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The advertisement call of *Haddadus aramunha* (Cassimiro, Verdade & Rodrigues, 2008) (Anura, Craugastoridae)

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The genus *Haddadus* currently consists of three species, after the recent transfer of *Strabomantis aramunha* to this genus (Amaro et al. 2013). In the original description the authors suggested *H. aramunha* may not vocalize (Cassimiro et al. 2008), a claim that was later refuted on the basis of field observations (Napoli et al. 2010). Herein we provide the first description of the advertisement call of *H. aramunha* along with some notes on its natural history.

We analyzed calls of five individuals from Chapada Diamantina National Park, Palmeiras Municipality, Bahia State, Brazil (12° 34' 10.3" S, 41° 29' 29.1" W; approximately 944 m. a. s. l) recorded on January 20–23, 2013 (from 19:15–20:40 h) with a Marantz® PMD 660 digital recorder with a sampling rate of 48 kHz and 16 bit resolution coupled to a Sennheizer® ME66 directional microphone. Voucher specimens were killed with 5% xylocain cream, individually tagged, preserved in formalin, and stored in 70% ethanol (collecting permits to AAG 37473-1) in Coleção Herpetológica da Universidade Federal do Rio Grande do Norte (CLAR-UFRN, AAGARDA6854, 6883, 6959, 6963, 6965). We constructed spectrograms, sonograms, and oscilograms with SoundRuler using the following parameters: FFT = 256, hanning window type, and Overlap = 0.9. Acoustic parameters were measured in Raven Pro 1.4 and sonograms produced with as follows: FFT window width = 256, Frame = 100, Overlap = 50%. Data are presented as mean ± SD (range). The terminology used to describe calls follows Gerhardt & Hubber (2002) and Wells (2007). Calls were deposited at the Arquivos Sonoros da Universidade Federal do Rio Grande do Norte (ASUFRN 536-540).

The advertisement call of *Haddadus aramunha* consist of a short multipulsioned note with low sound intensity (Table 1; Figure 1A, B and C). Four males were calling perched on branches (52.5 ± 33.5 cm above ground; Figure 1D) and one on a termite nest 25 cm above ground. We only observed males calling during or after heavy rains, as reported for *H. binotatus* (e.g., Carvalho & Martins 2012). Although only perched *H. aramunha* males were recorded, we also observed individuals calling on the ground and leaf litter, as previously reported by Napoli et al. (2010).

The advertisement calls of *H. aramunha* and *H. binotatus* are similar (see, Carvalho & Martins 2012; Dias et al. 2012; Moura et al. 2012). Both are formed by short, multi-pulsioned notes ranging from 4 to 6 pulses. However, they differ in duration (shorter in most populations of *H. binotatus*: \bar{x} = 21 ms, 12–33 in Dias et al. 2012; \bar{x} = 14 ms, 10–16 in Moura et al. 2012; \bar{x} = 26 ms, 16–57 in Carvalho & Martins 2012) and in dominant frequency (higher in *H. binotatus*: \bar{x} = 1173 Hz, 1034–1464 in Dias et al. 2012; \bar{x} = 1683 Hz, 1548–2234 in Moura et al. 2012; \bar{x} = 1520 Hz, 1220–1780 in Carvalho & Martins 2012). In general, male *H. binotatus* are smaller (< 40 mm) than *H. aramunha* (> 40 mm, Table 1), what could account for the differences in dominant frequencies. However, dominant frequencies of male *H. binotatus* with SVL ranging from 32–38.6 mm overlap with those of *H. aramunha* (see Dias et al. 2012). The similarity between the advertisement calls of these two species supports the recent replacement of *Strabomantis aramunha* to the genus *Haddadus* (Amaro et al. 2013), while structural and temporal differences differ among the two species, providing another example of the importance of frog advertisement calls for taxonomy.

- Dias, I.R., Lourenço de Moraes, R. & Solé, M. (2012) Description of the advertisement call and morphometry of *Haddadus binotatus* (Spix, 1824) from a population from southern Bahia, Brazil. *North-Western Journal of Zoology*, 8, 107–111.
- Gerhardt, H.C. & Huber, F. (2002) *Acoustic Communication in Insects and Anurans. Common Problems and Diverse Solutions*. The University of Chicago Press, Chicago, 531 pp.
- Moura, M.R., Lacerda, J.V.A. & Feio, R.N. (2012) The advertisement call of *Haddadus binotatus* (Spix, 1824) (Anura; Craugastoridae). *Zootaxa*, 3224, 67–68.
- Napoli, M.F., Juncá, F.A., Cruz, D. & Abreu, R.O. (2010) Amphibia, Anura, Strabomantidae, *Strabomantis aramunha* Cassimiro, Verdade and Rodrigues, 2008: Distribution extension with notes on natural history, color patterns, and morphometric data. *Check List*, 6, 275–279.
- Wells, K.D. (2007) *The Ecology and Behavior of Amphibians*. The University of Chicago Press, Chicago and London, 1148 pp.