



<http://dx.doi.org/10.11646/zootaxa.3931.3.10>

<http://zoobank.org/urn:lsid:zoobank.org:pub:DB46AB26-7130-4994-87EF-7C1CA7025356>

Advertisement call of *Rhinella inopina* Vaz-Silva, Valdujo & Pombal, 2012 (Anura: Bufonidae) from the type-locality, northeastern Goiás State, Central Brazil

SHEILA PEREIRA DE ANDRADE¹, CEZAR FILHO ROCHA¹, EDMAR PEREIRA VICTOR-JUNIOR¹
& WILIAN VAZ-SILVA^{1,2}

¹Centro Tecnológico de Engenharia, Ltda., Rua 254, 146, Setor Coimbra, 74.535-440, Goiânia, GO, Brazil

²Pontifícia Universidade Católica de Goiás - PUC Goiás, Departamento de Biologia. Programa de Pós-Graduação em Ciências Ambientais e Saúde. Rua 235, n. 40, Bloco L, Setor Universitário, 74.605-010, Goiânia, GO, Brazil

The *Rhinella crucifer* species group currently comprises six species of toads: *R. abei* (Baldissera, Caramaschi & Haddad, 2004); *R. crucifer* (Wied-Neuwied, 1821); *R. henseli* (A. Lutz, 1934); *R. ornata* (Spix, 1824); *R. pombali* (Baldissera, Caramaschi & Haddad, 2004); and, *R. inopina* Vaz-Silva, Valdujo & Pombal, 2012. Recent genetic studies suggest five species in the *R. crucifer* species group and show evidence of hybridization between *R. crucifer* and *R. ornata* (Thomé *et al.* 2012).

With an extensive geographical distribution (Thomé *et al.* 2012; Frost, 2014), the species of *Rhinella crucifer* group occur in the Atlantic rainforest, Cerrado and transitional areas between these domains (Baldissera *et al.* 2004; Thomé *et al.* 2010; Arruda *et al.* 2014). *Rhinella inopina* (Fig. 1A) was recently described, occurring in Seasonal Tropical Dry Forests enclaves of the northeastern of Cerrado domain within the limits of the States of Goiás, Tocantins and Bahia in Brazil. More recently this species was recorded in the northwest Minas Gerais state, in Parque Nacional Cavernas do Peruaçu, municipality of Januária and in the Área de Proteção Ambiental do Rio Pandeiros, municipality of Bonito de Minas, both inside the Cerrado biome (Arruda *et al.* 2014). Information on advertisement calls is available for *R. ornata*, *R. pombali*, and *R. crucifer* (Heyer *et al.* 1990, where the call described as *Bufo crucifer* represents *R. ornata*; Lourenço *et al.* 2010; Oliveira *et al.* 2014). Herein we describe the advertisement call of *R. inopina*, recorded at its type-locality in the municipality of São Domingos, State of Goiás, Brazil.

On September 9, 2013, we recorded 39 calls, from two males calling at the edge of the Galheiros Hydroelectric Power Plant reservoir, near a remaining of Seasonal Tropical Dry Forest in the Cerrado biome at the São Domingos municipality, northeastern Goiás (13°23'30" S, 46°23'32" W). Males were found calling at night, above partly submerged leaves, trunks and also at the edge of the reservoir. We used a Marantz PMD 671 digital audio recorder set at 44.1 kHz sample rate and 16 bits resolution coupled to a directional microphone Sennheiser ME66/K6. Call editing and analysis were performed using Sound Ruler 0.9.6.0 (Gridi-Papp, 2007) for frequency analysis and to generate figures of oscillograms and audiospectrograms at Hanning window type, 256 FFT length and an overlap of 0.9 between FFTs. We measured temporal parameters manually, using Adobe Audition CS6. All measurements are given as mean ± SD (standard deviation), followed by range in parentheses. Terminology of temporal and acoustic parameters follows Heyer *et al.* (1990). Voucher specimens are deposited at the Zoological Collection of the Universidade Federal de Goiás (ZUFG), Goiânia, state of Goiás, Brazil (ZUFG 7959-7960).

