

NEW DISTRIBUTIONAL RECORDS OF THE ENDEMIC RAINFROG *PRISTIMANTIS BLASI* DUARTE-MARÍN, MONTOYA-MARÍN & RIVERA-GÓMEZ (ANURA, STRABOMANTIDAE), NEAR CHOCÓ, COLOMBIA

NUEVOS REGISTROS DE DISTRIBUCIÓN DE LA RANA DE LLUVIA ENDEMICA *PRISTIMANTIS BLASI* DUARTE-MARÍN, MONTOYA-MARÍN & RIVERA-GÓMEZ (ANURA, STRABOMANTIDAE), HACIA EL CHOCÓ DE COLOMBIA

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Pristimantis Jiménez de la Espada, 1870 (family Strabomantidae) is a Neotropical genus of direct-developing frogs that harbors about 608 species (Frost, 2024), distributed from Honduras in Central America through South America to northern Argentina (Chaparro et al., 2015; Frost, 2024). Colombia has a significant richness of species of this genus, with approximately 37 % of the total number, being the second country with the highest species richness (Frost, 2024). Especially, the Cordillera Occidental in Colombia exhibits the highest concentration of richness of this genus with approximately 80 spp (Acosta-Galvis et al., 2020; Reyes-Puig et al., 2020). With several of these (~13) known only from their typical locality, and even being considered as “lost” species (Lindken et al., 2024).

Pristimantis blasi Duarte-Marín, Montoya-Marín & Rivera-Gómez, 2022, was recently described based on nine specimens collected in 2019 from the Alto Amurrapá, Santa Cecilia, municipality of Pueblo Rico, department of Risaralda, Cordillera Occidental, Colombia (5.31444° N, 76.15361° W; 1,119 m a.s.l., WGS84). Aside from the type locality, this species was originally reported for a locality in the National Natural Park Tatamá, belonging to the Risaralda department (Duarte-Marín et al., 2022). Since the description, no other localities have been reported for the species, being so far restricted to that area in the western slopes of the Western Cordillera in the Risaralda department. Based on two specimens, we present additional records of *P. blasi*, representing the first record of this species in the department of Chocó, the second known locality and

the northernmost for this species, which will allow a better assessment of the conservation of this species in a future.

On January 6th, 2024, during a survey for amphibians and reptiles at the vereda Guaduas, in the municipality of Carmen de Atrato, Chocó, Colombia, two specimens of *P. blasi* were found on a trail that connects the “Alto del Bacaó” and “La Puria” localities from the Vereda Guaduas (5.721500° N, 76.193694° W; 1,290 m a.s.l., WGS84). 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). Subsequently, the specimens were deposited in the Herpetological Collection of the Universidad CES Biological Collections (CBUCES-D), Medellín, Antioquia, Colombia.

The first specimen, an adult male (CBUCES-D 1886, SVL = 25.07 mm; Fig. 1–A, C, E), was found active at 20:15 h at the edge of the trail on shrub about 30 cm high. The second specimen, a subadult female (CBUCES-D 1887, SVL = 22.16 mm; Fig. 1–B, D, F), was found active further along the trail at 21:30 h on a leaf of a shrub of about 50 cm above ground. The forest surrounding this trail was characterized by tall trees of large diameter, epiphytes and a large amount of low bushy vegetation.

The individuals were identified following the diagnostic characters provided by Duarte-Marín et al. (2022), the most relevant ones being the following: skin on dorsum shagreen,

