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NOTES ON GEOGRAPHIC DISTRIBUTION

New records and range extension of *Rhinella kumanday* Caicedo-Martínez, Henao-Osorio, Arias-Monsalve, Rojas-Morales, Ossa-López, Rivera-Páez & Ramírez-Chaves, 2024 (Amphibia, Bufonidae) from Cordillera Central of Colombia

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Abstract. We report new locality records for *Rhinella kumanday* Caicedo-Martínez et al., 2024, a recently described toad species known only from the department of Caldas in the Cordillera Central of Colombia. Based on fieldwork and a review of museum specimens, we document this species' presence at two localities in the department of Quindío, extending the species' known distribution approximately 75–80 km south of its type locality. Specimens were found in Andean secondary forests at elevations of 2440–2460 m.

Key words. Anurans, taxonomy, distribution, amphibians

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INTRODUCTION

The genus *Rhinella* Fitzinger, 1826 (Bufonidae) comprises 98 species of toads distributed across nearly all biogeographic regions of the Neotropics (Pereyra et al. 2021; Frost 2025). In Colombia, this genus is represented by 23 species, which are categorized into five distinct phylogenetic groups, found throughout the country primarily in lowland tropical rainforests and dry forests (Acosta 2024). However, species belonging to the *Rhinella festae* group are restricted to montane regions at elevations between 1400 and 3100 m (Pereyra et al. 2021; Caicedo-Martínez et al. 2024). Among them, *Rhinella kumanday* Caicedo-Martínez, Henao-Osorio, Arias-Monsalve, Rojas-Morales, Ossa-López, Rivera-Páez & Ramírez-Chaves, 2024 can be found. This terrestrial and crepuscular toad is endemic to the high-Andean forests of Colombia's Cordillera Central. It inhabits the municipalities of Manizales and Villamaria in department of Caldas, at elevations between 2404 and 3690 m (Escobar-Lasso and Gonzalez-Durán 2012; Rojas-Morales and Marín-Martínez 2019; Caicedo-Martínez et al. 2024). Here, we expand the known distribution of *R. kumanday* by reporting two new localities based on field observations and a review of museum specimens.

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METHODS

On 27 May 2024 one of us (VMZ) conducted fieldwork in the municipality of Córdoba, department of Quindío (04°21′39″N, 075°40′55″W; 2460 m alt.), Colombia. The study area is located on the western slope of the Cordillera Central of the Colombian Andes. This region is characterized by montane cloud-forest vegetation with high humidity and frequent fog (Rangel-Ch. 2015). The area presents an average annual temperature of 12–18 °C and seasonal rainfall patterns resulting in annual precipitation of approximately 2000–2500 mm (Poveda et al. 2011; Guzmán et al. 2014). The landscape consists of a mosaic of primary forest fragments, second-growth forests, and agricultural areas (i.e. coffee plantations), typical of the Colombian coffee-growing region (Perfecto et al. 1996). The forest understory is dominated by ferns, bromeliads, orchids, and other epiphytes, creating microhabitats with high moisture retention. The survey was carried out over one day via direct observation during a diurnal excursion through the area. The specimen was captured by hand, euthanized with lidocaine, fixed in 10% formalin for 24 h, stored in 70% ethanol, and deposited in the Colección de Anfibios y Reptiles of the Universidad del Quindío (ARUQ), in Armenia, Quindío, Colombia. The sex was determined by inspecting mature testes in males and convoluted oviducts and/or eggs in adult females. Snout–vent length (SVL) was measured using digital calipers with an accuracy of 0.01 mm. The description of the webbing formulae is according to Savage and Heyer (1967) and the modifications by Myers and Duellman (1982) and Savage and Heyer (1997). The specimen was collected under permit ACTO_LEGAL: CRQ:224799, Artículo 248 del Decreto-Ley 2811 de 1974.

Additionally, we reviewed specimens of the genus *Rhinella* deposited at the Colección de Anfibios of the Instituto de Ciencias Naturales (ICN-A) of the Universidad Nacional de Colombia, Bogotá D.C., Colombia, specifically examining material from the department of Quindío to determine the presence of individuals of *R. kumanday* in these collections. This examination aimed to verify whether specimens of this recently described species had been previously collected but misidentified or remained undetected within existing museum material.

