Herpetology Notes, volume 3: 037-039 (2010) (published online on 1 February 2010)

Distress call of a female *Hypsiboas albomarginatus* (Anura, Hylidae)

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Abstract. This paper describes the distress call of a female *Hypsiboas albomarginatus*, collected at Restinga de Iquiparí, São João da Barra municipality, Rio de Janeiro state, Brazil. The vocalization was performed with the mouth closed and is composed of a single, unpulsed, harmonic note. This call is similar to other distress calls known for other species of the same genus and for other Brazilian anuran species.

Keywords. Vocalization, distress call, defensive behavior, Amphibia, Brazilian Restinga habitat.

The study of amphibian vocalizations started at the end of the 1950's arguing the matter of this behavior on specific recognizing and home range maintenance (Martof, 1953; Bogert, 1960; Cardoso and Vielliard, 1989). Vocalizations are the most frequent form of communication in anurans, where unique vocalizations are emitted in response to different kinds of ecological interactions (Giasson and Haddad, 2006). Distinct types of calls can be observed in amphibian species, such as advertisement calls, aggressive calls, distress calls and mixed calls (e.g., Bogert, 1960; Narins et al., 2000; Lingnau et al., 2004).

The distress call can be distinguished from the other vocalizations, being characterized by loud and explosive notes, discharged usually on replying to disturbances or potential predators (Duellman and Trueb, 1994). Furthermore, it can be emitted not only by males, but also by females and juveniles (e.g., Hödl and Gollmann, 1986; Franzen and Glaw, 1999; Toledo et al., 2005). Few reports related to distress calls are available in the literature, and there is a lack of information about this kind of calls on amphibians in the Neotropical region (see Toledo and Haddad, 2009).

Hypsiboas albomarginatus is a medium-sized hylid frog, occurring in the Caribbean lowlands of Colombia and the Guianas, the lower Amazon Basin and Atlantic forests of eastern Brazil, from the state of Pernambuco to the state of Santa Catarina (Frost, 2009). Toledo and Haddad (2009) described the distress call of this species, however, only the call of males was described. This paper presents the description of the distress call of a female *Hypsiboas albomarginatus*, with comments on this behavior and comparisons between the calls.

Hypsiboas albomarginatus individuals called on 03 February 2009 from marginal vegetation nearby a semi-permanent puddle at Restinga de Iquiparí (21°44'09" S, 41°01'45" W; at sea level), São João da Barra municipality, Rio de Janeiro state, Brazil. A female of *Hypsiboas albomarginatus* (specimen nº MZUFV 9721, SLV= 53.5 mm – Fig. 1) produced a strong explosive call when captured, interpreted by us as a distress call. The distress calls were recorded using a Sony ICD-P630F digital recorder (with approximately 120° on directive angle, at a distance of ca. 30 cm), producing a *.wav file on High Quality recording mode (with capacity of recording frequency between 0.220 and 6.800 kHz). The voucher specimen was collected and is housed at the Coleção Herpetológica do Museu de Zoologia João Moojen (MZUFV), Universidade Federal de Viçosa, Viçosa municipality, Minas Gerais state, southeastern Brazil.

The calls were analyzed on AVISOFT-SASLab Light for Windows, version 3.74, and SoundRuler Version 0.9.4.1, where audiospectrograms were produced according to the following parameters: FFT = 256, Frame = 100, Overlap = 75 and flap top filter. The spectrogram, oscillogram and power spectrum were performed in SoundRuler Version 0.9.4.1. The technical terms used in this work were adapted from those used in

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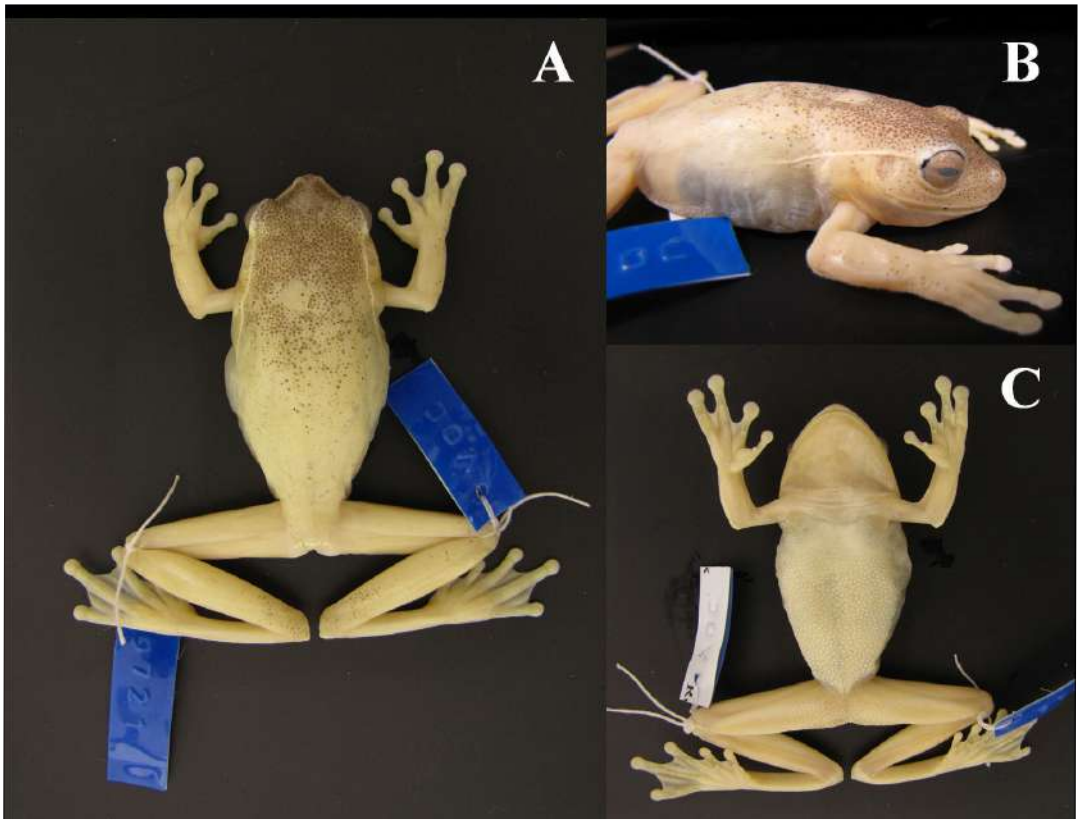

