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Short Communication

Notes on reproductive behavior and vocalizations of *Pristimantis taeniatus* (Anura: Strabomantidae)

Nelson Falcón-Espitia,[1,2] Juan Camilo Ríos-Orjuela,[1,2] M. Carolina Martínez-Botero,[3] Alejandra Arias-Escobar,[4] and Dennys Plazas-Cardona[5]

[1] Universidad de los Andes, Departamento de Ciencias Biológicas, Laboratorio de Biología Evolutiva de Vertebrados. Bogotá, Colombia. E-mail: ngfalcone@unal.edu.co.

[2] Universidad Nacional de Colombia, Instituto de Ciencias Naturales, Grupo de Morfología y Ecología Evolutiva. Sede Bogotá, Colombia. E-mail: jcriosor@gmail.com.

[3] Universidad Nacional de Colombia, Facultad de Ciencias, Grupo Estudiantil de Herpetología. Sede Bogotá, Colombia. E-mail: mcmartinezbo@unal.edu.co.

[4] Independent researcher. E-mail: aariase@unal.edu.co.

[5] Universidad Nacional de Colombia, Instituto de Ciencias Naturales, Grupo de Investigación de Ornitología. Sede Bogotá, Colombia. E-mail: deplazasc@unal.edu.co.

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Palavras-chave: Amplexo, Canto nupcial, História natural, Modo reprodutivo.

The genus *Pristimantis* Jiménez de la Espada, 1870 includes a total of 598 species (Frost 2023) distributed throughout Central and South America. In Colombia, 224 species of this genus are currently known (Acosta-Galvis 2023). Most species occur in the Andes, a geographically and ecologically diverse mountain range that has generated richness and endemism in this group in contrast to the Pacific lowlands or the Amazon region (Lynch *et al.* 1997).

Pristimantis taeniatus (Boulenger, 1912) was described based on a single specimen collected in the San Juan River (department of Chocó). This species is characterized by a conspicuous supratympanic fold, as well as small tubercles on the eyelids, ulna, and heel (Lynch and Ardila-Robayo 1999). It occurs from southern Costa Rica through Panamá to Colombia (Lynch 1980, Gómez-Hoyos *et al.* 2018, Batista *et al.* 2020, Arias *et al.* 2023), where is limited to the Andean and sub-Andean forests of the Magdalena valley, in addition to the Pacific lowlands (Lynch and Ardila-Robayo 1999, Acosta-Galvis 2000).

The reproductive ecology of *P. taeniatus* has not been described. Herein, we describe amplexus and the courtship call of this species, based on an encounter of an amplectant pair while sampling on 22 August 2022 at Atala farm (Viotá Municipality, Cundinamarca Department, Colombia; Figure 1) near an open forest at an altitude of 1368 m altitude (Figure 2). The pair

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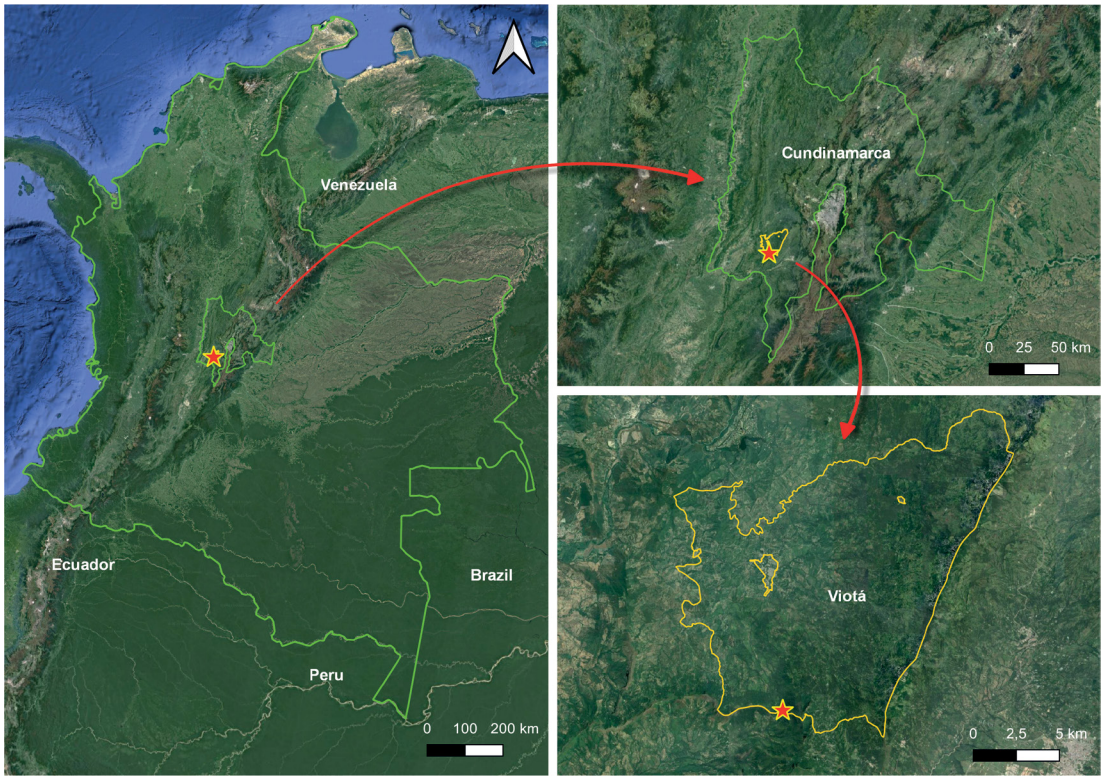

