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DISTRIBUTION EXTENSION OF *LEPTODACTYLUS RHODOMERUS* (LEPTODACTYLIDAE) TOWARDS THE CORDILLERA CENTRAL OF COLOMBIA

EXTENSIÓN DE DISTRIBUCIÓN DE *LEPTODACTYLUS RHODOMERUS* (LEPTODACTYLIDAE) HACIA LA CORDILLERA CENTRAL DE COLOMBIA

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Leptodactylus Fitzinger, 1826 (Leptodactylidae) is a Neotropical genus of frogs composed of 84 currently recognized species (Frost, 2024), which are widely distributed in the Neotropical lowlands from southern North America through Central America to southern South America, being also found in the West Indies (de Sá et al., 2014). The genus is widespread throughout South America, being found on both sides of the Andes in the northern part of South America but, restricted to the eastern Andes throughout almost all of its distribution in South America (de Sá et al., 2014).

The genus includes four species groups (de Sá et al., 2014). The *L.pentadactylus* species group consists of 17 species distributed mainly in South America, characterized by harboring the largest species of the genus (Heyer, 1979; Heyer, 2005; de Sá et al., 2014). In Colombia, eight species belonging to this group are found (Heyer, 1979; Heyer, 2005; de Sá et al., 2014): *L. knudseni* Heyer, 1972; *L. lithonaetes* Heyer, 1995; *L. pentadactylus* (Laurenti, 1768); *L. rhodomerus* Heyer, 2005; *L. rhodomystax* Boulenger, 1884; *L. rugosus* Noble, 1923; *L. savagei* Heyer, 2005 and *L. stenodema* Jiménez de la Espada, 1875. *L. rhodomerus* is distributed throughout the lowland tropical rainforests of the Pacific region of Colombia and in the adjacent tropical forests of northwestern Ecuador, at elevations between 50 and 1,100 meters above sea level (Heyer, 2005). In this article we extend the known distribution of *L. rhodomerus* based on two individuals collected on the eastern slope of the Cordillera Central in the municipality of Amalfi, department of Antioquia, Colombia.

During a characterization of the amphibian and reptile diversity of the Arenas Blancas Nature Reserve (6.950048° N, 74.901983° W, WGS84; 1,114 m a.s.l.) in the municipality of Amalfi, Antioquia, Colombia, between December 2022 and February 2023, two adult specimens of *L. rhodomerus* were found and collected. These specimens were sacrificed by an overdose of 2% lidocaine, fixed in 10% formaldehyde and preserved in 70% ethanol following the standards proposed by Pisani (1973) and McDiarmid (2006). The specimens were deposited in the Colecciones Biológicas de la Universidad CES, colección de Herpetología (CBUCES-D). The Identification of individuals was based on the diagnostic characters proposed by Heyer (2005), being these the bright red coloration on the posterior surfaces of thighs in life; dentigerous process of vomer in strongly arched series; dorsal texture shagreen, with small keratinized-tipped tubercles scattered in the postsacral region; well-developed tympanic fold, extending from eye to above forelimbs insertion; upper lip with three distinct dark triangle-shaped markings; well-defined interocular band, outlined with a darker border; very extensive irregular-shaped glands in groin extending anteriorly towards flanks.

The first record was made on December 19th, 2022 at 19:20 h. This corresponds to an adult female (CBUCES-D 774, SVL = 122.2 mm) that was found on the leaf litter on the ground of a low premontane forest (Fig. 1 A-B). When observed, it fled and hid in its burrow, which was approximately 60 cm deep at ground level. Once the individual was placed in a bag it began to roll around inside the bag, enveloping itself in a layer of foam, which upon contact with the skin caused irritation followed by a stinging sensation, triggering an affectation of the mucous membranes of the respiratory tract for a period of 15 minutes. The second record was made on February 6th,2023 at 20:21 h. This also corresponds to an adult female (CBUCES-D 987, SVL = 102.0 mm) (Fig. 1 C-D), which was found on the ground inside a pasture near a rural road, an area with presence of cattle.

