

New records of the lovely leaf frog *Phyllomedusa venusta* from Sierra Nevada de Santa Marta, Colombia with a description of the female release call

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ABSTRACT - *Phyllomedusa venusta* (Anura: Hylidae) is known to have a distribution in lowland areas of the Caribbean region, Magdalena Valley and northern Pacific coast of Colombia. We have discovered new records of *P. venusta* from the Sierra Nevada de Santa Marta that expand its known distribution. Additionally, we describe the release call of a female *P. venusta*, which consists of two series of notes of low intensity. The first has three consecutive notes and the second has five notes. The duration between the notes was measured to be 0.36 seconds \pm 0.31 and there was a time interval of 8.12 seconds between the two series.

INTRODUCTION

The genus *Phyllomedusa* Wagler, 1830, currently has 16 species (Frost, 2023) that are distributed from southern Mexico, extending throughout Central America, through the Andes, the Amazon rainforest of Brazil and as far south as Uruguay (Faivovich et al., 2009). *Phyllomedusa* species are also found on the Caribbean Island of Trinidad and Tobago (Downie et al., 2013). In Colombia, there are currently five recognised species of *Phyllomedusa*: *P. bicolor* (Boddaert, 1772), *P. coelestis* (Cope, 1874), *P. tarsius* (Cope, 1868), *P. vaillantii* (Boulenger, 1882) and *P. venusta* (Duellman & Trueb, 1967). *Phyllomedusa venusta* was described based on morphological differences and has been assigned to the *P. tarsius* group (Barrio-Amorós, 2006; 2009).

Phyllomedusa venusta is distributed in western Venezuela (Infante et al., 2006), Colombia (Ruíz Carranza et al., 1996) and Panama in the Darién (Duellman & Trueb, 1967), at 0 to 1250 m a.s.l. (Acosta-Galvis, 2023). It is an arboreal species associated with tropical dry forest, although it can also be found in humid forest and degraded forest patches (Renjifo et al., 2004). Individuals are usually found roosting at heights between 1–3 m, similar to other species of the Phyllomedusinae (Dias et al., 2017). During the breeding season, individuals tend to group near water bodies, making some nests of eggs above the riparian vegetation; while in the dry season it is most common to find individuals dispersed within the habitat (Mendoza-Roldan, 2017). Male *P. venusta* have an advertisement call with extremely low intensity, composed of a single or a sequence of pulsed notes (Bezerra et al., 2021).

Phyllomedusa venusta has been reported in various departments of Colombia, including Antioquia (Restrepo et

al., 2017), Bolívar (Mendoza-Roldan, 2017), Boyacá (Ovalle-Pacheco et al., 2019), Cesar (Mendoza-Polo & Ochoa-Ramos, 2007; Rueda et al., 2008), Caldas (Acosta-Galvis, 2006), Córdoba (Romero & Lynch, 2012), Chocó (Lynch & Suárez, 2004), Cundinamarca (Duellman, 1974), Magdalena (Ruthven, 1992; Angarita et al., 2015), Santander (Bezerra et al., 2021), Sucre (Acosta, 2012) and Tolima (Acosta, 2000). Mendoza-Polo & Ochoa-Ramos (2007) mention the presence of the species in the foothills of the Sierra Nevada de Santa Marta (SNSM) based on an auditory record, which requires confirmation. Ruthven (1922) also mentions the presence of *P. tarsius* in the municipalities of Fundación and Aracataca in the department of Magdalena, but we cannot corroborate that it is *P. venusta* because there is no museum voucher specimen. The current study provides confirmation of the presence of this species in the SNSM (Fig. 1) and contributes new records to the known distribution of *P. venusta* in Colombia.