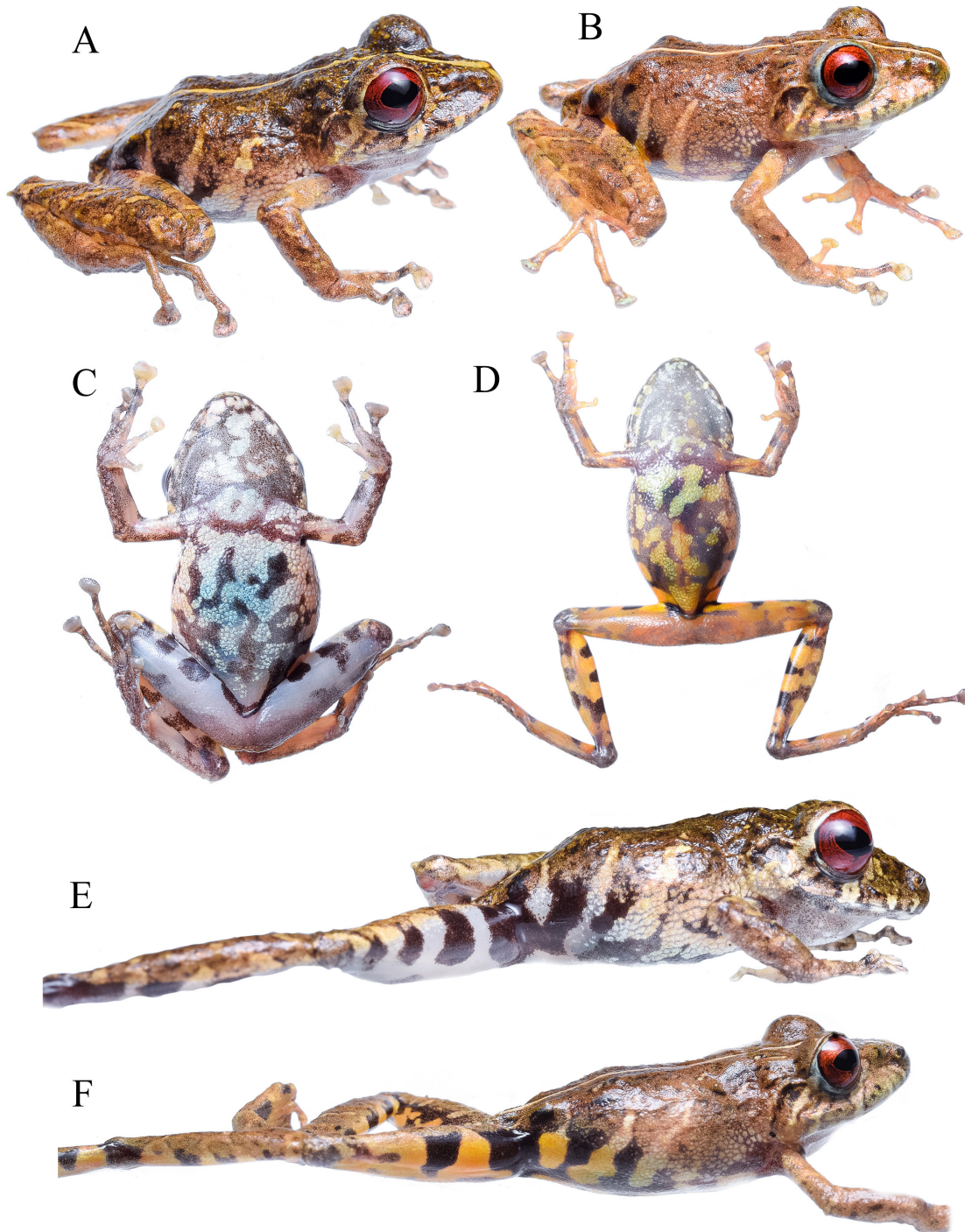


Figura 1. Vista general (A-B), coloración de las superficies ventrales (C-D) y de las áreas ocultas de la ingle y muslos (E-F) de los individuos registrados de *Pristimantis blasi*. CBUCES-D 1887 (A, C, E) y CBUCES-D 1886 (B, D, F). Las fotografías no están a escala. Fotos: Yojan C. Vargas-Ramírez.

Figure 1. General view (A-B), coloration of ventral surfaces (C-D), and hidden areas of groin and thighs (E-F) of recorded individuals of *Pristimantis blasi*. CBUCES-D 1887 (A, C, E) and CBUCES-D 1886 (B, D, F). Photographs not to scale. Photos: Yojan C. Vargas-Ramírez.

with scattered tubercles; dorsolateral folds absent and lateral folds present; skin on venter areolate; snout subacuminate in dorsal view and rounded in lateral view, without rostral papilla; paired glandular white nuptial pads; subconical tubercle on heel present, and small on the outer edge of tarsus; small inner tarsal fold present. In addition, this species is recognized by its striking coloration on the groin, and on the anterior and posterior surfaces of the thighs, which exhibit black coloration with yellow or white spots (Fig. 1 E–F); throat and belly with a white, cream or yellow background with irregular black markings; hidden surfaces of the tibia with a white, cream or yellow coloration with black markings (Fig. 1 C–F).