At present, eight species of the *L. pentadactylus* group have been formally reported for Colombia: *L. knudseni*, which is

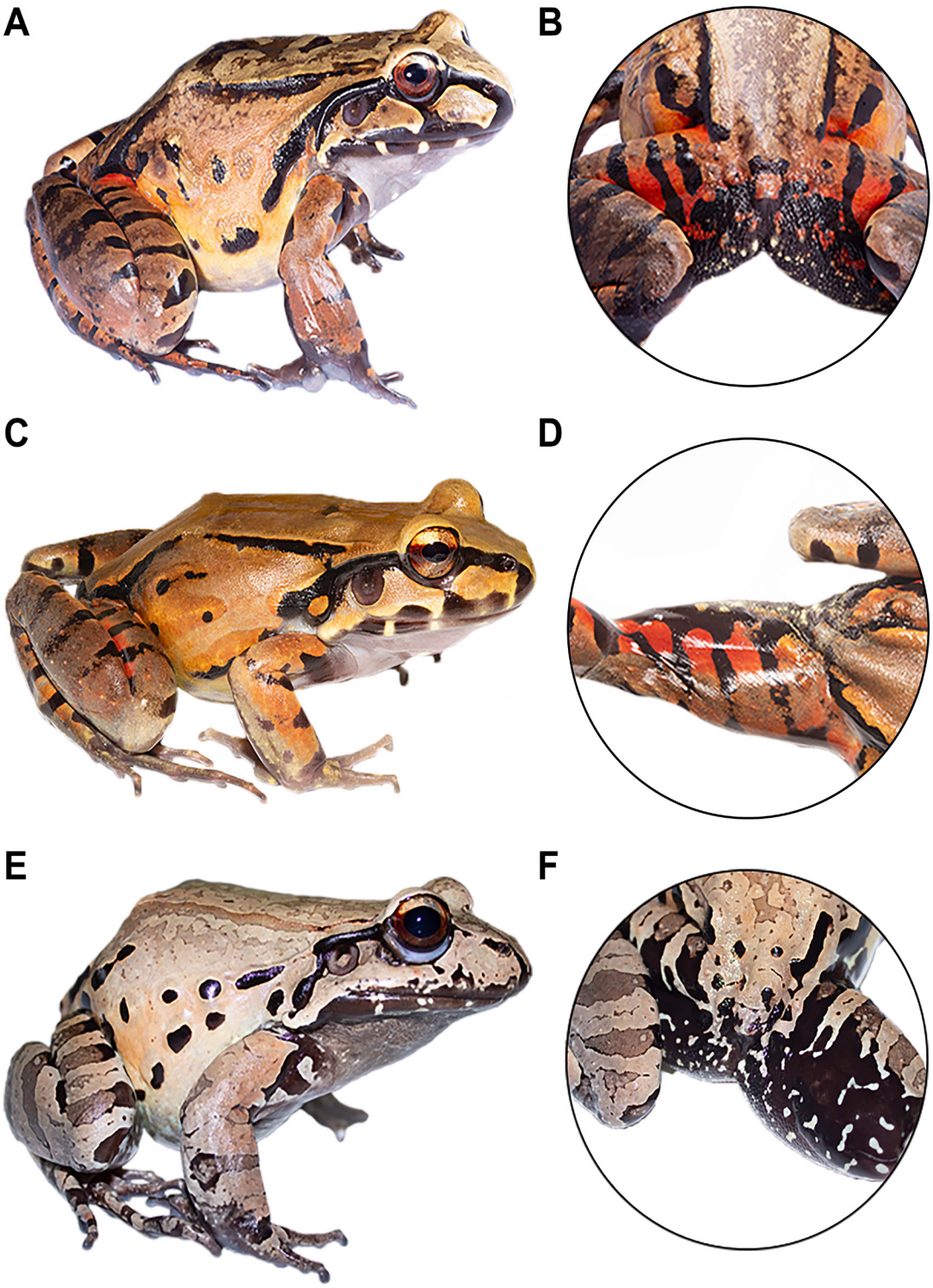

Figura 1. Vista general y coloración posterior de los muslos de los individuos registrados de *Leptodactylus rhodomerus* (A-D) y *Leptodactylus savagei* (E-F) en Amalfi, Colombia. A-B, CBUCES-D 774; C-D, CBUCES-D 987; E-F espécimen no colectado (macho adulto). (Fotos A-B, Esteban Alzate; C-D, Esteban Garzón; E-F, Juan P. Durango).

Figure 1. General view and posterior coloration of the thighs of the individuals registered of *Leptodactylus rhodomerus* (A-D) and *Leptodactylus savagei* (E-F) in Amalfi, Colombia. A-B, CBUCES-D 774; C-D, CBUCES-D 987; E-F unvouchered specimen (adult male). (Photographs A-B, Esteban Alzate; C-D, Esteban Garzón; E-F, Juan P. Durango).