Figure 1. Female *Hypsiboas albomarginatus* (voucher specimen nº MZUFV 9721, SLV= 53.5 mm). (A) dorsal; (B) lateral and (C) ventral view.

Duellman and Trueb (1994), Tárano (2001) and Orrico et al. (2006).

The call was emitted with the mouth closed, and is composed by a single, harmonic, unpulsed note with a duration of 0.01–0.47 s (mean ± SD = 0.14 ± 0.10 s, n=46). Fundamental frequency was 0.646 – 1.39 kHz (mean ± SD = 0.873 ± 0.170 kHz, n=46) and dominant frequency was 1.29 – 2.78 kHz (mean ± SD = 1.74 ± 0.34 kHz, n=46), on the second or third harmonic. Intervals between calls have a duration of 0.01–2.18 s (mean ± SD = 0.5 ± 0.43 s, n=46) (Fig. 2).

These results provide some differences when compared with that published by Toledo and Haddad (2009), who found a modulated call with higher frequencies and no harmonic bands on the central portion of the calls. Moreover, pulsed distress calls were not observed in the present study. Other difference observed between both calls was the calls duration, which in our female (mean = 0.14s) shows shorter duration than that observed for male distress calls (mean = 0.39s) in *H. albomarginatus*. Moreover, dominant frequency is 1.74 kHz for females, while the male calls have a mean dominant frequency of 3.54 kHz.

Toledo and Haddad (2009) reported differences among intra-specific distress calls of several anuran species, as did before by Hödl and Gollmann (1986). However, these differences are not as pronounced as those observed among advertisement calls of different species (see Toledo and Haddad, 2009). By analyzing the distress calls of male, female and juveniles described for single species, it was shown that distress calls presents some differences even in the same species (e.g. Sazima, 1975; Hödl and Gollmann, 1986; Toledo and Haddad, 2009), like the results for *Hypsiboas albomarginatus* in the present work. This fact does not completely exclude the hypothesis that distress calls can be used for taxonomic and phylogenetic inferences (Toledo and Haddad, 2009), but combining this data set with other lines of evidence (e.g. tadpoles, morphology, advertisement calls, molecular genetics) is highly recommended to do sound interpretations.

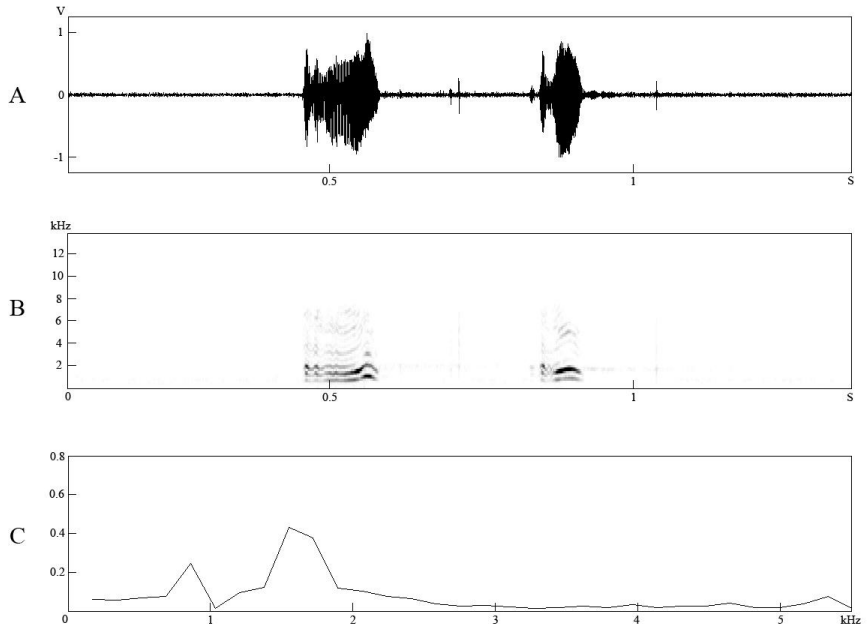

Figure 2. Distress call of *Hypsiboas albomarginatus*. (A) oscillogram; (B) audiospectrogram and (C) power spectrum (air temperature 27ºC).

Acknowledgements. We thank Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis (IBAMA) and Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) for capture permit and Museu de Zoologia João Moojen (MZUFV) for housing the voucher specimen.

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Accepted by Sebastian Steinfartz