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Bioacoustic data of the recently described *Boophis calcaratus* (Anura: Mantellidae: Boophinae), a cryptic treefrog from Eastern Madagascar

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The recent systematic classification of Malagasy amphibians by Glaw & Vences (2006) proposed a new monophyletic *Boophis* subgenus (*Sahona*), that includes the species formerly ascribed to the *B. tephraeomystax* group. This subgenus contains ten described species (Vallan *et al*. 2009), which show a rather cryptic colouration, sometimes reminding tree corks and lichens, as it is the case of *B. lichenoides*, *B. guibei*, and possibly also in *B. xerophilus* (Andreone 2002; Glaw & Vences 2007).

The most recently described species is *Boophis (Sahona) calcaratus* (Vallan *et al.* 2010) and it is rather similar in morphology to the other *Sahona* species, but it presents a small dermal tubercle on the heels. Individuals of this species are mainly nocturnal and live on forest edges or within degraded rainforests, usually sitting on branches and leaves 1.5-3 m high. However, as it is evident for many Malagasy frogs, the lack of knowledge and information on life history traits is still relevant. Particularly, vocalizations of *B. calcaratus* were unknown when the species was described (Glaw & Vences 2007; Vallan *et al*. 2010). To fill this gap, in this paper we describe the call repertoire of this treefrog.

We observed and recorded individuals of *B. calcaratus* at Réserve Naturelle Intégrale de Betampona, a low-altitude rainforest in eastern Madagascar (ANGAP, 2003). This is a new finding, and it is the third known locality of this species and thus represents an extension of the known distribution area. A photograph of an individual was already given by Andreone & Randriamahazo (2008) under the name *Boophis* sp. (aff. *calcaratus*). Its taxonomic identity was confirmed by analysis of external morphology and by the comparison of a fragment of 500 bp of the 16S rRNA gene, the standard DNA barcoding marker for amphibians (Vences *et al*. 2005). To sequence the fragment we used standardized cycling protocols and primers (Vences *et al*. 2000). DNA sequences were submitted to Genbank (accession number: GU371304; accession number of comparative adult specimen is FJ559134, corresponding to the paratype from Ambavaniasy).
The individuals were found on the occasion of a survey work carried out at Betampona from October to December 2007. They were rather abundant close to Rendrirendry Village (17º55'51,8" S - 049º12'09,0" E; altitude of about 325 m a.s.l.) next to a pond and swampy area, surrounded by secondary vegetation.

Males started vocalisations at the sunset, and were heard during the night from branches and leaves up to at least 2 m high, or even on the ground, near ponds and slow moving streams. The calls here presented were recorded on 2 November and 2 December 2007, respectively at 20:15 h and 20:00 h, at an air temperature of 20ºC and 23ºC. *Boophis calcaratus* individuals were found in syntopy with *Heterixalus madagascariensis*, *H. punctatus*, *Blommersia* sp. aff. *blommersae*, *Boophis tephraeomystax*, *Guibemantis timidus*, *Mantidactylus* sp. aff. *betsileanus*, *Plethodontohyla notosticta*, *Paradoxophyla palmata*, and *Ptychadena mascareniensis*.
Call recordings were made using a professional digital recorder (Marantz PMD 660), accessorized with a semi-directional microphone. Calls were analysed with the acoustic software Adobe Audition 3.0 (Andreone *et al*., 2002; Vences *et al*., 2004). All the calls were edited with a sampling rate of 44.100 Hz and 16 bits per sample in the mono pattern and in "Waveform" extension. Frequency information was obtained through Fast Fourier Transformation (FFT, width 1024 points); the audiospectrogram was obtained at Hanning window function with 256 bands resolution. Temporal measurements are provided as range, followed by mean, standard deviation and number of analysed units (n): analysed notes, calls or intervals. After completion of call recordings the calling specimen was photographed (Fig. 1), captured, anaesthetized by immersion in MS222 and preserved in 75% ethanol, and later deposited in the collection of the Museo Regionale di Scienze Naturali di Torino, Italy (MRSN A6595) (Fig. 1).

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