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# Two New Records of Frogs from Southwestern Colombia

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The Chocó biogeographic province in western Colombia is one of the world's most biodiverse regions (Myers et al. 2000; Rodríguez-Mahecha et al. 2004). It features a high diversity of amphibians, including both endemic and widely distributed species (Lynch and Suárez-Mayorga 2004). A total of 157 amphibian species have been documented in this

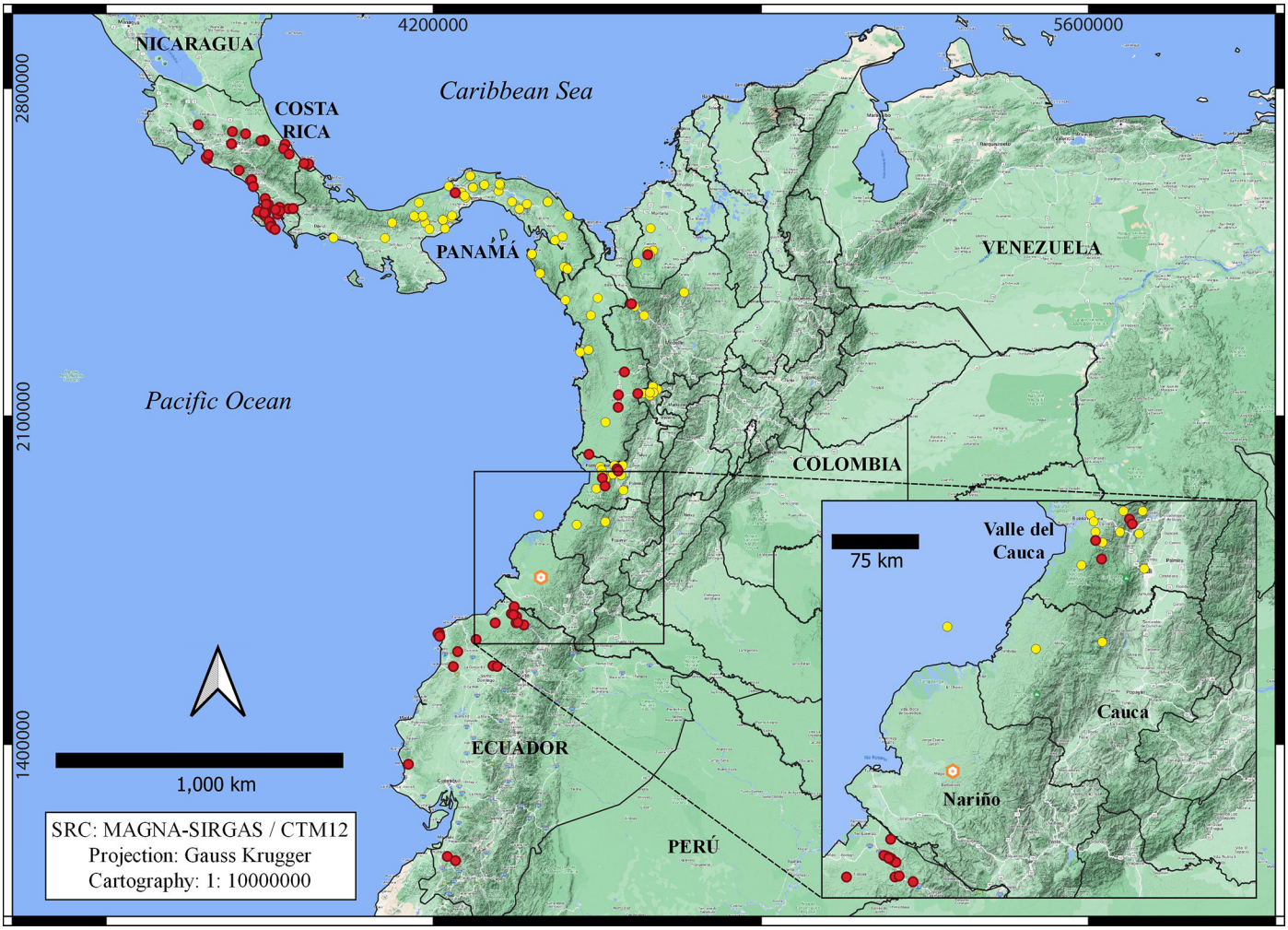


**Figure 1.** The geographic distributions of the Gliding Leaf Frog (*Agalychnis spurrelli*) (red dots) and Rusty Rubber Frog (*Strabomantis bufoniformis*) (yellow dots) in South America. The new locality for both species at Magüi-Payán, Nariño, southwestern Colombia, is indicated by the orange symbol.