RESULTS

***Rhinella kumanday* Caicedo-Martínez, Henao-Osorio, Arias-Monsalve, Rojas-Morales, Ossa-López, Rivera-Páez & Ramírez-Chaves, 2024**
Figures 1, 2

New records. COLOMBIA — Quindío • Córdoba municipality; 04°21′39″N, 075°40′55″W; 2460 m alt.; 27.V.2024; V. M. Ospina leg.; in an Andean secondary forest; 1 ♂, ARUQ 1774 • Salento municipality; 04°38′35″N, 075°28′55″W; 2440 m alt.; 2.VI.1991; M. C. Ardila-Robayo leg.; in an Andean secondary forest; 1 ♀, ICN-A 29923.

The adult male specimen collected in Córdoba (ARUQ 1774) had a SVL of 29.9 mm and was found perched on a leaf approximately 50 cm above the ground within Andean secondary forest habitat at 09:21 h. The subadult female specimen from Salento (ICN-A 29923) measured 26.7 mm in SVL and was collected from Andean secondary forest; neither time of collection nor specific microhabitat were available for this specimen.

Identification. Individuals were identified by matching the following characteristics with the description by Caicedo-Martínez et al. (2024): snout long, protuberant, and directed anteroventrally; canthal crest present but weak; preorbital crest and supraorbital present; postorbital and pretympanic crest weak; supratympanic crest distinct; parietal crest present; dorsal surface with scattered tubercles, small and round with some conical; parotoid glands well developed and ovoid; scattered conical tubercle from the posterior side of the parotoid gland until 2/3 of the lateral space to the groin (Figure 1B); skin on dorsal surface of limbs with many warts and conical tubercles; finger I smaller than II; fingers and toes moderate webbed, digits long; many supernumerary tubercles, small, round and low; modal webbing in hand: I 1–2 II 1–2 III–2–2 IV; in foot: I 0–0 II 0–2 III 1–3 IV 3–1 V (Figure 1B); tarsal fold well defined; In life dorsum light brown with cream middorsal line; flanks dark yellow with many grey and dark mottling; venter creamy yellow with dark-brown marks; iris golden with irregular, dark-brown marks (Figure 1A). In preservative dorsum is light brown. The flanks are

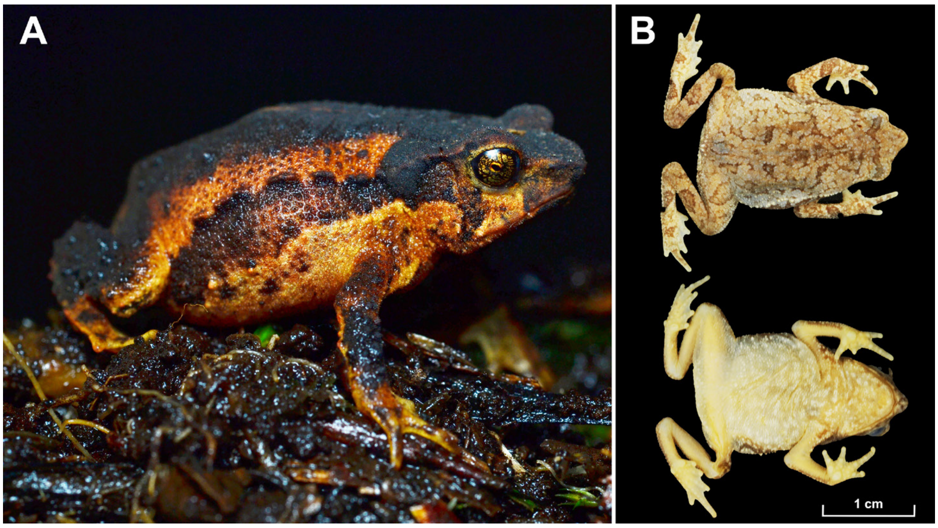

Figure 1. Specimens of *Rhinella kumanday* recorded in the department of Quindío. **A.** ♂ snout–vent length of 29.9 mm, in life, municipality of Córdoba (ARUQ 1774). **B.** ♀ snout–vent length of 26.7 mm, in preservative, municipality of Salento (ICN-A 29923).