OBSERVATIONS AND DISCUSSION

During expeditions between June and August 2022, we observed *P. venusta* in three localities on the north-western flank of the SNSM. The localities include Río Piedra, Fundación, Department of Magdalena, Colombia (10° 31'16.3" N, 74° 04'14.0" W, 176 m a.s.l.) and the Arhuaca indigenous communities of Kankawarwa, vereda La Cristalina, municipality of Fundación, Department of Magdalena (10° 27'0.2" N, 73° 58'35.4" W, 295 m a.s.l.) and Umake, vereda el 50, municipality of Fundación, Department of Magdalena (10° 30'2.67" N, 73° 49'42.99" W, 1050 m a.s.l.) (Fig. 1).

Individual *P. venusta* were found on the vegetation by small ephemeral streams, perching at heights ranging from

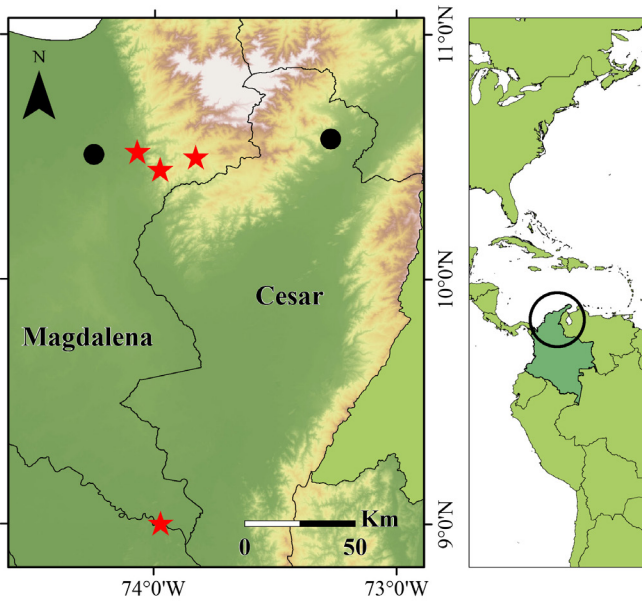


Figure 1. *Phyllomedusa venusta* records for the foothills of the SNSM; red stars = confirmed records with museum voucher to Departamento del Magdalena; black dots = unconfirmed records



Figure 2. Habitat of *Phyllomedusa venusta* in the locality of Río Piedra at 176 m a.s.l. in the Sierra Nevada de Santa Marta, Colombia

50 cm to 150 cm above the ground (Fig. 2). We collected and sacrificed four individuals in a 2 % lidocaine solution, obtained muscle tissue samples which were stored in 96 % ethanol. The specimens were fixed in 10 % formaldehyde solution, stored in 70 % ethanol and deposited in the Biological Collections Centre of the University of Magdalena with accession numbers CBUMAG-ANF: 01278 Male SVL = 6.961 cm; 01282 Male SVL = 6.852 cm; 01312 Male SVL = 5.73 cm; 01402 Female SVL = 8.3 cm.

The voucher CBUMAG: ANF: 01402 corresponds to a female of *P. venusta* which is larger and more robust than the males (Fig. 3A). Furthermore, nuptial pads were present on all collected males (Fig. 3B) while absent from the female (Fig. 3C). Our findings confirm the presence of *P. venusta* in the SNSM (Fig. 4), extending its known distribution range by approximately 169 km from the nearest confirmed locality