Figure 1. Location of the described reproductive event.

was sighted at 19:30 h on a night with a full moon and no cloud cover. After observing the pair, the individuals were captured and deposited at the Museo de Historia Natural CJ Marinkelle at the Universidad de los Andes (ANDES-A 5445, 5446) for identification. The amplectant individuals were found at a height of 80 cm from the ground, in the middle of a group of at least 20 males calling among leaves at heights between one to four meters. Amplexus was axillary (Figure 2), the most common type of amplexus in Anura and the one that is most common in the family Strabomantidae and the clade Terrarana (Carvajal-Castro *et al.* 2020).

Axillary amplexus seems to positively impact the reproductive effectiveness of species that breed in heterogeneous terrestrial microhabitats such as those inhabited by *P. taeniatus*. In these microhabitats, the persistence of traits that reinforce mate-guarding behavior by males is important for species with explosive breeding (Duellman and Lehr 2009, Carvajal-Castro *et al.* 2020) while at the same time reducing the vulnerability of the amplectant pair to predators during egg deposition (Wells 2007).

The courtship call was described from a total of 11 recordings, made from seven males prior to amplexus, and two recordings of the amplectant male prior to amplexus. Sequences of at least 15 s of spontaneous calls were obtained and analyzed with Raven Pro v1.65 (Yang 2022) in which the parameters of pulse and fundamental and dominant frequency of the call were measured. Recordings were made using a Movo VXR10 cardioid microphone in Android RecForge II app (version 1.2.8.6g) with fixed

