. (1964): The distribution of Venezuelan frogs. VI. The Llanos and the Delta region. *Caribbean Journal of Science* **4** (4): 491–495.
- Rivero, J.A. (1971): Tres nuevos records y una nueva especie de anfibios de Venezuela. *Caribbean Journal of Science* **11** (1–2): 1–9.
- Señaris, J.C., Lampo, M., Rojas-Runjaic, F.J.M., Barrio-Amorós, C.L. (2014): Guía Ilustrada de los Anfibios del Parque Nacional Canaima, Venezuela. Caracas, Venezuela, Ediciones IVIC, Instituto Venezolano de Investigaciones Científicas (IVIC).