

Amphibia, Anura, Hylidae, *Scinax cardosoi* (Carvalho-e-Silva & Peixoto, 1991): distribution extension and new state record for São Paulo, Brazil

Matheus de Toledo Moroti^{1,2,3}, Jonatas Alves Ferreira Neto¹, Andriele Cristina dos Santos¹,
Cristina Pacheco Soares¹ & Ibere Farina Machado²

¹Universidade do Vale do Paraíba. Av. Shishima Hifumi, 2911. 12244-000. São José dos Campos, SP, Brazil

²Instituto Boitatá. Avenida 136, Qd. F-44, Lojas 01 e 02 Setor Sul. 74.093-250. Goiânia, GO, Brazil

³Corresponding author. E-mail: mmoroti@gmail.com

Abstract: Specimens of *Scinax cardosoi* were collected in the vicinity of temporary lentic waterbodies within the Atlantic Rainforest of the Vale do Paraíba region of São Paulo state, Brazil. These record increases the distribution of this species by 236 km from the nearest previous records in Minas Gerais state and 313 km from its type locality in Rio de Janeiro state. Here we report the first record of *Scinax cardosoi* for the São Paulo state.

Key words: geographic distribution; Atlantic Forest; São Paulo; Brazil

The family Hylidae is a group of tree frogs composed of seven subfamilies. One of these, the Scinaxinae (DUELLMAN et al. 2016) is endemic to the Neotropical region from South to Central America (FROST 2016). The subfamily Scinaxinae contains four genera and 130 species, and within the genus *Scinax* Wagler, 1830, 68 species are currently known (FROST 2016). *Scinax cardosoi* (Carvalho-e-Silva & Peixoto 1991), placed in the *Scinax ruber* clade according to FAIVOVICH et al. (2005), is endemic to the Serra da Mantiqueira, Serra do Mar, and Serra do Espinhaço mountain ranges in southeastern Brazil (states of Rio de Janeiro, Espírito Santo, and Minas Gerais) (CARVALHO-E-SILVA & CARAMASCHI 2004; CARVALHO et al. 2015; PINTO et al. 2009; LINARES et al. 2011). This species has small populations with ample distribution, and although the current population trend is declining, populations are not severely fragmented and is classified as “Least Concern” according criteria of the IUCN (CARVALHO-E-SILVA & CARAMASCHI 2004) and the Brazilian (BRASIL 2014) Red Lists. Herein, we report the first record of *S. cardosoi* for the state of São Paulo, Brazil.

Fieldwork was conducted in São José dos Campo, São Paulo state (Figure 1), Brazil, in January 2016, at Parque Natural Municipal Augusto Ruschi (PNMAR), a Conservation Unit of Integral Protection. We collected specimens of

S. cardosoi (System for Biodiversity permit, SISBio 48620-2) and deposited them into the Herpetological Collection of the Universidade Estadual de Campinas (ZUEC-AMP voucher 23323) and the “Célio F. B. Haddad” Collection of the Universidade Estadual Paulista (CFBH voucher 40536-40).

The region consists of 10% municipal area with remnants of Semideciduous Atlantic Rainforest, where PNMAR is one of the most representative fragments of the region (SOS MATA ATLANTICA & INPE 2016). The specimens were found near two different temporary ponds in the PNMAR (23°04'00" S, 045°55'59" W and 23°04'00" S, 045°55'00" W; WGS84). The individuals were perched on shrubby vegetation (about 20–30cm high) where several males were calling. Although the species is categorized as breeding in slow-flowing permanent streams (PINTO et al. 2009; LINARES et al. 2011), which is an environment that exists in the PNMAR, the species was only found displaying reproductive activities in temporary ponds.

Specimen identification was based on characters of the species as presented by CARVALHO-E-SILVA & PEIXOTO (1991): small size, accentuated sexual dimorphism, females larger than males, transverse dark bars on the dorsal surface of limbs and dark longitudinal stripes on the dorsal surface of the body (Figure 2A–B). We confirmed the identification by comparison with specimens housed in collections (ZUEC-AMP 5227, 5228 and 6352; CFBH 22828).

