Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 13 (6): 747–750
https://doi.org/10.15560/13.6.747

PENSOFT

First record of *Rhinella poeppigii* (Tschudi, 1845) in Brazil (Anura, Bufonidae)

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Abstract

Rhinella poeppigii, member of the *Rhinella marina* group, which currently consists of 11 species, inhabits primarily cloud forests in the central Andes of Peru, Ecuador, and Bolivia, reaching lowlands adjacent to the Andes, at elevations of 260–1800 m. This work presents the first record of *R. poeppigii* in Brazil, from the municipality of Assis Brasil, in the state of Acre. This record extends the distribution of the species 242 km northeast of the nearest record in Explorer's Inn, Madre de Dios province, Peru.

Key words

Acre; Amazon Rainforest; geographic distribution.

Academic editor: Thiago R. de Carvalho | Received 7 September 2016 | Accepted 26 September 2017 | Published 10 November 2017

Citation: Venâncio NM, Freitas MA, Abegg AD, Kokubum MNC (2017) First record of *Rhinella poeppigii* (Tschudi, 1845) in Brazil (Anura, Bufonidae). Check List 13 (6): 747–750. https://doi.org/10.15560/13.6.747

Introduction

The genus *Rhinella* Fitzinger, 1826 comprises 93 species distributed throughout North, Central, and South America (Frost 2017). *Rhinella poeppigii* (Tschudi, 1845) belongs to the the *Rhinella marina* group which currently consists of 11 species: *R. marina* (Linnaeus, 1758); *Rhinella cerradensis* Maciel, Brandão, Campos & Sebben, 2007; *Rhinella horribilis* (Wiegmann, 1833); *R. icterica* (Spix, 1824); *R. poeppigii*; *R. arenarum* (Hensel, 1867); *R. schneideri* (Werner, 1894); *R. rubescens* (A. Lutz, 1925); *R. jimi* (Stevaux, 2002); *R. achavali* (Maneyro, Arrieta & de Sá, 2004); and *R. veredas* (Brandão, Maciel & Sebben, 2007) (Frost 2017). *Rhinella poeppigii* is known to occur in Peru, Bolivia, and Ecuador at elevations between 260 and 1800 m (De la Riva 2002, Venegas and Ron 2014, Frost 2017).

Herein, we provide the first record of *R. poeppigii* in Brazil. This new record is from Estação Ecológica Rio Acre (ESEC Rio Acre), in the municipality of Assis Brasil, state of Acre, northern Brazil.

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Figure 1. *Rhinella poeppigii* and *R. marina,* municipality of Assis Brasil, Acre, Brazil. **A, B.** Dorsal and ventral views of *R. poeppigii* (male). **C, D.** Dorsal and ventral views of *R. marina* (male).

Methods

During fieldwork at Estação Ecológica Rio Acre (ESEC Rio Acre; –11.0494, –070.2156, datum SAD69), 12–24 April 2014, several individuals of *R. poeppigii* were found calling from the margins of the Acre River during the day. In the first 20 minutes of this observation, 55 individuals of *R. poeppigii* were visually counted. Although most were found calling from the river margins, only 3 individuals were recorded in pitfall traps, which were located inside the forest 200 m from the river bank. The ESEC is located 70 km from the central point of Assis Brasil, where *R. marina* is also found. Six individuals of *R. poeppigii* were collected (collection permit #48448-1 SISBIO/ICMBio) and deposited in the herpetological collection of Universidade Federal do Acre (CHUFAC), accession numbers CHUFAC 6361–6366. Measurements for body size (SVL) were taken with calipers to the nearest 0.1 mm.

The advertisement call (N = 1 male; 2 calls analyzed) was recorded on 30 January 2010 using a Tascam digital recorder DR40 and a Yoga HT81® directional microphone, positioned at 40–50 cm from the male. Air temperature was 27 °C and the humidity was 89%. The sound file (MNCK00439_Rhinellapoeppiggi_Advertisementcall_AC_1) is deposited in the MNCK collection of the Herpetology Laboratory at Universidade Federal de Campina, Patos municipality, state of Paraíba, Brazil. Calls were analyzed and figured in Soundruler (Gridi-Papp 2007). Sampling rate was set at 16000 Hz, and resolution at 16 bits. Settings were: Fast Fourier Transform (FFT) at 256 points, Hanning window, overlap 0.9, and frequency resolution 21.5 Hz. The dominant frequency (Hz), call length (s), note length (ms), and call interval (ms) were analyzed. We follow the nomenclature of calls described for *Rhinella* species by several authors (São-Pedro et al. 2011, Morais et al. 2012, Carvalho et al. 2013), wherein the advertisement call was composed of a long trill or long sequence of notes and the notes of pulses. This nomenclature differs from that used by De la Riva et al. (1996) to the call description for *R. poeppigii*, in which these authors used the terms call, pulse group, and pulses, respectively. For comparison purposes, we also analyzed calls of *R. marina*, based on the repository accessed at (https://ppbio.inpa.gov.br/sites/default/files/Bufo%20marinus.wav) from Manaus, Amazonas, Brazil (Lima et al. 2012).