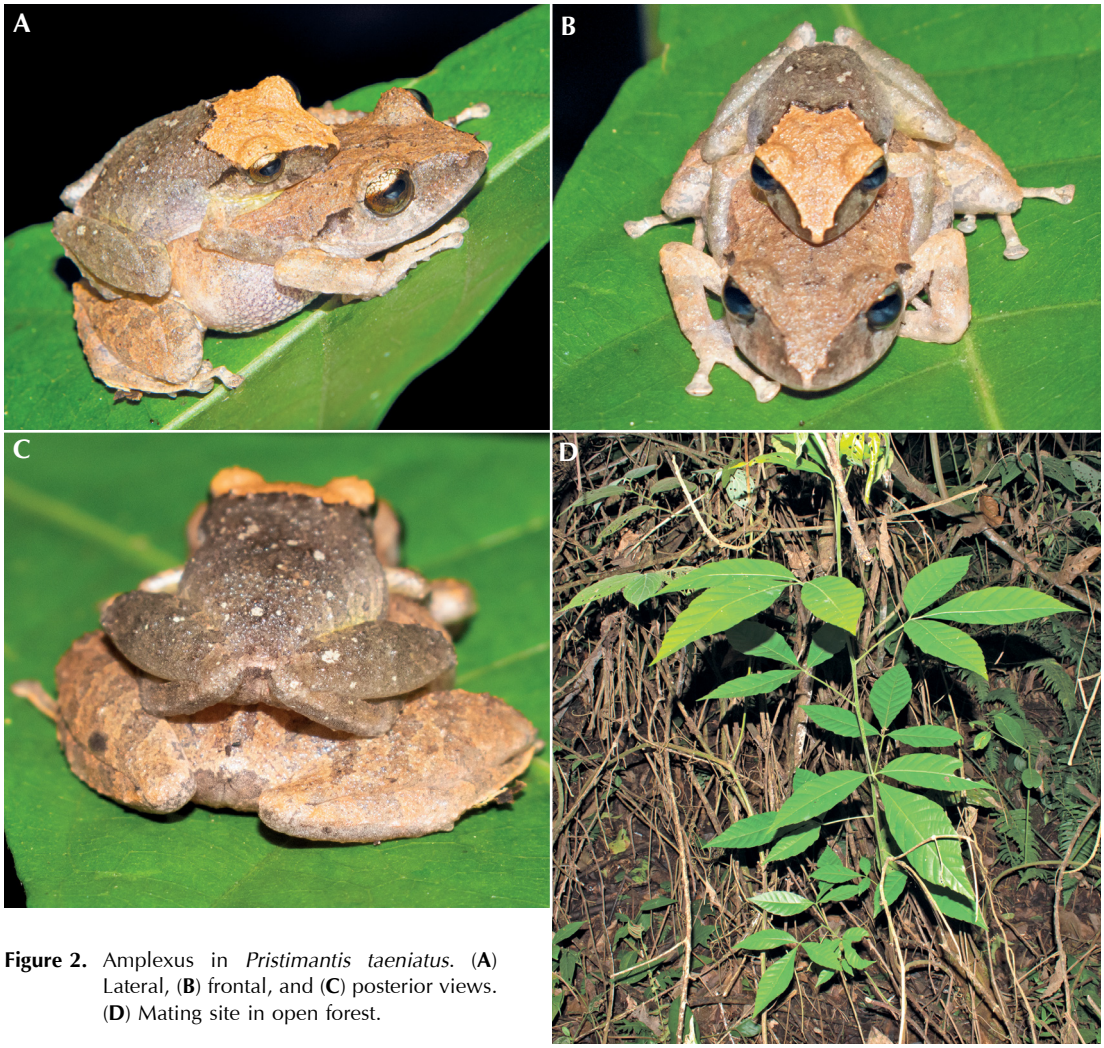

Figure 2. Amplexus in *Pristimantis taeniatus*. (**A**) Lateral, (**B**) frontal, and (**C**) posterior views. (**D**) Mating site in open forest.

parameters at 44kHz stereo. The recorded call is available in Figshare repository under DOI: 10.6084/m9.figshare.22783289.

The call was characterized as a fast note with an average duration of 0.53 s composed of several pulses (7–9) that are emitted at a dominant frequency of 2.6 ± 0.15 kHz and a fundamental frequency of 1.6 ± 0.2 kHz (Figure 3). The average pulse rate was 14 pulses per second. The courtship call in this species is classified as a non-frequency modulated call with uniform notes according to Emmrich *et al.* (2020).

Species that utilize acoustic communication are influenced by the effect of both the microhabitat and the acoustic landscape where they are found (Cano Rojas *et al.* 2021). Our findings show particular characteristics of the courtship call that distinguish it from the advertisement call previously reported for *P. taeniatus* (Bernal *et al.* 2004, Arias *et al.* 2023). This species shows considerable variation in

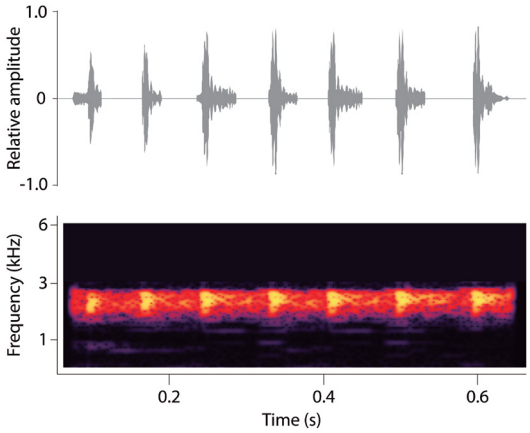

Figure 3. Oscillogram (top) and spectrogram (bottom) of the courtship call of *Pristimantis taeniatus,* recorded in the municipality of Viotá (Cundinamarca).

genetics, morphology, and probably calls throughout its geographic range (Arias *et al.* 2023). Future studies should determine the taxonomic status of *P. taeniatus* sensu lato throughout its distribution so that the identity of the calls described by Bernal *et al.* (2004) in Ibagué municipality near 80 km away from the locality reported here can be confirmed.

The type of amplexus in *P. taeniatus* and its courtship call provides basic information on the natural history of the species. Axillary amplexus in this species reflects the general phylogenetic pattern observed in Terrarana, which is related to ecological and behavioral characteristics that directly influence the reproductive success of individuals. The courtship call described here is the first recorded during a reproductive event in the species; however, it raises questions about the taxonomic identity of populations *P. taeniatus* throughout its range. This question should be addressed in further studies. Obtaining data on characteristics of the reproductive ecology of these amphibians will allow collection of basic natural history information that will strengthen eventual conservation plans for this species.

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