The known distribution for *S. cardosoi* encompasses the mountain chain complex known as Serra do Mar, Serra da Mantiqueira, and part of Serra do Espinhaço (CARVALHO-E-SILVA & CARAMASCHI 2004; CARVALHO et al. 2015; PINTO et al. 2009; LINARES et al. 2011). Our record extends the distribution of *S. cardosoi* 313 km from the type locality (municipality of Teresopolis, Rio de Janeiro state; Figure 1, point 1), 236 km from the closest records (Santa Rita da

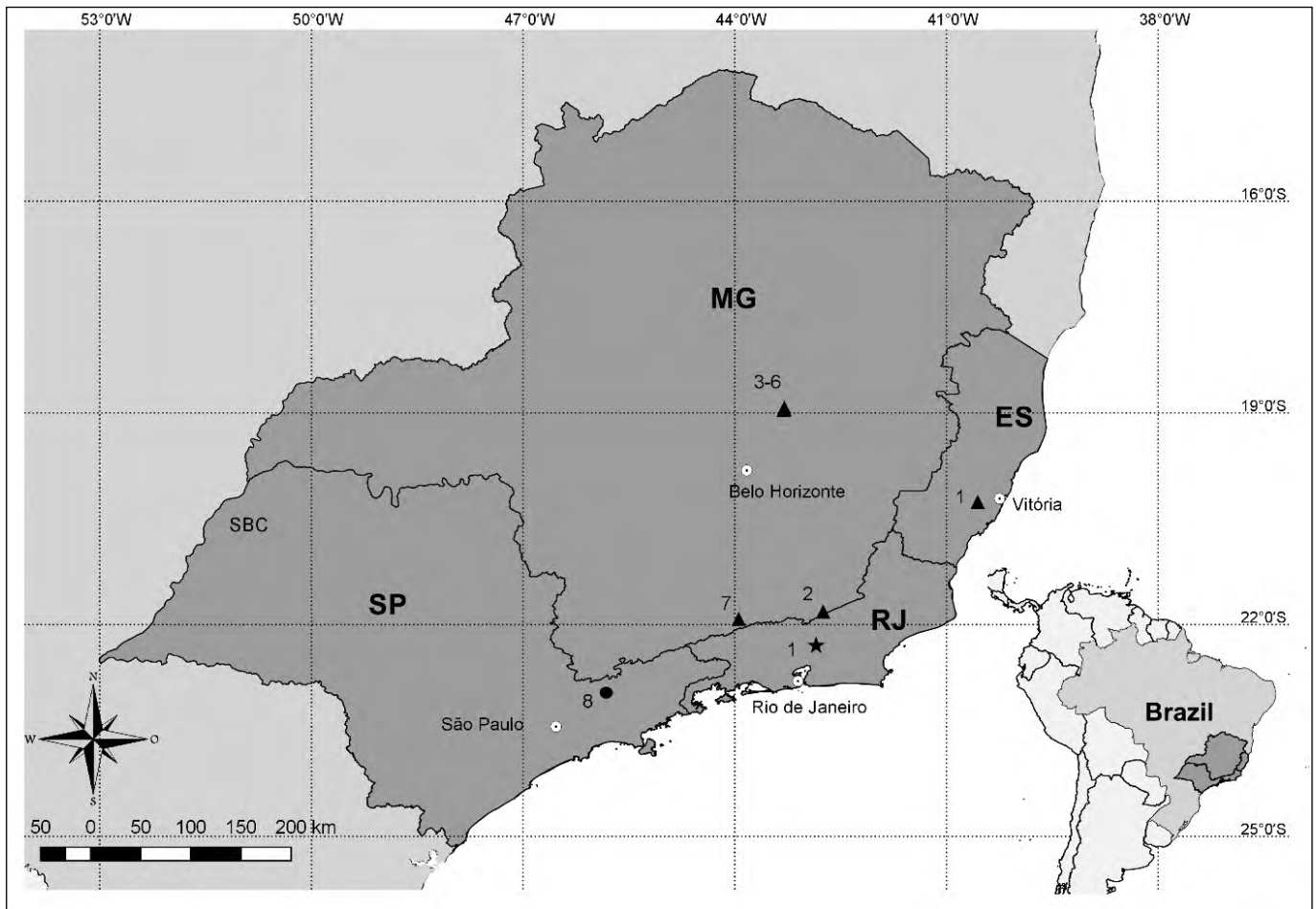
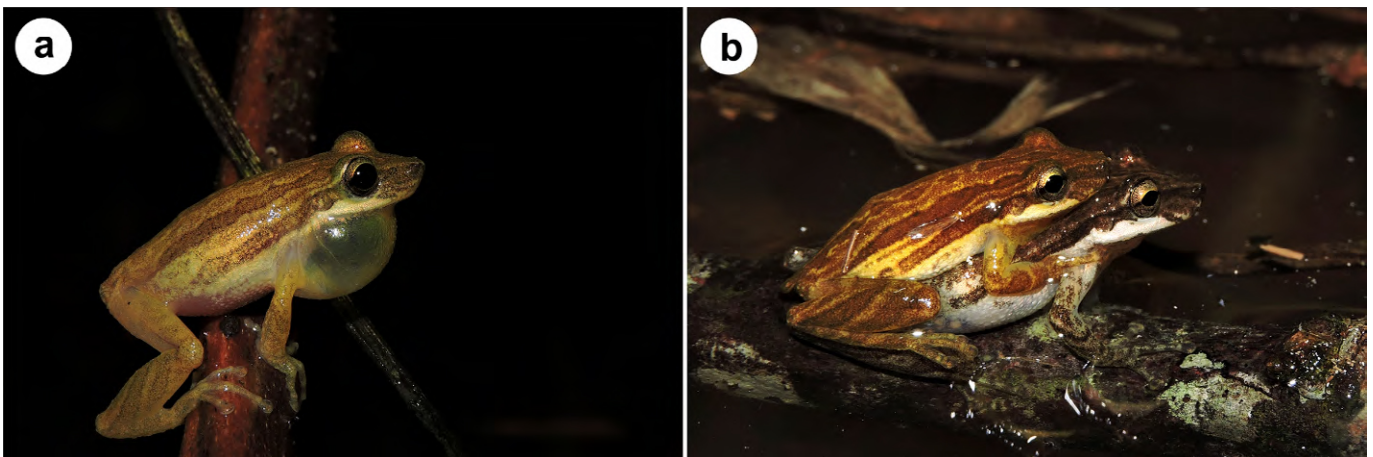


