

Unusual amplexus in *Dendropsophus columbianus* (Anura: Hylidae)

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Several species of tropical frogs that breed in water habitats form explosive mating aggregations after heavy rains, particularly those from the families Hylidae and Bufonidae (Wells, 2007). During those mating events, unusual amplexus can take place, including multiple amplexus, amplexus between males, amplexus between alive males and dead females (necrogamy), interspecific amplexus, and even amplexus with inanimate objects (Mollov et al., 2010). Abnormal cases of amplexus have been mostly documented for anurans in temperate regions and little information is available for tropical species (Tovar-Rodríguez et al., 2009; Machado and Bernarde, 2011). Herein we document the first record of abnormal amplexus in *Dendropsophus columbianus* (Boettger, 1982).

Boettger's Colombian Treefrog (*D. columbianus*) is a common species with a wide distribution in Central and Western Andes of Colombia, between 950 and 2300 m (Ruiz-Carranza et al., 1996). Usually, this species is found aggregated in permanent and temporary ponds where they breed (Bolívar y Renjifo, 2004), and show peaks of vocal activity during the night and isolated calls in the mornings (D.A. Gómez-Hoyos, pers. obs.). On October 30th 2010, we heard a chorus of males with high vocal activity in the morning, which could be audible from approximately 300 m. These observations were recorded in the municipality of Circasia, Department of Quindío, at the Central Andes of Colombia (04°37'57.4"N; 075°38'24.8"W; 1710 m), in a temporary pond (approx. 200 m²) located in livestock pastures. We walked around the pond for 30 minutes and males did not decrease the advertisement calls.

We observed three cases of multiple amplexus (two, three and five males, respectively) (Fig. 1A), where females remained submerged and immobile. We also recorded 17 dead individuals of *D. columbianus*, including males and females. We could identify five floating females, two of them being amplexed by alive males with no evidence of laid eggs around them; the dead females were decomposed and covered by a fungal layer (Fig. 1B). This type of amplexus can be considered as necrogamy, an event that has been reported for other anuran species: alive *Rana boylei* male amplexed with dead *R. boylei* female (Bettaso et al., 2008), alive *Ascaphus truei* male with dead *R. aurora* juvenile (Waterstrat et al., 2008), and *R. temporaria* male both with a dead *R. temporaria* female and a dead *Pelophylax ridibundus* female (Mollov et al., 2010).

It is known that multiple amplexus can cause death of females by drowning (Wells, 2007). Hence, we attribute the death of both males and females to the formation of the so-called mating balls. In general, the unusual amplexus reported here occurred during explosive mating aggregations, which are typical in some hylid frogs breeding in ponds (Wells, 2007). In such events, multiple amplexus may result from male-biased operational sex ratio that intensifies male-male competition for mates (Wells, 2007; Mollov et al., 2010). Our descriptions correspond to an anecdotal observation, so we suggest that a more detailed and rigorous study on the reproductive biology and population ecology should be carried out in order to understand the factors contributing to these events, as well as the consequences for the population and for the reproductive success of individuals.

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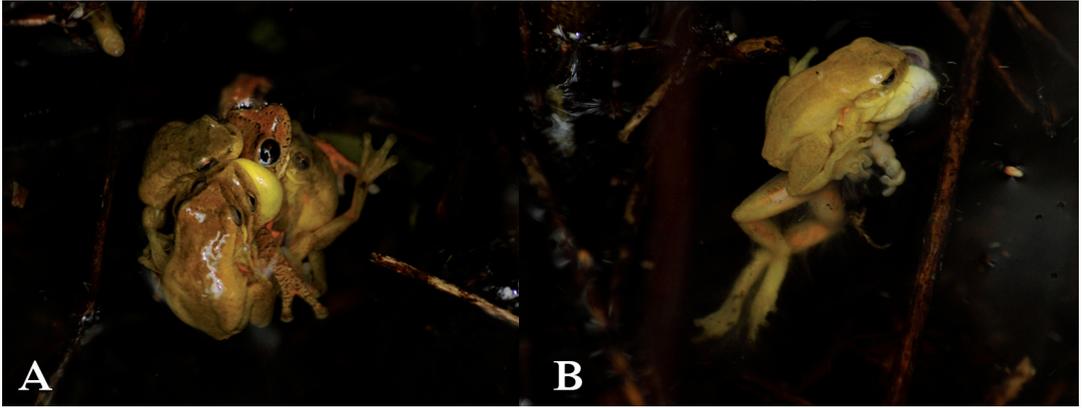


Figure 1. Unusual amplexus in *Dendropsophus columbianus*. A. multiple amplexus involving four males and one female; B. amplexus between an alive male and a dead female (necrogamy).

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