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**The advertisement call of *Mantidactylus aerumnalis*
(Anura: Mantellidae), a terrestrial frog
from the east coast of Madagascar**

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The subgenus *Chonomantis* is a group of small to medium-sized terrestrial frogs (represented by eight described species) distinguished from other groups of the Mantellidae by their typical larval morphology (BLOMMERS-SCHLÖSSER 1979, GLAW & VENCES 2006, 2007). Since the original types of one species, *Mantidactylus aerumnalis*, were lost, ANDREONE & GAVETTI (1994) designated a neotype and redefined the species based on specimens collected at An'Ala. Only few data on the species' life history are available so far, mainly because individuals were usually found in small numbers. This was not the case for the Réserve Naturelle Intégrale de Betampona, where we conducted survey work in 2007. This 2228 ha fragment of untouched hilly primary forest is characterised by the presence of several streams that cross the reserve and a humid tropical climate (BRITT et al. 2004, GLESSNER & BRITT 2005). There, *M. aerumnalis* is locally rather abundant and easy to spot. This also allowed us to record the species' advertisement call. In fact, the species' acoustic repertoire was unknown until now. The vocalisations formerly attributed to this species by BLOMMERS-SCHLÖSSER & BLANC (1991) and GLAW & VENCES (1992, 1994) actually correspond to *Mantidactylus brevipalmatus* (VENCES & GLAW 2004). In order to clarify the situation, we describe in this paper the advertisement call of *M. aerumnalis*.

Betampona is a lowland rainforest located in eastern Madagascar (ANGAP 2003) and this locality also represents an addition to the species' known distribution range. According to VENCES & GLAW (2004) and updated by GLAW & VENCES (2007), *Mantidactylus aerumnalis* occurs from east-central to southeastern Madagascar, having been recorded from An'Ala, Ivohibe, Marovitsika, Midongy, Moramanga, Ranomafana (Imaloka, Mangevo, Ranomena), Tolongoina and Vondrozo.

Its taxonomic identity was preliminarily confirmed by analysis of external morphology and finally clarified by the

comparison of a 500 bp fragment of the 16S rRNA gene, the suggested 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). Identification was considered to be unequivocal when the blast result was 98–100% identical to a specimen assigned to the same species, and not more similar to a sequence from any other species. DNA sequences were submitted to Genbank (accession numbers: GU371301, GU371302 and GU371303).

At Betampona, individuals of *M. aerumnalis* were found at a site called Sahaïndrana, in the eastern part of the reserve (17°53'55,5" S, 49°12'02,4" E, 327 m a.s.l.), but also on the northern borders, and at a site known as Tolongoina (17°53'07,2" S, 49°12'35,9" E, 309 m a.s.l.); however, it was less commonly observed at the latter site (ROSA 2008). Males were heard mainly at dusk and nightfall, calling from the ground, near small slow-flowing streams. Individuals were found in syntopy with another *Chonomantis* species, *Mantidactylus* sp. aff. *albofrenatus* "Ampasimazava", but also with *Boophis rufiocularis*, *Boophis* sp. aff. *madagascariensis* "North", *Boophis pyrrhus*, *Boophis viridis*, *Blommersia* sp. aff. *blommersae* "Toamasina", *Guibemantis bicalcaratus*, *Guibemantis liber*, *Mantella ebenau*, *Mantidactylus betsileanus*, *Mantidactylus* sp. aff. *betsileanus* "Toamasina", *Mantidactylus* sp. aff. *tricinatus* "Sahavontsira", *Mantidactylus* sp. aff. *biporus* "Betampona" and *Stumpffia* sp. aff. *grandis* "Betampona".

Vocalisations were recorded using a professional digital recorder (Marantz PMD 660), accessorised with a semi-directional microphone. They were then analysed with the acoustic software Adobe Audition 3.0 (see VENCES et al. 2004). All the calls were resampled at 44.1 kHz and 16 bit resolution in the mono pattern and saved as uncompressed files. Frequency information was obtained through Fast Fourier Transformation (FFT, width 1024 points); the



Figure 1. Calling male of *Mantidactylus aerumnalis* (MRSN A6362), photographed at Betampona Strict Nature Reserve (Sahaïndrana site) on 14 November 2007.

audiospectrogram was obtained using a Hanning window function with 256-band resolution. Temporal measurements are given as range, followed by mean \pm standard deviation and number of analysed units (notes, calls or intervals).

The first call recording for this species was made on 14 November 2007, at 18:30 h, at 21°C air temperature. The calling male was photographed (Fig. 1) after call recordings, captured, euthanised by immersion in MS222, and preserved in 75% ethanol, and later deposited in the collection of the Museo Regionale di Scienze Naturali di Torino (MRSN A6362).

The call (Fig. 2) consists of a rapid series of 18–35 (25.7 ± 5.2 ; $n = 7$) inharmonious notes and lasts between 1330–2680 ms (1921 ± 438 ; $n = 7$). These unpulsed notes are very short, with a duration of 3–10 ms (6.7 ± 1.6 ; $n = 138$) and with a slightly melodious appearance. Duration of intervals between notes is 58–129 ms (69 ± 11 ; $n = 149$), although, it is possible to recognise a slightly longer interval between the first note and the subsequent notes of the series lasting 100–129 ms (114 ± 12 ; $n = 5$). Two note series are separated by 218 s ($n = 1$) and note repetition rate is 12.8–14.7/s. The frequency ranges from 1 to 4 kHz and maximum call energy is recognizable at around 1.4 kHz. The relative amplitude increases at the beginning of the call and decreases towards the last notes of the series.

The call of this species is overall similar to calls known from other species of the subgenus *Chonomantis* (compare VENCES & GLAW 2004), but differs in temporal structure, namely a higher number of notes per series and a shorter note duration. A more detailed comparison with *Mantidactylus brevipalmatus* calls (GLAW & VENCES 1994, VENCES & GLAW 2004) revealed some additional differences to those already mentioned above: two note types could be distinguished in *M. brevipalmatus* calls in contrast to a sin-

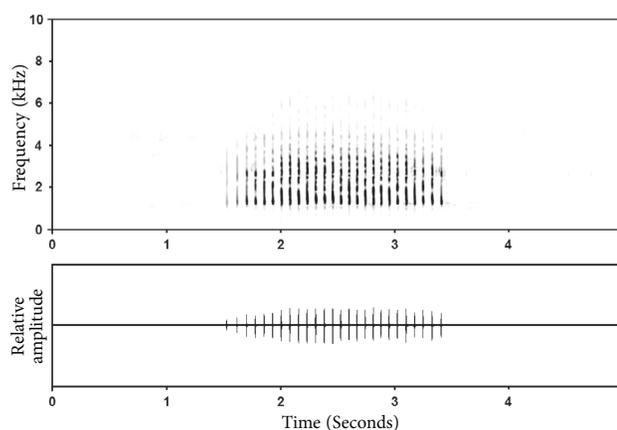


Figure 2. Audiospectrogram (top) and corresponding oscillogram (bottom) of the advertisement call of *Mantidactylus aerumnalis*. Recorded at Betampona Strict Nature Reserve on 14 November 2007 (18:30 h, 21°C).

gle note type in *M. aerumnalis* calls; notes in *M. brevipalmatus* calls are emitted within a rather similar frequency range, although the dominant frequency band of 2.20 to 2.75 kHz is significantly higher.

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