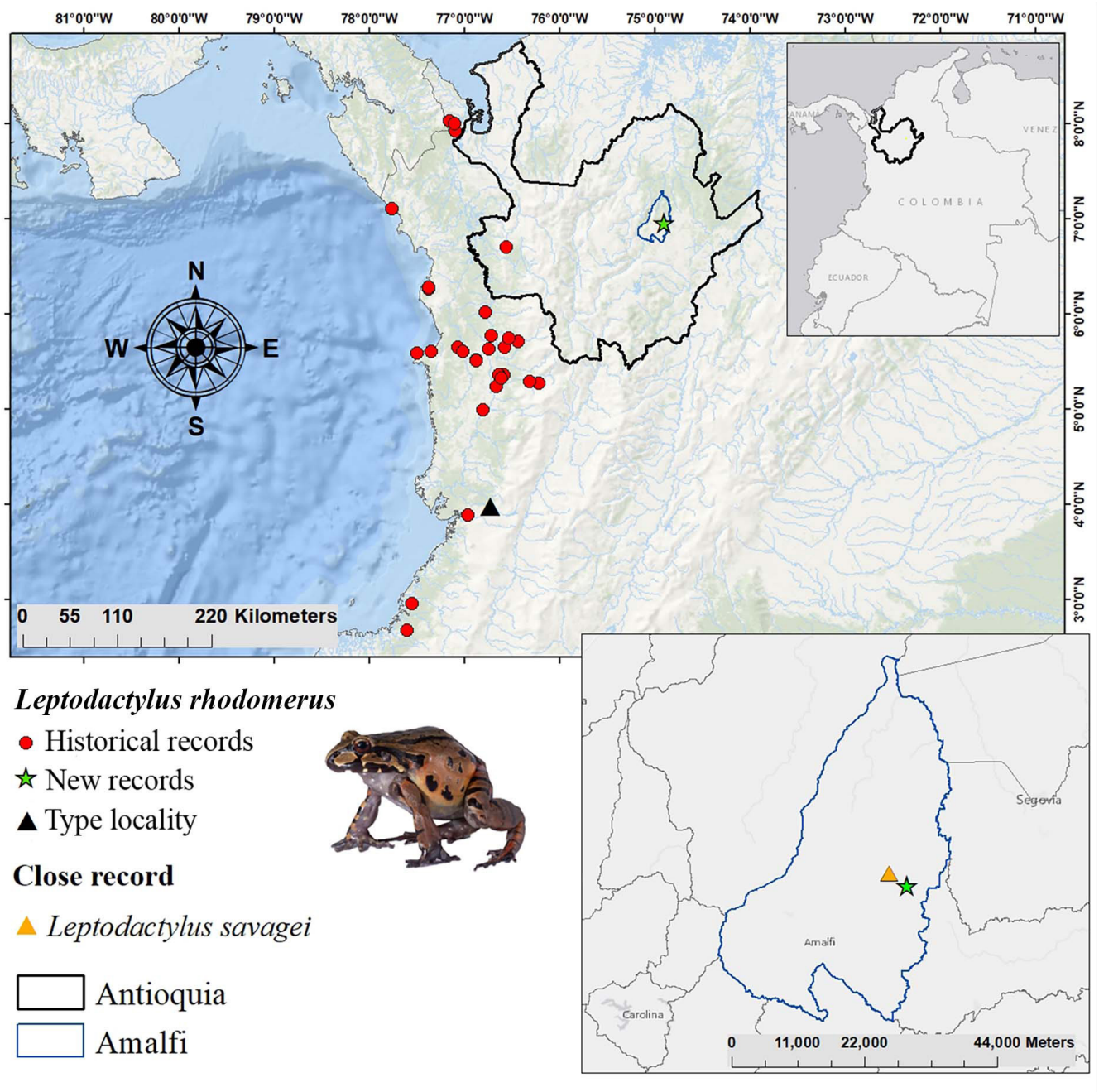

Figura 2. Mapa de la distribución actual de *Leptodactylus rhodomerus* para Colombia. Mostrando los registros previos que había para el país (puntos rojos), la localidad tipo (triángulo negro), los nuevos registros (estrella verde) y el registro más cercano de *Leptodactylus savagei* (triángulo amarillo) para la Cordillera Central de Colombia.