Since its description, *P. blasi* has not been documented for localities other than its type locality. Thus, this record is the first report for this species outside of its description (department of Risaralda), extending its known distribution by approximately 60 km in a straight line to the north, from Santa Cecilia to El Carmen de Atrato, a municipality in the department of Chocó.

Pristimantis is especially rich in the western profile of the Cordillera Occidental with more than 36 species along altitudes between 1,000 and 3,000 m a.s.l. (Ruíz-Carranza et al., 1997). However, according to Ruíz-Carranza et al. (1997), this region has been poorly studied, with frogs being a group specially overlooked. Particularly since Ruíz-Carranza et al. (1997) work, only four new species of the genus *Pristimantis* have been described from the surrounding areas, specifically from the western flank of the Cordillera Occidental, in the municipalities of Urao —*P. urani*—, Jardín, Andes —*P. ferwerdai* and *P. postducheminorum*— and Risaralda —*P. blasi*— (Amézquita et al., 2019; Duarte-Marin et al., 2022; Palacios-Rodríguez et al., 2022; Rivera-Correa & Daza, 2016). Specifically for the Carmen de Atrato municipality, there are six species of *Pristimantis* historically reported: *P. erythropleura*, *P. gracilis*, *P. orpacobates*, *P. restrepoi*, *P. ruedai* and *P. w-nigrum* (Ruíz-Carranza et al., 1997). Based on a literature review focused on Carmen de Atrato, since Ruíz-Carranza et al. (1997) no research has been published for frogs of the genus *Pristimantis* which, as mentioned above, have

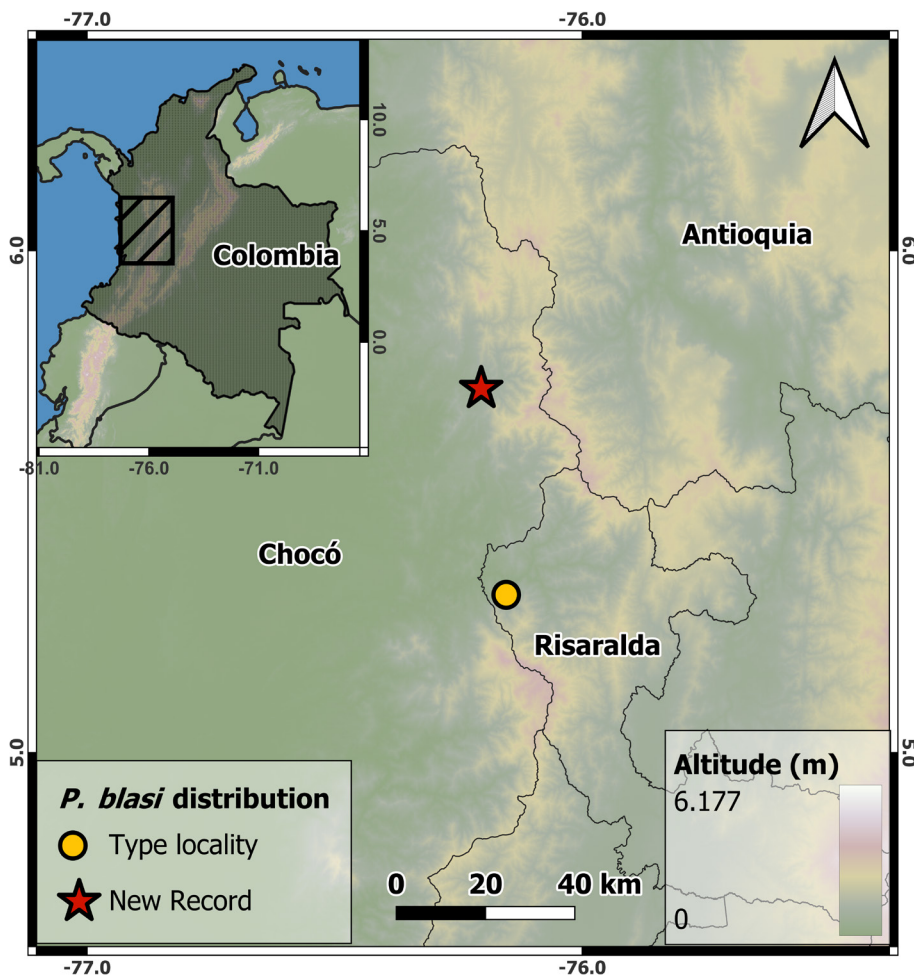


Figura 2. Mapa de la distribución actual de *Pristimantis blasi* para el país. Mostrando la localidad tipo (círculo amarillo) y la nueva localidad reportada en este estudio (estrella de color rojo).