Results

Rhinella poeppigii (Fig. 1A, B) is one of the earliest-described members of the *R. marina* species group with a problematic taxonomic history and geographic distribu-

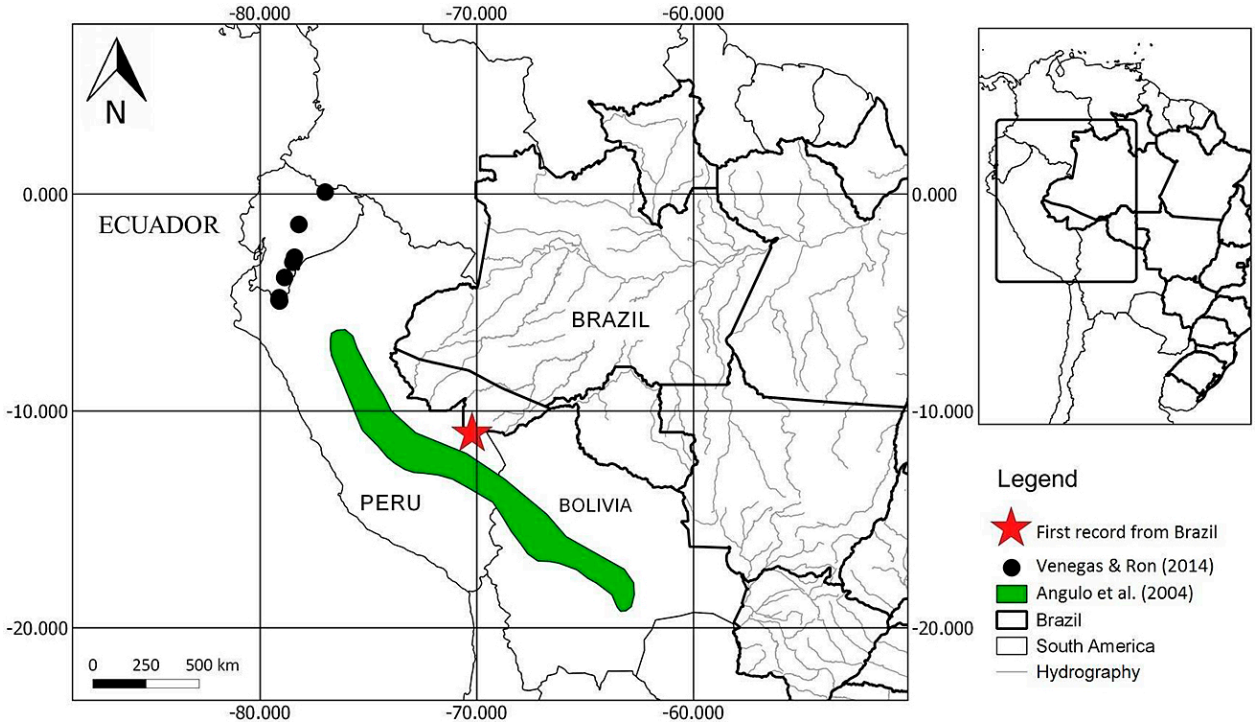

Figure 2. Distribution of *Rhinella poeppigii*, and the first record in Brazil, at Estação Ecológica Rio Acre (ESEC Rio Acre), municipality of Assis Brazil, Acre, Brazil.