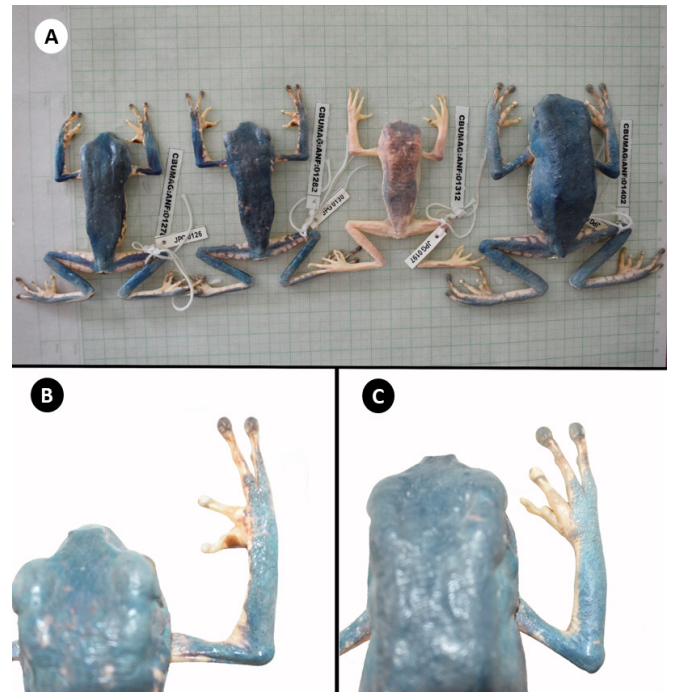


Figure 3. *Phyllomedusa venusta* CBUMAG voucher specimens – **A.** Three males and a larger female, **B.** A nuptial pad present on the first finger of a male, **C.** No nuptial pad present on the first finger of the female

reported for Departamento del Magdalena in the literature, with a collection voucher UIS-MHN-A-0769 (Dueñez-Gómez et al., 2004).

During the fieldwork close to Umake, we recorded a release call of a female *P. venusta* using a Sennheiser ME66/K6 directional microphone connected to a Zoom H4N digital recorder. The female emitted this call when we attempted to manipulate her (Fig. 4A). The recording settings were at a sampling rate of 96 kHz and a resolution of 16-bit. All recordings were analysed using Raven Pro 1.5 software for Windows, following the method described by Köhler et al. (2017), with a FFT window size of 512 points. The female body temperature was recorded using an Extech thermohygrometer RH 101 and IR thermometer.

The release call was emitted at low intensity and consisted of two series of notes. The first series had three notes, and the second had five notes, with a time interval of 8.12 seconds between the two series. On average, each note had a duration of 0.12 seconds \pm 0.05, with a dominant frequency of 1.02 kHz \pm 0.17. The low frequency was 0.73 kHz \pm 0.13 and the high frequency of 1.23 kHz \pm 0.19. The duration between notes was 0.36 s \pm 0.31 (Fig. 4B, Table 1). The recording of the female's release call was deposited in the sound collection of the Instituto de Investigaciones Alexander von Humboldt, Villa de Leyva, Colombia (AvH-CSA-36894). With the description of the female's release call, we are adding to the extensive vocal repertoire of this species (Bezerra et al., 2021), which will contribute to future studies on anuran communication.

Our records contribute to the richness of anuran fauna in the SNSM, which is considered one of the most important biodiversity hotspots in the world, and now having the