Figure 2. Map of the current distribution of *Pristimantis blasi* for the country, showing the type locality (yellow circle) and the new locality reported in this study (red star).

a particularly high species richness. As sampling in these areas progresses, it is very likely that interesting and novel findings will continue to be documented, and species will continue to be reported in this exceptionally diverse region.

Given this record and the distribution patterns exhibited by several species of *Pristimantis* in this region of the Western Cordillera, it is highly probable that *P. blasi* can be found in localities further north and/or further south of Santa Cecilia and Carmen de Atrato. For example, species such as *P. aurantiguttatus*, *P. orpacobates*, *P. polychrus*, *P. restrepoi* and *P. ruedai* were originally described for localities in the municipalities of Urrao and Frontino (department of Antioquia) and have been recorded much further south in the departments of Risaralda and Valle del Cauca (Ruíz-Carranza et al., 1997). Likewise, something similar occurs with species originally described for localities in departments towards the south of the country (e.g., Risaralda, Valle del Cauca and Cauca), which have been reported further north in Antioquia, as is the case with *P. acatallelus*, *P. brevifrons*, *P. gracilis* and *P. quantus* (Grisales-Martínez & Rendón-Valencia, 2022; Ruiz-Carranza et al., 1997), showing, how the species of the genus can be widely distributed, in this case over entire western flank of the Cordillera Occidental. For us, the lack of records of *P. blasi* in other localities can be explained in the first instance by the lack of current sampling along the Western Cordillera, an area that despite its diversity is still subsampled (Duarte-Marín et al., 2022). *Pristimantis blasi* was tentatively categorized by its authors as an endangered species and endemic to Colombia (Duarte-Marín et al., 2022). Endemic and endangered, by definition, are species that have very restricted and poorly known distributional ranges, and therefore more susceptible to disappearance due to habitat alterations (Malanosky et al., 2024; Zúniga-Baos & de Los Ríos, 2023). In addition, studies on the geographic distribution of these species generally lack coverage, as it is traditionally considered that a short distance is not novel for the extension of the distribution of a species thus contributing to the Wallacean shortfall (Ficetola et al., 2014; Serrano et al., 2023). However, a range extension of 60 km is superbly important for endangered species as it allows to better map its Extent of occupancy —EOO— and area of occupancy —AOO— (Ficetola et al., 2014; Serrano et al., 2023; Zúniga-Baos & de Los Ríos, 2023). And in turn it is an important step towards the validation of the threat status of this species and provides a better understanding of the distribution patterns of this restricted species (Ficetola et al., 2014; Serrano et al., 2023; Zúniga-Baos & de Los Ríos, 2023). Ultimately, we invite other researchers interested in amphibians, a very vulnerable group in Colombia, to make distributional contributions that will allow us

to construct the AOO and EOO of threatened species to generate concise conservation plans.

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LITERATURE CITED

- Acosta-Galvis, A.R., A.M. Saldarriaga-Gómez, B. Ramírez & M. Vargas-Ramírez. 2020. A new Terrarana frog of genus *Pristimantis* from an unexplored cloud forest from the eastern Andes, Colombia. *Zookeys* 961:129-156.
- Amézquita, A., G. Suárez, P. Palacio-Rodríguez, I. Beltrán, C. Rodríguez-López, L.S. Barrientos, J.M. Daza & L. Mazariegos. 2019. A new species of *Pristimantis* (Anura: Craugastoridae) from the cloud forests of Colombian western Andes. *Zootaxa* 4648:537-548.
- Chaparro, J.C., F.P. Condori, L. Mamani & J.L. Deichmann. 2015. New geographic and altitudinal range extension of the rare *Pristimantis divnae* Lehr & von May 2009 (Anura:Craugastoridae) in Peru. *Check List* 11:1-4.
- Duarte-Marín, S., M. Montoya-Marín & J. Rivera-Gómez. 2022. A New Species of Red-eyed frog of the genus *Pristimantis* (Anura: Strabomantidae) from the Western Slope of the Cordillera Occidental, Risaralda, Colombia. *Zootaxa* 5093:218-232.
- Ficetola, G.F., C. Rondinini, A. Bonardi, V. Katariya, E. Padoa-Schioppa, & A. Angulo. 2014. An evaluation of the robustness of global amphibian range maps. *Journal of Biogeography* 41:211-221.