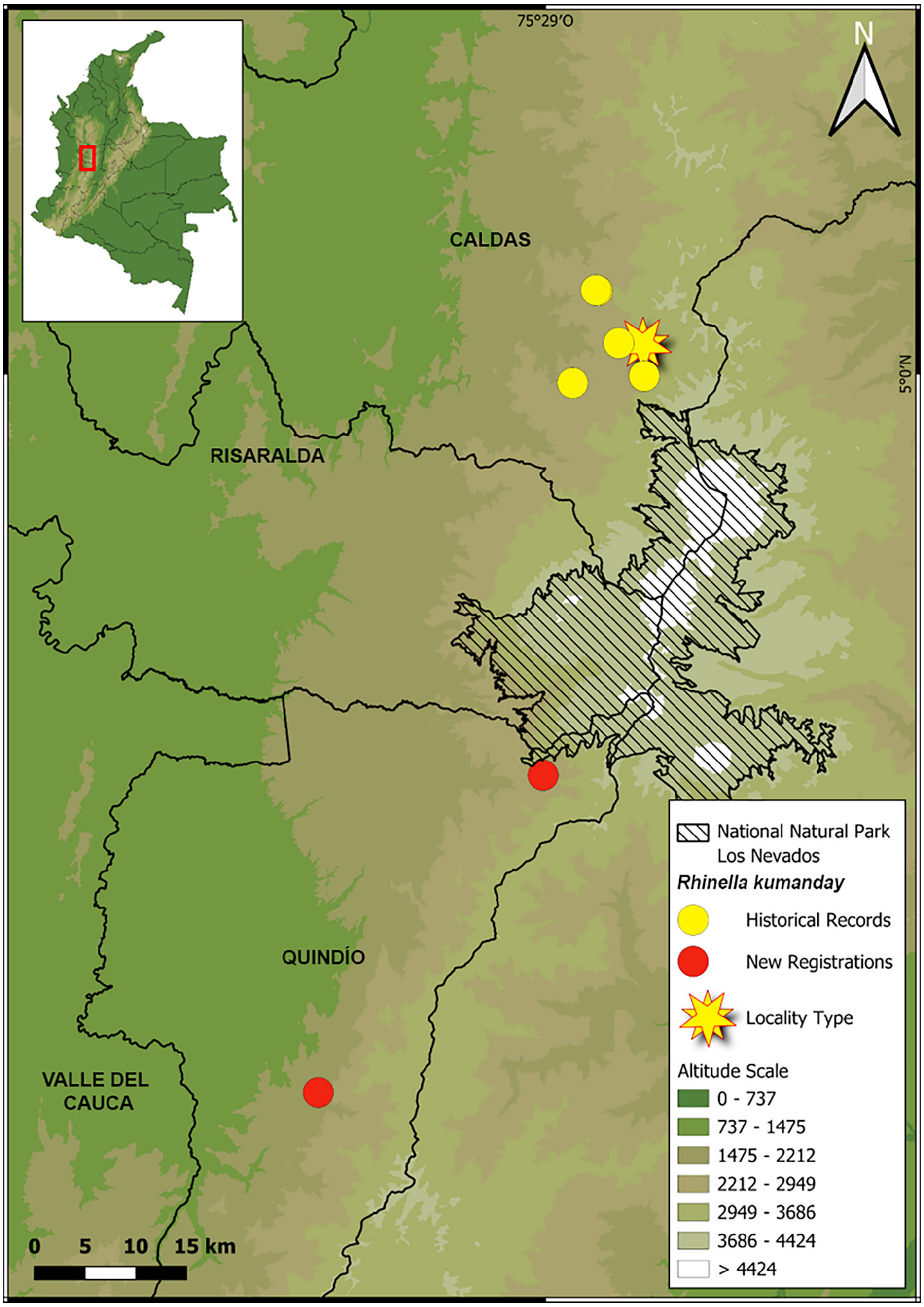

Figure 2. Geographic distribution map showing records of *Rhinella kumanday* in Cordillera Central of Colombia.