Figure 1. Distribution map of known localities for *Scinax cardosoi* based on the literature and the present records. Black star is type locality (CARVALHO-E-SILVA & PEIXOTO 1991). Black triangles are previous records: 1) CARVALHO-E-SILVA & PEIXOTO 1991 (20°21'50" S, 040°39'34" W), 2) Carvalho et al. 2015 (21°55' S, 042°51' W), 3–6) LINARES et al., 2011 (19°03'01" S, 043°23'57" W; 19°01'39" S, 043°24'03" W; 19°03'46" S, 043°24'45" W; 19°03'48" S, 043°24'21" W), 7) PINTO et al. 2009 (22°01'15" S, 044°02'51" W). 8) Black dot is the new record, Parque Natural Municipal Augusto Ruschi (23°04'00" S, 045°55'59" W, and 23°04'00" S, 045°55'00" W), São José dos Campos, São Paulo state, Brazil. Datum: WGS84.



Figures 2. *Scinax cardosoi*, Parque Natural Municipal Augusto Ruschi (PNMAR), São José dos Campos, São Paulo state, Brazil. **A.** Male in lateral view. **B.** Couple in amplexus, lateral view, showing pattern of transverse dark bars on the dorsal surface of limbs and longitudinal dark stripes on the dorsal surface of body.

Jacutinga and Bom Jardim de Minas municipalities, Minas Gerais state; Figure 1, point 7). Our new record increases the diversity of amphibians known for the state of São Paulo (ARAÚJO et al. 2009; ROSSA-FERES et al. 2011) and shows the importance of this Atlantic Forest fragment

for amphibian conservation in the PNMAR (MOROTI et al. 2016). Our record also highlights that even areas with isolated fragments of Atlantic Forest, proximal to well-studied regions, may contain important new records or even undescribed species.

ACKNOWLEDGEMENTS

We thank the Environmental Secretary of São José dos Campos and SISBio for the license granted for research at the conservation unit, and CNPq for financial support and Scientific Initiation for accomplishment of this work (124633/2015-3). We also thank the Institute Boitatá for the partnership through the “Amplexus Project”, as well as João Victor Lacerda for the comments on the draft and confirmation of the species, Mariana Pedrozo, Yasmin R.F. Cabedo, Hannah Lois Doerrier and to anonymous reviewers for proofreading, suggestions and review of the manuscript.