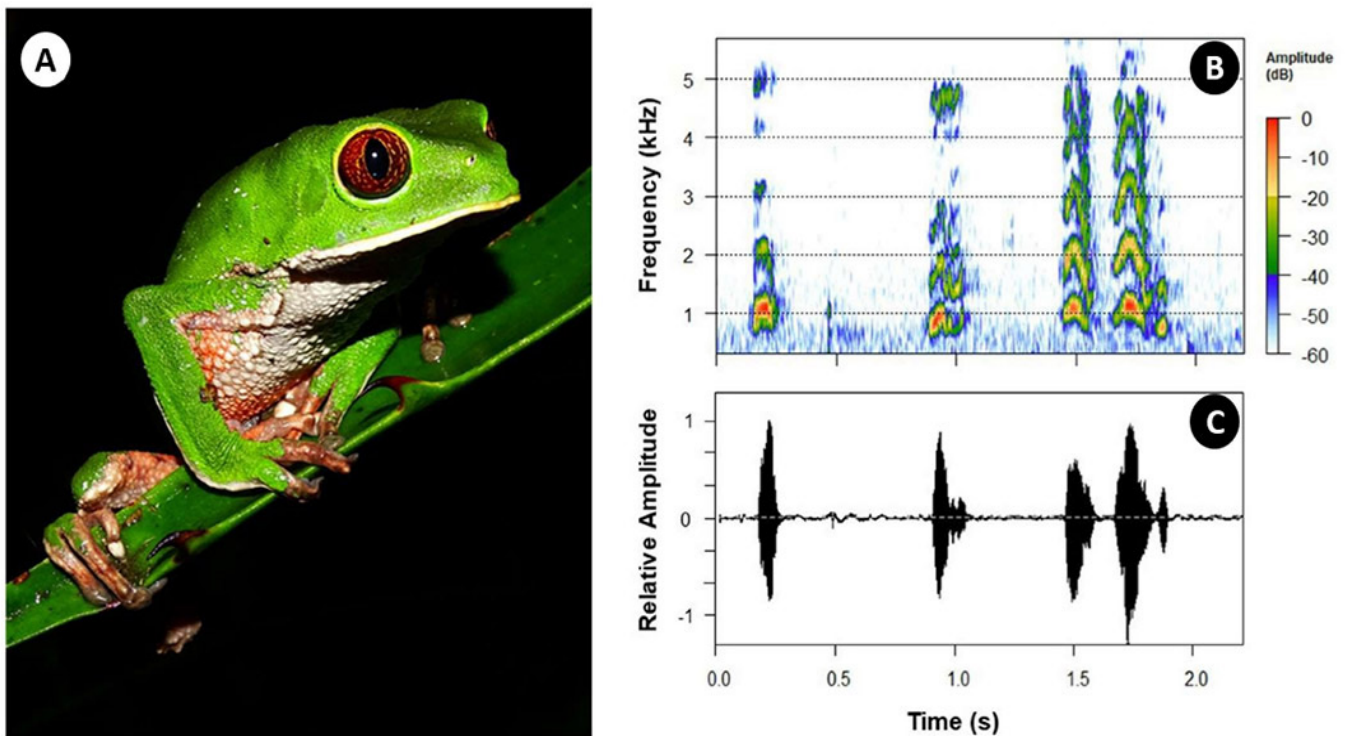


Figure 4. A. Adult female of *Phyllomedusa venusta* (CBUMAG: ANF: 01402, Female SVL = 8.3 cm), from the Umake locality at 1050 m a.s.l. in the Sierra Nevada de Santa Marta, and a recording of its release call – B. Spectrogram and C. Oscillogram

Table 1. Summary of the release call of a female *Phyllomedusa venusta* (shown in Fig. 3) from Umake locality in the Sierra Nevada de Santa Marta, Colombia – body temperature 28 °C

Call Series	Note no.	Note duration(s)	Dominant frequency (kHz)	Low frequency (kHz)	High frequency (kHz)	Inter-note interval (s)
1	1	0.16	1.21	0.89	1.47	0.78
	2	0.08	1.11	0.86	1.30	0.23
	3	0.10	1.14	0.8	1.35	-
2	1	0.10	1.05	0.72	1.21	0.62
	2	0.14	0.82	0.57	1.10	0.41
	3	0.12	1.04	0.68	1.30	0.07
	4	0.17	1.06	0.79	1.26	0.01
	5	0.03	0.70	0.53	0.83	-
Mean		0.12	1.02	0.73	1.23	0.36
SD		0.05	0.17	0.13	0.19	0.31
Min		0.03	0.70	0.53	0.83	0.01
Max		0.17	1.21	0.89	1.47	0.78

northernmost confirmed record of *P. venusta* in Colombia. *Phyllomedusa venusta* is classified as Least Concern (LC) on the IUCN Red List (IUCN, 2023). However, deforestation for crop and livestock expansion is increasing in the SNSM, negatively affecting the herpetofauna of the Colombian Caribbean coast, particularly *P. venusta*, which is a purely arboreal frog (Frost, 2023). We encourage conservation initiatives in the degraded habitat areas where *P. venusta* is found.

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