Figure 2. Actual distribution map of *Leptodactylus rhodomerus* for Colombia. Showing the previous records that existed for the country (red spots), the type locality (black triangle), the new records (green star) and the closest record of *Leptodactylus savagei* (yellow triangle) for the Cordillera Central of Colombia.

distributed throughout the Amazon basin in Brazil, Bolivia, Peru, French Guiana, Guyana, Venezuela and Colombia, being found in the latter throughout the lowlands of the Orinoco and Amazon (Heyer, 2005; Lynch, 2005; Lynch, 2006; de Sá et al., 2014); *L. lithonaetes*, which inhabits rocky outcrops in the Colombian departments of Amazonas, Guainía, Vaupés, Vichada and in the Venezuelan states of Amazonas, Apure and Bolívar (de Sá et al., 2014); *L. pentadactylus*, which is distributed throughout the lowland tropical rainforests of the Amazon region and limits of the Orinoquía-Amazonía, being found in countries as Bolivia,

Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname and Venezuela (Heyer, 2005; Lynch, 2007; de Sá et al., 2014). *Leptodactylus rhodomystax*, which is distributed throughout the Amazon basin and the Guiana shield (de Sá et al., 2014); *L. rugosus*, inhabits the Amazon lowlands and southeastern region of the Orinoco basin, in Brazil, Guyana, Venezuela and Colombia, being found in the latter in the department of Guainía (de Sá et al., 2014; Caicedo-Portilla et al., 2022); *L. savage*i, which is distributed in Central America from Honduras to Panama and the northern coast of Colombia, inhabiting the lowland tropical rainforests of the Magdalena Valley and the Caribbean region (Heyer, 2005; de Sá et al., 2014), and *L. stenodema*, which inhabits throughout the lowland Amazon rainforest of Brazil, Colombia, Ecuador, Peru, French Guiana and Suriname (de Sá et al., 2014).

In particular, *L. rhodomerus* is widely distributed in northwestern Ecuador and across the Colombian Pacific lowlands, being reported in the latter in the departments of Antioquia (Heyer, 2005; Robledo & Urrutia, 2018), Chocó (Heyer, 2005; Burbano-Yandi et al., 2015), Nariño (Heyer, 2005; Pinto-Erazo et al., 2020) and Valle del Cauca (Vargas & Castro, 1999; Heyer, 2005), between 50-1,100 m a.s.l. (Fig. 2). Accordingly, to date, this species has only been reported for the western flank of the western cordillera, so the finding of these two individuals constitutes the first records of the species for the central cordillera, particularly in the eastern slopes towards the Magdalena River Valley, extending its distribution approximately 180 km in a straight line, from the nearest report in the western part of the municipality of Frontino, department of Antioquia (6.699083° N, 76.5605° W; 1,009 m a.s.l.) (Robledo & Urrutia, 2018), to the Cordillera Central, northeastern Antioquia.

Heyer (2005) states that for the north of its range *L. rhodomerus* has a parapatric distribution with respect to *L. savagei*, species with which it can be confused at first sight, but from which it differs by characters such as: Sexually active males of *L. rhodomerus* exhibit a small white or black thumb spines and lack chest spines, while *L. savagei* have a large black spine on each thumb and a pair of black chest spines. Also *L. rhodomerus* exhibits a bright reddish coloration on the posterior surfaces of the thighs in life (black coloration in life in *L. savagei*) (Fig. 1 A-F). On the other hand, and understanding that parapatry refers to a pattern in which the ranges of two species meet and form distribution margins with narrow contact zones in which the species can locally coexist (Bull, 1991), previously there weren't known areas where both *L. rhodomerus* and *L. savagei* could cohabit, even occupying the same niche and using similar resources (e.g. use of subterranean cavities as burrows). However, and as part of additional herpetofaunal inventories in the same area where the previously mentioned records were made, the presence of individuals of *L. rhodomerus* and *L. savagei* inhabiting the same locality has been recognized (Durango-Cardona, pers. comm.) (Fig. 2), which raises questions about the possible segregation of niches that these species may exhibit in the area.

Furthermore, the record of *L. rhodomerus* in this area of the central cordillera, which is influenced by the Tumbes-Chocó Magdalena hotspot, supports the connectivity that exists between the Pacific region and the humid forests of the Magdalena Valley, which has also been previously supported by other authors (Lynch & Suárez, 2004; Acosta-Galvis et al., 2020; García-Cobos et al., 2020). Likewise, we believe that by increasing sampling efforts in this and other areas into the Magdalena Valley, additional species that historically have been recognized as unique to the Colombian Pacific will continue to be found, providing further support for the strong connectivity that exists throughout this region.

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