The advertisement call of *Rhinella inopina* (Figure 1B, 1C) consists by a series of pulsed notes. The mean call duration was 3.40 ± 0.87 s (1.31–4.80 s; N = 39), and call interval was 6.12 ± 3.76 s (0.21–15.88 s; N = 34). The number of notes per call was 62 ± 18 notes (23–89; N = 39), with mean duration 0.019 ± 0.003 s (0.013–0.025 s; N = 1562), and mean interval of 0.036 ± 0.003 s (0.033–0.043 s; N = 1482). The dominant frequency was 1.070 ± 0.03 kHz (0.940–1.100 kHz; N = 38). The number of pulses per note ranged from 1 to 3 and note rate was 16–21 notes per second.

Within the *Rhinella crucifer* species group, the advertisement call of *R. inopina* is more similar to that of *R. crucifer* given that some acoustic parameters in the two species overlap: number of notes per call (*R. inopina* 23–89; *R. crucifer* 31–104); number of pulses per note (*R. inopina* 1–3; *R. crucifer* 1–5); call duration (*R. inopina* 1.31–4.80s; *R. crucifer* 1.47–5.53 s); duration of notes (*R. inopina* 0.013–0.025 s; *R. crucifer* 0.017–0.036 s) and the note rate (*R. inopina* 16–21 notes per second; *R. crucifer* 17–25 notes per second). The difference between them is the dominant frequency that is higher in *R. inopina* (0.940–1.100 kHz) than that of *R. crucifer* (0.750–0.937 kHz) (Oliveira *et al.* 2014).

References

- Arruda, L.F., Peixoto, M.A.A., Guimarães, C.S., Lacerda, J.V.A. & Feio, R.N. (2014) New state record and geographic distribution map of *Rhinella inopina* Vaz-Silva, Valdujo & Pombal, 2012 (Anura: Bufonidae). *Check List*, 10 (2), 395–396.
<http://dx.doi.org/10.15560/10.2.395>
- Baldissera, F.A.B., Caramaschi, U. & Haddad, C.F.B. (2004) Review of the *Bufo crucifer* species group, with descriptions of two new related species (Amphibia, Anura, Bufonidae). *Arquivos do Museu Nacional*, 62, 255–282.
- Frost, D.R. (2014) Amphibian Species of the World: an Online Reference. Version 6 (18 May 2014). American Museum of Natural History, New York, USA. Electronic Database. Available from: <http://research.amnh.org/herpetology/amphibia/index.html> (accessed 24 February 2015)
- Gridi-Papp, M. (2007) Sound Ruler acoustic analysis. Version. 0.9.6.0. (21 August 2013) Available from: <http://soundruler.sourceforge.net> (accessed 24 February 2015)
- Heyer, W.R., Rand, A.S., Cruz, C.A.G., Peixoto, O.L. & Nelson, C.E. (1990) Frogs of Boracéia. *Arquivos de Zoologia*, 31, 231–410.
- Lourenço, A.C.C., Baêta, D., Abreu, A.C.L. & Pombal, J.P. Jr. (2010) Tadpole and advertisement call of *Rhinella pombali* (Baldissera, Caramaschi & Haddad, 2004) (Amphibia, Anura, Bufonidae). *Zootaxa*, 2370, 65–68.
- Oliveira, R.M., Ruas, D.S., Mendes, C.V.M. & Solé, M. (2014) Advertisement call of *Rhinella crucifer* (Wied-Neuwied, 1821) (Anura: Bufonidae) from southern Bahia, Brazil. *Zootaxa*, 3784 (1), 97–98.
<http://dx.doi.org/10.11646/zootaxa.3784.1.9>
- Vaz-Silva, W., Valdujo, P.H. & Pombal, J.P. (2012) New species of the *Rhinella crucifer* group (Anura, Bufonidae) from the Brazilian Cerrado. *Zootaxa*, 3265, 57–65.
- Thomé, M.T.C., Zamudio, K.R., Giovanelli, J.G.R., Haddad, C.F.B., Baldissera, F.A. Jr. & Alexandrino, J. (2010) Phylogeography of endemic toads and post-Pliocene persistence of the Brazilian Atlantic Forest. *Molecular Phylogenetics and Evolution*, 55 (3), 1018–1031.
<http://dx.doi.org/10.1016/j.ympev.2010.02.003>
- Thomé, M.T.C., Zamudio, K.R., Haddad, C.F. & Alexandrino, J. (2012) Delimiting genetic units in Neotropical toads under incomplete lineage sorting and hybridization. *BMC Evolutionary Biology*, 12, 242.
<http://dx.doi.org/10.1186/1471-2148-12-242>