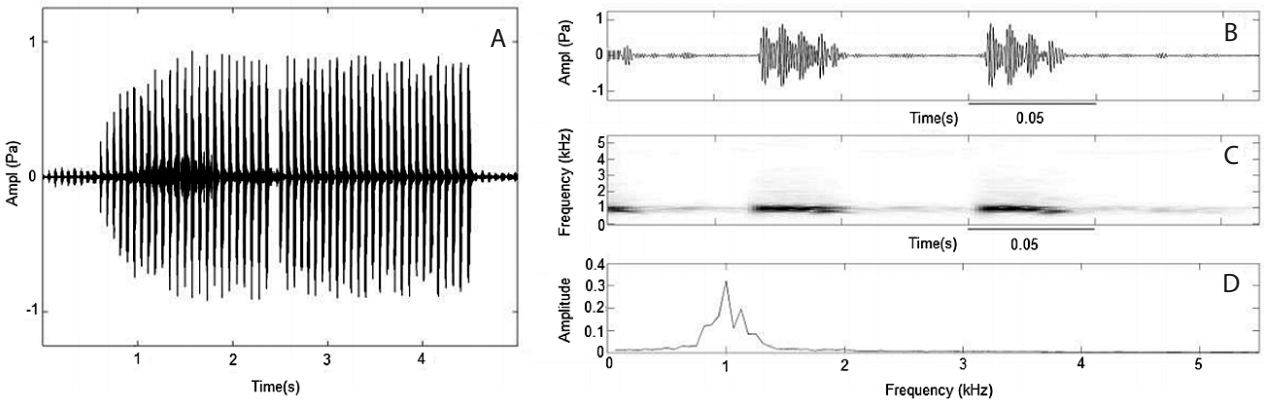

Figure 3. Advertisement call of *Rhinella poeppigii* from ESEC-Rio Acre, Assis Brasil (state of Acre), Brazil. Oscillogram of 1 call containing 54 notes (**A**), oscillogram (**B**), spectrogram (**C**) and amplitude spectrum (**D**) of 2 notes with 5 and 4 pulses.

tion (De la Riva 2002, Fig. 2). De la Riva (2002) published the last and more comprehensive taxonomic review of *R. poeppigii*. This species differs from Amazonian populations of *R. marina* (in parenthesis) (Fig. 1C, D) by the following characteristics (sensu De la Riva 2002): [1] males have rough skin, with a large number of similar sized tubercles, covered by keratinized spicules, and a higher concentration of tubercles in the sacral region (skin texture variable in tubercle quantity, size, and arrangement); [2] flattened, not hypertrophied, parotoid glands (protruding parotoids, often hypertrophied); [3] males bearing extensive nuptial excrescences on fingers I–III (nuptial excrescences normally present on finger I only and, if present on the other fingers, poorly developed); [4] females often have black spots, without definite shape (females with large, well defined, black blotches); and [5] cream-colored, immaculate belly (cream-colored, and usually marbled gray belly).

The snout-vent length (SVL) of the specimens from Acre (x = 84.8, SD = 34.6; N = 10), is close to the maximum SVL reported by De la Riva (2002), with the largest female having 132 mm in SVL, and the largest male, 112 mm in SVL, while the sympatric species *R. marina*, is much larger, attaining 240 mm in SVL (De la Riva 2002).

The advertisement call (mean ± SD) of *R. poeppigii* (Fig. 3), based on 2 calls of 1 male, consists of a long trill composed of 40–59 notes (51.8 ± 8.8; N = 2), with call length from 3.95–4.11 s (4.04 ± 1.14; N = 2), and the dominant frequency from 968–1031 Hz (999.5 ± 44.6; N = 2), respectively. The note length is 28–57 ms (47.5 ± 6.5; N = 30) and the note interval is 14–38 ms (27.4 ± 5.5; N = 29). Notes have 3–5 pulses (3.5 ± 0.6; N = 10).

Table 1. Comparison of the advertisement calls of *Rhinella poeppigii* from ESEC Rio Acre, Acre, Brazil (the present study), and from Bulo-Bulo, Bolivia (De la Riva et al. 1996); and *Rhinella marina* from Manaus, Amazonas, Brazil, and from Tambopata, Peru (Cocroft et al. 2001). Sample sizes given as males recorded/calls analyzed. NI = sample size unknown.

Parameters	*R. poeppigii* (Acre, Brazil) 1/2	*R. poeppigii* (Bulo-Bulo, Bolivia) 1/19	*R. marina* (Manaus, Brazil) NI	*R. marina* (Tambopata, Peru) NI
Notes per call	40–59	10–45	163	19–45
Dominant frequency (Hz)	968–1031	750–1500	626	1120
Call length (s)	3.95–4.11	0.63–2.68	8.42	—
Note length (ms)	28–57	—	25–33	—
Note interval (ms)	14–38	—	27–33	—
Pulses per note	3–5	3–5	3	5

Discussion

The parameters (dominant frequency and number of notes/call) of the individual from ESEC Rio Acre are similar to those of the unique advertisement call described for this species in the recorded literature for Bulo-Bulo, Province Carrasco, Department of Santa Cruz, Bolivia (De la Riva et al. 1996) (Table 1).

This is the first record of *R. poeppigii* in Brazil, which extends the distribution of the species by 242 km northeast from Explorer's Inn, Madre de Dios province, Peru (von May et al. 2009). New distributional records are essential to understand the actual local and regional diversity and conservation status of amphibian species. In some Brazilian localities, information on distribution is scarce (Azevedo-Ramos and Galatti 2002), highlighting the importance of biological inventories especially in the Amazon Rainforest, the biome that shelters the highest biodiversity levels on Earth.

Acknowledgements

We thank the managers of the Estação Ecológica Rio Acre in Assis Brazil for funding the field research, particularly Lincoln Schwarzbach, Adalucia de Carvalho, and Anselmo Silva. We also thank the reviewers and the academic editor for valuable suggestions and critical reading; the latest versions of the manuscript were substantially improved in part because of their contributions.

Authors' Contributions

NMV: field collection and text. MAF: field collection and text. MNCK: vocalization analyses and text. ADA: text.

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