- Frost, D.R. 2024. Amphibian Species of the World: An Online Reference. Version 6.2. at <https://amphibiansoftheworld.amnh.org/index.php>. American Museum of Natural History, New York, USA [Consulted on August 2024].
- Grisales-Martínez, F.A & B.E. Rendón-Valencia. 2022. New distribution record of endangered and endemic frog *Pristimantis quantus* (Lynch, 1998) in western Andes of Colombia. Cuadernos de Herpetología 36:119-122.
- Lindken, T., C.V. Anderson, D. Ariano Sánchez, G. Barki, C. Biggs, P. Bowles, R. Chaitanya, D. Cronin, S. Jähnig, J.M. Jeschke, R. Kennerley, T.E. Lacher Jr, J.A. Luedke, C. Liu, B. Long, D. Mallon, G. Martin, S. Meiri, S. Pasachnik, V.H. Reynoso, C.V. Stanford, P.J. Stephenson, K.A. Tolley, O. Torres-Carvajal, D.L. Waldien, J.C.Z. Woirnaski & T. Evans. 2024. What factors influence the rediscovery of lost tetrapod species? Global Change Biology 30:e17107.
- Malanosky, C.M., A. Farnsworth, D.J. Lunt, P.J. Valdes & E.E. Saupe. 2024. Climate change is an important predictor of extinction risk on macroevolutionary timescales. Science 383:1130-1134.
- McDiarmid, R.W. 2006. Preparación de Anfibios como Especímenes Científicos. En Angulo, A., J.V. Rueda-Almonacid, J.V. Rodríguez-Mahecha & E. La Marca (Eds.). Técnicas de Inventario y Monitoreo para los Anfibios de la Región Tropical Andina. Conservación Internacional. Serie Manuales de Campo N°2. Panamericana Formas e Impresos S.A, Bogotá, Colombia.
- Palacios-Rodríguez, P., J.M. Daza, L.A. Mazariegos-H, U. Rendón & A. Amézquita. 2022. A new species of *Pristimantis* (Anura: Strabomantidae) with a colourful venter from the cloud forests of Colombian western Andes. Zootaxa 5092:67-84.
- Pisani, G.R. 1973. A Guide to Preservation Techniques for Amphibians and Reptiles. Society for the Study of Amphibians and Reptiles. Herpetological Circular 1, Lawrence, Kansas, USA.
- Ruíz-Carranza, P.M., J.D. Lynch & M.C. Ardila-Robayo. 1997. Seis nuevas especies de *Eleutherodactylus* Duméril, Bibron, 1841 (Amphibia: Leptodactylidae) del Norte de la Cordillera Occidental de Colombia. Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales 21:155-174.
- Rivera-Correa, M. & J.M. Daza. 2016. Molecular phylogenetics of the *Pristimantis lacrimosus* species group (Anura: Craugastoridae) with the description of a new species from Colombia. Acta Herpetológica 11:31-45.
- Reyes-Puig, C., M.H. Yáñez-Muñoz, J.A. Ortega & S. Ron. 2020. Phylogenetic relationships of the subgenus *Hypodictyon* (Anura: Strabomantidae: *Pristimantis*) with the description of three new species from the Chocó region. Revista Mexicana de Biodiversidad 91:1-38.
- Serrano, F.C., J.P.S. Vieira-Alencar, J.C. Díaz-Ricaurte, P.H. Valdujo, M. Martins & C. Nogueira. 2023. The Wallacean Shortfall and the role of historical distribution records in the conservation assessment of an elusive Neotropical snake in a threatened landscape. Journal for Nature Conservation 72:126350.
- Zúñiga-Baos, J.A & L.M. de Los Ríos. 2023. Nuevo registro de *Andinobates dorisswansonae* (Rueda, Rada, Sánchez, Velásquez & Quevedo 2006) (Anura, Dendrobatidae) para el Departamento del Tolima, Colombia. Boletín Chileno de Herpetología 10:42-45.