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region to date (Pinto-Erazo et al. 2020), with diversity highest in the northern Chocoan region (Lynch and Suárez-Mayorga 2004). The comparatively lower diversity of amphibians to the south, including in Cauca and Nariño Departments, stems largely from a paucity of biological inventories; consequently, amphibian specimens from this region are relatively scarce in herpetological collections (Lynch and Suárez-Mayorga 2004). The few amphibian surveys conducted in this region (Urbina-Cardona and Londoño-Murcia 2003; Mueses-Ciseneros and Moreno-Quintero 2011; Castro-Herrera et al. 2012; Pisso-Flórez et al. 2018; Pinto-Erazo et al. 2020) have addressed only very small areas. However, biological collections provide an alternative source of information for generating regional lists. Herein, based on specimens collected more than 30 years ago, we present new records of two anuran species, the Gliding Leaf Frog, *Agalychnis spurrelli* Boulenger 1913, and the Rusty Robber Frog, *Strabomantis bufoniformis* (Boulenger 1896), from the tropical rainforest of the Pacific lowlands in Nariño Department. These records represent new additions to the recorded amphibian fauna of southwestern Colombia.

These frogs were collected by J.M. Renjifo during visual encounter surveys (Crump and Scott 1994) in the municipality of Magüí Payán, Santo Domingo Village, Nariño Department (1.7636306, -78.17805; elev. 42 m asl; Fig. 1), part of the tropical wet forest life zone (*sensu* Holdridge 1971) with a hydrology affected by several wetlands associated with the Patía River Basin. The specimens examined are in the amphibian collection of the Instituto de Investigaciones Biológicas Alexander von Humboldt (IAvH-Am), at Villa de Leyva, Boyacá Department, Colombia. To confirm the identity of these specimens, we recorded snout-vent length (SVL), head width (HW), head length (HL), eye-nostril length (ENL), eye diameter (ED), interorbital distance (IOD), tympanum diameter (TD), tibia length (TiL), tarsal length (TaL), and foot length (FL), and compared those data to information in Lynch (1975), Cannatella (1980), Lynch and Myers (1983), Lynch and Duellman (1997), Duellman (2001), Duellman and Lehr (2009), Savage (2002), and Ortega-Andrade (2008). Taxonomic determinations were verified by Cesar L. Barrio-Amorós (CRWild, Costa Rica) and Marvin A. Anganoy-Criollo (University of Sao Paulo, Brazil). Distributional data for both species were obtained from Ron et al. (2022), Acosta-Galvis (2023), and GBIF (2023).

The specimens IAvH-Am-9964–5 were identified as *A. spurrelli* by their medium to large size (SVL = 85.3–86.6 mm) (Table 1, Fig. 2) and relatively small heads (HL/SVL = 32.4–34.6%), almost as wide as long (HW/HL = 91.3–95.6%); small tympanic annuli without tympanic membranes, exceed-

**Table 1.** Morphometric data of specimens of Gliding Leaf Frogs (*Agalychnis spurrelli*) and Rusty Rubber Frogs (*Strabomantis bufoniformis*) from Magüi-Payán, Nariño, southwestern Colombia. All measurements are in millimeters (mm).

| **Character** | ***Agalychnis spurrelli*** | | ***Strabomantis bufoniformis*** | | |
|---|---|---|---|---|---|
| | **IAvH-Am-9964** | **IAvH-Am-9965** | **IAvH-Am-9955** | **IAvH-Am-9956** | **IAvH-Am-9957** |
| Sex | Female | Female | Female | Unsexed | Unsexed |
| Snout-vent length (SVL) | 86.6 | 85.3 | 86.2 | 40.7 | 70.2 |
| Head width (HW) | 26.9 | 26.9 | 38.6 | 19.4 | 30.3 |
| Head length (HL) | 28.1 | 29.5 | 36.4 | 19.7 | 29.1 |
| Eye-nostril length (ENL) | 9.2 | 9.0 | 11.9 | 6.6 | 9.3 |
| Interorbital distance (IOD) | 9.0 | 10.4 | 9.4 | 4.1 | 7.5 |
| Eye diameter (ED) | 7.2 | 7.6 | 11.0 | 8.0 | 10.2 |
| Tympanum diameter (TD) | 4.8 | 4.7 | 5.3 | 3.3 | 4.4 |
| Tibia length (TiL) | 43.2 | 43.6 | 54.0 | 26.2 | 44.2 |
| Foot length (FL) | 29.0 | 27.3 | 42.8 | 24.7 | 35.8 |
| Tarsal length (TaL) | 29.2 | 30.5 | 27.9 | 14.5 | 25.2 |
| HL/SVL (%) | 32.4 | 34.6 | 42.3 | 48.3 | 41.4 |
| HW/HL (%) | 95.6 | 91.3 | 106.0 | 98.9 | 104.3 |
| ENL/HL (%) | 32.8 | 30.5 | 32.6 | 33.7 | 31.9 |
| IOD/HW (%) | 33.4 | 38.6 | 24.4 | 21.0 | 24.8 |
| TD/ED (%) | 67.2 | 61.4 | 48.7 | 41.6 | 43.1 |
| LiT/SVL (%) | 49.8 | 51.1 | 62.7 | 64.4 | 63.1 |
| FL/SVL (%) | 33.4 | 32.0 | 49.7 | 60.8 | 51.1 |
| LaT/SVL (%) | 33.4 | 32.0 | 49.7 | 60.8 | 51.1 |

