



## Correspondence

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### **Advertisement call and colour in life of *Allobates crombiei* (Morales) “2000” [2002] (Anura: Aromobatidae) from the type Locality (Cachoeira do Espelho), Xingu River, Brazil**

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*Allobates crombiei* was described by Morales, “2000” [2002] based on specimens collected by Ronald I. Crombie from Cachoeira do Espelho, on the right bank of the Xingu River, Pará State, Brazil. The original description was short and did not include the call or colour in life. Rodrigues & Caramaschi (2004) suggested that the taxonomic status of this species need be clarified. We are confident that the species collected and recorded by us is *Allobates crombiei* (Morales) “2000” [2002] because this is the only species of *Allobates* found calling in forest near Cachoeira do Espelho, and the character diagnosis in preserved specimens is similar, except that, based on preserved specimens, Morales (2002) considered the ventrolateral and the oblique lateral stripes to be absent. This may be because they are imperceptible in preserved specimens. However, unlike recent authors, Morales (2002) also considered the oblique lateral stripe to be absent in *Allobates brunneus*, *Allobates gasconi* and *Allobates ornatus*, in which he illustrated diffuse spots.

On 08 and 09 March 2009, A. P. Lima and A. Amézquita visited Cachoeira do Espelho and found calling males, reproductive female and clutches of *Allobates crombiei* on the right bank of Xingu River, 54 km from Altamira (3° 39' 00.4"S, 52° 22' 33.2" W). The animals were found in a forest about 100 m from the right bank of the Xingu River near a temporary stream and ponds. Ten females and eleven males were collected early in the morning and late afternoon, and voucher specimens were deposited at Instituto Nacional de Pesquisas da Amazônia, INPA-H (males 30457, 30461–62, 30464, 30471–77; females 30458–60, 30463, 30465–70), Manaus, Brazil. Animals were initially anaesthetized with benzocaine ointment, and subsequently killed with an overdose of the same anaesthetic in accordance with permit number 13777-2 RAN-ICMBio/IBAMA.

We recorded 2–5 min of consecutive advertisement calls for each of eight males by placing an AKG D-190-E microphone, connected to a Sony WM-D6C tape recorder, 100–150 cm in front of the male. Tape recordings were digitized at 44.1 kHz, 16 bits, and analysed by using oscillograms and power spectra (Blackman window, frequency resolution of 80 Hz, and DFT of 1024) on Raven 1.4 software (Charif *et al.* 2008). For each recorded male, we analyzed four notes from the middle of each of 5–10 calls, avoiding the warm-up notes that usually occur at the beginning of a call. Thus, a total of 258 notes from 57 calls were analyzed and averaged per male to render the statistical unit of analysis. Call traits values were represented by the average of the eight recorded males  $\pm$  one standard deviation and the range of values. Air temperature at the time of recording varied from 24.1 to 26.6 °C.

*Allobates crombiei* produces multi note advertisement calls; males utter series of 25–59 ( $43 \pm 6.38$ ) notes with frequency modulation and repeated at a very high and regular rate. The mean call duration was  $3.52 \pm 0.49$  s (1.91–4.53). During a call bout, two consecutive calls are separated by intervals of  $10.07 \pm 11.81$  s (2.67–50.76) (Fig. 1A). The mean note duration was  $0.028 \pm 0.003$  s (0.021–0.037) and the inter-note interval was  $0.053 \pm 0.005$  s (0.045–0.069). For each note, the mean dominant frequency was of  $4737 \pm 200$  Hz (4522–5383), the lowest (20 dB below the peak intensity) frequency was  $4471 \pm 136$  Hz (4202–4843), and the highest (20 dB below the peak intensity) frequency was  $5067 \pm 178$  Hz (4817–5650) (Fig. 1A). A video of calling males can be seen in Sapoteca webpage (<http://ppbio2.inpa.gov.br/en/sapoteca/home>). Colour in life is similar in males and females (Fig. 1B to 1C) and differs from preserved individuals. The dorsum background is orange to reddish brown and crossed by a darker hourglass or X-shaped middorsal blotch that starts directly behind the eyes. The blotch can be discontinuous near the suprascapular region and usually reaches the urostyle. The dark- brown lateral band extends from the tip of the snout to the groin, where it is wider. It is ventrolaterally