



## Description of the advertisement call of *Dendropsophus haddadi* (Bastos and Pombal 1996) (Anura: Hylidae) from southern Bahia, Brazil

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The *Dendropsophus decipiens* clade is part of the *Dendropsophus microcephalus* group, and currently comprises four species: *D. berthalutzae*, *D. decipiens*, *D. haddadi* and *D. oliveirai* (Faivovich *et al.* 2005; Frost 2011). According to Faivovich *et al.* (2005) the phenotypic synapomorphies of this clade are the oviposition on leaves overhanging water and the presence of a posterior row of marginal papillae in the tadpoles. *Dendropsophus haddadi* can be found in the Coastal Atlantic Rainforest, and in the scrubby "restinga" vegetation between eastern Espírito Santo and Pernambuco states (Bastos & Pombal 1996; Amorim *et al.* 2009).

Of the four species of the clade, only *D. decipiens* and *D. oliveirai* have the advertisement call described (Abrunhosa *et al.* 2001; Santana *et al.* 2011). Herein, we describe the advertisement call of *D. haddadi*.

Males of *D. haddadi* (Fig. 1A) were recorded at the "Reserva Ecológica da Michelin" (REM); 13°49'35" S, 39°08'32" W, municipality of Ituberá, and at the RPPN (Private Natural Heritage Reserve) "Serra Bonita"; 15°25'5" S, 39°32'45" W, municipality of Camacan.. Both areas are located in the south of the state of Bahia, Brazil. Voucher specimens were deposited at the zoological collection at Universidade Estadual de Santa Cruz, Ilhéus, Bahia (MZUESC 9585-9588 from REM; 10109-10110 from "Serra Bonita").

Calls were recorded with a Marantz PMD 660 digital audio recorder with an unidirectional Sennheiser ME45 microphone and a K6 power module. Calls were recorded at a resolution of 16 bit and 48 kHz sampling rate. Waveform and spectrogram were made using Raven Pro 1.4 and analyzed with a Fast Fourier Transformation of 256 points, 50% overlap for an entire call and Window Hamming. For all other configurations the "default" settings of Raven were used. Terminology follows Duellman and Trueb (1994).

Males were found calling on shrub vegetation on the edge of ponds, perched between 0.5 and 1.5m height. At REM we recorded 68 calls (Fig. 1B and C) of four males on August 16, 2011, between 20:00–22:00 h, air temperature of 18.8°C. The duration of the advertisement call was  $0.045 \pm 0.023$  s (0.011–0.097 s,  $n = 68$ ). It was formed of one to three multipulsed notes; note duration was  $0.012 \pm 0.005$  s (0.004–0.032 s,  $n = 126$ ). Each note had 1–8 pulses ( $\bar{x} = 3.02 \pm 1.41$  s,  $n = 126$ ); dominant frequency was  $4668 \pm 154$  Hz (4312–4875 Hz,  $n = 68$ ); pulse per second rate was  $261.41 \pm 67.22$  (117.64–421.05).

At "Serra Bonita" we recorded 18 calls (Fig. 1D and E) of two males on July 11, 2011, between 21:00–22:00 h, air temperature of 19.7°C. The call duration was  $0.089 \pm 0.010$  s (0.064–0.108 s,  $n = 18$ ). It was formed by two multipulsed notes; note duration was  $0.028 \pm 0.012$  s (0.012–0.059 s,  $n = 36$ ); number of pulses per note was 1–4 pulses ( $\bar{x} = 2.41 \pm 0.60$ ,  $n = 36$ ). The dominant frequency was  $4541 \pm 118$  Hz (4125–4687 Hz,  $n = 18$ ); pulse per second rate was  $89.25 \pm 16.80$  (60.24–116.27).

Calls from REM had shorter call and note duration; however they were emitted at a faster rate than those recorded in "Serra Bonita". Number of notes was greater in the calls from REM than in the calls from "Serra Bonita". These differences among the calls may be related to inter and intraspecific interactions, climate environmental conditions at time of recording, geographic variation or morphologically cryptic species (Hartmann *et al.* 2006; Schwartz & Wells 1984).

Summarizing all data the general mean duration of the advertisement call of *D. haddadi* was  $0.054 \pm 0.027$  (0.011–0.108,  $n = 86$ ) which is formed of one to three multipulsed notes; the duration of the notes is  $0.015 \pm 0.010$  s (0.004–0.059,  $n = 162$ ). Each note has 1–8 pulses ( $\bar{x} = 2.88 \pm 1.29$ ,  $n = 162$ ). The interval between the advertisement calls was  $33.73 \pm 18.01$  s (12.19–84.45,  $n = 48$ ). The dominant frequency was  $4644 \pm 155$  Hz (4312–4875 Hz,  $n = 86$ ); pulse per second rate was  $179.86 \pm 100.21$  (60.24–421.05).