

Notes on an unusual position of calling site of *Dendropsophus minutus* (Peters, 1872) (Anura: Hylidae), northeastern São Paulo, Brazil

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In amphibians, advertisement calls are fundamental to species recognition, mate choice, and to maintain distance between calling individuals (Duellman and Trueb, 1994). Intra-specific difference in spatial position of calling sites is an important factor taken into account during the mate choice and then a relevant feature for the reproductive success of males (Duellman and Trueb, 1994). Here, we report for the first time a male of *Dendropsophus minutus* calling on the top of a tree, about 4 m high (Figure 1). This species is a small tree frog (average SVL = 21 mm; Brasileiro et al., 2005) widely distributed in South America, occurring in Colombia, Venezuela, Guianas, Trinidad, Ecuador, Peru, Brazil, Bolivia, Paraguay, Uruguay, and Argentina (Frost, 2017). Males usually vocalize in marginal vegetation of temporary and permanent bodies of water located in open areas, edge of the forest and inside of the forest (Bertoluci and Rodrigues, 2002).

On 5 January 2016, 19:30, we found a male of *D. minutus* vocalizing perched over a leaf at the top of a tree (Figure 1), in a Cerrado area, in the Estação Ecológica de Itirapina (22.2304°S, 47.8190°W, WGS84; 783 m a.s.l.), northeastern state of São Paulo, southeastern Brazil. The tree was located at the edge of the forest fragment and it was separated from a pasture by a dirty road of 4 m wide (Figure 1). All measurements were

obtained by using a tape measure (0.05 m of precision). The distance between the tree's trunk and the margin of the nearest permanent water body was 10.60 m (Figure 1). The following distances were measured from the leaf where the specimen was vocalizing. The straight distance from the calling site and the margin of the water body was 6.95 m (Figure 1). The male of *D. minutus* was vocalizing at 3.90 m above the ground.

We compiled all reported data about height of the calling sites for *D. minutus* (Table 1) and found that our observation was 2.70 m higher than the highest value known in the literature (Table 1). Studies have found that the presence of congeneric species (e.g., Menin et al., 2005), the number of individuals of the same or different species vocalizing in the same water body (e.g., Bertoculi and Rodrigues, 2002), and the amount of calling sites available (e.g., Caramaschi, 1981) influence the perch height of anuran species. In the same night, we recorded more than 30 individuals of *D. minutus* vocalizing in the water body nearest to the tree. We also recorded *Boana albopunctatus*, *B. faber*, *Physalaemus cuvieri*, and *Leptodactylus labyrinthicus* vocalizing in the water body, all previously recorded in the area (Brasileiro et al., 2005).

After we found the calling male, one female of the same species was sighted at 0.20 m from the male (Figure 1). The female kept her position for 30 minutes, and then left without contacting the male. At the end of the observations, both individuals were captured and their identifications and sexes were confirmed.

We identified the specimens as belonging to *D. minutus* since they presented small-sized, of 21–28 mm snout-vent length (voucher specimens), head short, snout rounded; dorsum orange with a pair of elaborated dorsolateral stripes; belly whitish; throat yellow in the male and white in the female; tympanum indistinct (Figure 1C; Heyer et al., 1990; Provet et al., 2011). Although Gehard et al. (2014) have described that