LITERATURE CITED

- ARAÚJO, O.G.D.S., L.F. TOLEDO, P.C.A. GARCIA & C.F.B. HADDAD. 2009. The amphibians of São Paulo state, Brazil amphibians of São Paulo. *Biota Neotropica* 9(4): 197–209. doi: <http://doi.org/fhbf4d>
- BRASIL. 2014. Portaria n° 444, de 17 de dezembro de 2014. Lista nacional oficial de espécies da fauna ameaçadas de extinção. Brasília: Publicado no Diário Oficial da União, em 17 de dezembro de 2014.
- CARVALHO T.R. DE, L.B. MARTINS & A.A. GIARETTA. 2015. The complex vocalization of *Scinax cardosoi* (Anura: Hylidae), with comments on advertisement calls in the *S. ruber* clade. *Phyllomedita* 14(2): 127–137. doi: <http://doi.org/bxht>
- CARVALHO-E-SILVA, S.P. & O.L. PEIXOTO. 1991. Duas novas espécies de *Oloolygon* para os estados do Rio de Janeiro e Espírito Santo (Amphibia, Anura, Hylidae). *Revista Brasileira de Biologia* 51(1): 263–270.
- CARVALHO-E-SILVA, S.P. & U. CARAMASCHI. 2004. *Scinax cardosoi*. The IUCN Red List of threatened species. Version 2010.2. Accessed at <http://www.iucnredlist.org>, 18 May 2016.
- DUELLMAN, W.E., A.B. MARION & S.B. HEDGES. 2016. Phylogenetics, classification, and biogeography of the treefrogs (Amphibia: Anura: Arboranae). *Zootaxa* 4104(1): 001–109. doi: <http://doi.org/bxhv>
- FAIVOVICH, J., P.C.A. GARCIA, C.F.B. HADDAD, D.R. FROST, J.A. CAMPBELL & W.C. WHEELER. 2005. Systematic review of the frog family Hylidae, with special reference to Hylinae: phylogenetic analysis and taxonomic revision. *Bulletin of the American Museum of Natural History* 294: 1–240. doi: [10.5531/sd.sp.12](https://doi.org/10.5531/sd.sp.12)
- FROST, D.R. 2016. Amphibian species of the world: an online reference. Version 6.0. Accessed at <http://research.amnh.org/herpetology/amphibia/index.html>, 18 May 2016.
- LINARES, A. M., M.H.O. BATEMARQUE, H.E.S. MELLO & L.B. NASCIMENTO. 2011. Amphibia, Anura, Hylidae, *Scinax cardosoi* (Carvalho-e-Silva and Peixoto, 1991): distribution extension. *Check List* 7(4): 407–408. doi: [10.15560/7.4.407](https://doi.org/10.15560/7.4.407)
- MOROTI, M.T., M. PEDROZO, I.F. MACHADO & D.J. SANTANA. 2016. Distribution extension of *Chiasmocleis mantiqueira* Cruz, Feio and Cassini, 2007 (Anura, Microhylidae). *Herpetology Notes* 9: 229–231. <http://www.biotaxa.org/hn/article/view/22589>
- PINTO, F.C.S., R.A.R. CAMPOS, F.S. BRAGA, F.N.S. QUEIRÓS & L.B. NASCIMENTO. 2009. Amphibia, Anura, Hylidae, *Scinax cardosoi* Carvalho-e-Silva and Peixoto, 1991: distribution extension and new state records. *Check List* 5(4): 866–868. doi: [10.15560/5.4.866](https://doi.org/10.15560/5.4.866)
- ROSSA-FERES D.C., R.J. SAWAYA, J. FAIVOVICH, J.G.R. GIOVANELLI, C.A. BRASILEIRO, et al. 2011. Anfíbios do Estado de São Paulo, Brasil: conhecimento atual e perspectivas. *Biota Neotropica* 11: 1–20. <http://www.biotaneotropica.org.br/v11n1a/en/abstract?inventory+bn0041101a2011>
- SOS MATA ATLANTICA & INPE (INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS). 2016. Atlas dos remanescentes florestais da Mata Atlântica período 2014-2015. São José dos Campos: INPE. 70 pp.

Authors' contributions: MTM, JAFN, ACS and IFM reviewed the specimens and collected the data. MTM and IFM wrote the manuscript. MTM, ACS and IFM produced the map and prepared the figures. MTM, JAFN, ACS, CPS and IFM reviewed the manuscript.

Received: 21 May 2016

Accepted: 17 December 2016

Academic editor: Tiago Vasconcelos