**Figure 2.** Preserved specimens of the Gliding Leaf Frog (*Agalychnis spurrelli*) (female, IAvH-Am-9965) (top) and Rusty Rubber Frog (*Strabomantis bufoniformis*) (unsexed, IAvH-Am-9957) (bottom) from Magüi-Payán, Nariño, southwestern Colombia. Photographs by Andrés Aponte (IAvH). Scale bars = 5 cm.

ing slightly half of the eye diameter (TD/ED = 61.4–67.2%); short snout (ENL/HL = 30.5–32.8%), acuminated in dorsal and lateral views; forearms considerably thicker than arms, and legs long and slender (TiL/SVL = 49.8–51.1%); palmar and heel tubercles absent. Both specimens were easily distinguishable from the Flecked Leaf Frog, *Agalychnnis psilopygion* (Cannatella 1980), by larger size and extensive hand webbing, and from the sympatric Splendid Leaf Frog, *Cruziohyla calcarifer* (Boulenger 1902), by the acuminated snout in lateral view and lack of heel tubercles.

Records of *S. bufoniformis* were based on three specimens (IAvH-Am-9955–57), one apparent subadult and two adults with SVLs of 40.7 and 86.2 mm (Table 1, Fig. 2). These specimens were identified as *S. bufoniformis* by large heads, two-fifths to one-half of body lengths (HL/SVL = 42.3–48.3%) and wide or wider than long (HW/HL = 98.9–106%); short snouts, sub-acuminated in dorsal view and rounded in lateral view; presence of tympanic annuli and membranes, reaching two-fifths to one-half of eye diameter (TD/ED = 41.6–48.7%); presence of upper eyelid tubercles, never elongated; heavily tuberculate dorsal skin; ulnar tubercles not enlarged; fingers lacking lateral fringes and webbing, with discs and pads slightly expanded laterally; toes with lateral fringes, basal webbing, and considerably expanded discs and pads; and inner tarsal folds usually absent or very faint. Specimens were easily distinguished from the Anatipes Robber Frog, *Strabomantis anatipes* (Lynch and Myers 1983), the Chocó Robber Frog, *Strabomantis anomalus* (Boulenger 1989), and the Palma Real Robber Frog, *Strabomantis cerastes* (Lynch 1975), by body size (maximum SVL = 55.8 mm in *S. cerastes*), as well as the presence of basal foot webbing (distal foot web in *S. anatipes*, absent in *S. cerastes*), lack of elongated upper eyelid tubercles (absent in *S. anatipes*, elongated in *S. anomalus*), ulnar tubercles (absent in *S. anatipes*), and finger discs and pads (absent in *S. anatipes* and *S. anomalus*).

The presence of these species in the Patía River Basin represents two novel additions to the amphibian fauna of Nariño Department, which now has 127 species (including the two recorded herein). These records also fill a distributional gap of 323 km for *A. spurrelli* between the southernmost record in Valle del Cauca Department, Colombia, to Esmeraldas Province, Ecuador (Ortega-Andrade 2008; Ron et al. 2022; Acosta-Galvis 2023). These records *of S. bufoniformis* represent the southernmost locality known for the spe-

cies and extend its range 132.7 km south from the closest locality, Gorgona Island, Cauca Department, where this species is considered locally extinct, as the most recent record dates to 1987 (Urbina-Cardona and Londoño-Murcia 2003; Castro-Herrera et al. 2012). The closest mainland record is from Timbiquí, Cauca Department, 135.8 km northwest of the new record (Lynch and Suárez-Mayorga 2004). Given the age of these records and the absence of information on these species over the last 30 years, populations likely have declined over the past decades. Systematic fieldwork at the localities from which our specimens were collected is needed to evaluate the current status of the populations of these two species.

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