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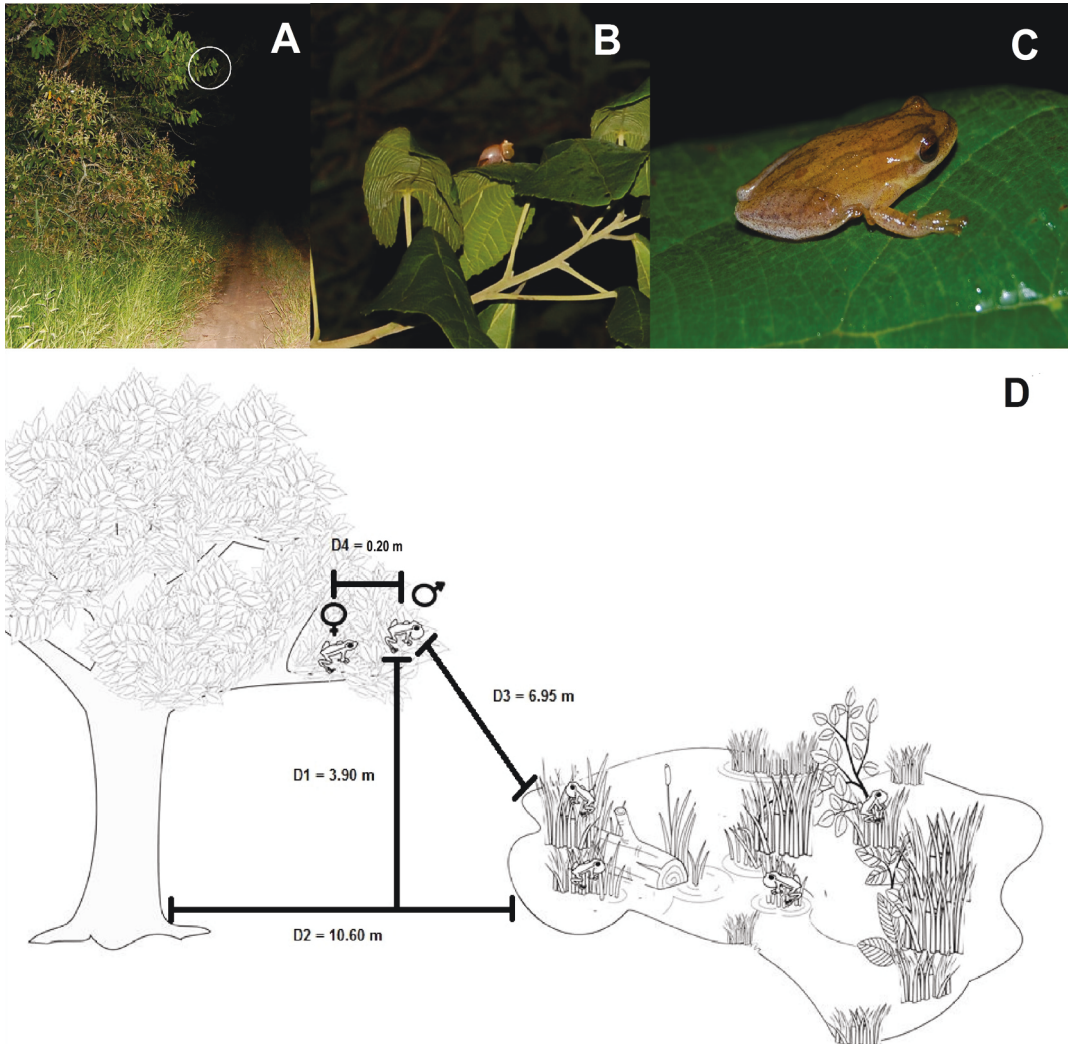


Figure 1. Location of the calling site where *Dendropsophus minutus* was found (white circle), in the Estação Ecológica de Itirapina, southeastern Brazil (A). Male of *D. minutus* vocalizing over a leaf at the top of the tree (B). Detail of male specimen (C). Illustration of the scenario in which the specimen of *D. minutus* was observed (D): distance between the male and the ground (3.90 m; D1); distance between the tree's trunk and the margin of the nearest permanent water body (10.60 m; D2); perpendicular distance between the male and the permanent water body (6.95 m; D3); distance between the male and female of *D. minutus* (0.20 m; D4). Photos by R.A.B.

D. minutus is a complex group with at least 43 lineages throughout its distribution; the individuals of *D. minutus* occurring in the state of São Paulo belong to only one lineage (Gehard et al., 2014). Furthermore, call characteristics of *D. minutus* can be easily recognized in different populations (Cardoso and Haddad, 1984). According to Cardoso and Haddad (1984) and Morais et al. (2012), populations of *D. minutus* have a complex

vocal repertoire composed by three different notes which may be emitted isolated or combined. Here, the vocalization of the observed individual was similar to vocalizations emitted by males of *D. minutus* from other populations of the state of São Paulo (authors' personal observation).

The specimens reported in this study were not collected, instead, two other individuals identified as *D.*

Table 1. Highest values of the perch height for calling sites of *Dendropsophus minutus* obtained from literature and observed in the present study.

Highest values of the perch (in m)	References
0.30	Afonso and Eterovick (2007)
0.30	Grandinetti and Jacobi (2005)
0.50	Morais et al. (2012)
0.70	Bertoluci and Rodrigues (2002)
0.70	Schulze et al. (2009)
0.80	Brasileiro et al. (2005)
1.00	Carvalho and Jesus (2015)
1.00	Eterovick et al. (2010)
1.20	Silva et al. (2008)
3.90	Present Study

minutus were collected in the same locality as voucher specimens (CFBH 38532 and 38533 - Coleção de Anfíbios do Departamento de Zoologia, Universidade Estadual Paulista, municipality of Rio Claro, state of São Paulo, Brazil).

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