dark brown and almost black, with a creamy yellowish line that starts at the upper eyelid and extends to the groin which has a yellow background with black spotting. The ventral surfaces of the body and extremities have brown mottled marks on a yellow mustard background; the brown marks are concentrated in the gular region turning into diffuse marks toward the cloaca (Figure 1B).

DISCUSSION

The new records of *Rhinella kumanday* in the department of Quindío expand the known distribution of the species approximately 75 km toward south from the nearest record and 81 km from its the type locality in Caldas (Figure 2). The new records are particularly important as they confirm the presence of the species in the department of Quindío (1991–2024). Additionally, our records suggest that *R. kumanday* follows the distribution pattern previously documented for other amphibians (e.g., *Colostethus ucumari* Grant, 2007; *Pristimantis alalocophus* (Roa-Trujillo & Ruiz, 1991)) in the Cordillera Central of Colombia, exhibiting a continuous distribution along elevation gradients in Andean forests (Lynch and Duellman 1997; Acosta-Galvis 2000).

The new localities of *R. kumanday* fall within the previously reported elevational range for the species (2404–3690 m alt.; Caicedo-Martinez et al. 2024). The Andean Forest continuity along the Cordillera Central has likely facilitated the species' presence in these new localities (Bernal and Lynch 2008), although climatic regimens associated to high elevations might act as a partial barrier for gene flow between populations located to the south and north of Los Nevados National Natural Park, as documented for other amphibians (e.g., *Pristimantis buckleyi* (Boulenger, 1882), *P. peraticus* (Lynch, 1980)) in the region (Cadavid et al. 2005).

Notably, the new records come from secondary forests embedded in pasture matrices, suggesting some tolerance by *R. kumanday* to modified habitats. However, this condition could also represent a threat to the long-term persistence of these populations, as observed in other Andean amphibians (Cortés-Gómez et al. 2013; Urbina-Cardona 2008). The absence of other *Rhinella* species in these localities might indicate differentiation in microhabitat use or resources that allows *R. kumanday* to occupy this specific niche (Gómez-Hoyos et al. 2017), which is a pattern consistent with other members of the genus (*Rhinella tenrec* and *R. truebae* (Lynch & Renjifo, 1990); *R. paraguas* Grant & Bolívar-García, 2014).

Rhinella kumanday is currently not evaluated by the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. In the original description, Caicedo-Martínez et al. (2024) suggested a preliminary classification as Endangered under criterion B1, based on an estimated extent of occurrence (EOO) of 208 km^2. However, our updated analysis, incorporating new records from Quindío, expands the EOO to 1795 km^2, calculated by the minimum convex polygon method in GeoCAT (Bachman et al. 2011). This increase in EOO suggests a lower risk category, potentially Vulnerable according to IUCN criteria (IUCN 2012), although *R. kumanday* remains a rarely encountered species with irregular temporal occurrences and a low rate of detection in recent surveys (Caicedo-Martínez et al. 2024). While some populations within the Parque Nacional Natural Los Nevados and the Reserva Forestal Protectora Bosques de la CHEC might be protected (Caicedo-Martínez et al. 2024), the newly recorded populations in Quindío are outside of any protected area. Instead, the two known records from this department come from isolated patches of secondary forest surrounded by pastures, highlighting potential threats from habitat fragmentation and changes in land use (Armenteras et al. 2021). Additionally, ongoing activities such as mining (e.g., the Tolda Fría project), habitat degradation, and the lack of information on population trends, natural history, and reproductive behavior raise concerns about this species' long-term viability (Caicedo-Martínez et al. 2024). Further studies are needed to assess population stability and confirm whether *Rhinella* sp. records from Risaralda belong to *R. kumanday* (Mantilla-Castaño et al. 2015).

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

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