

Catalogue of American Amphibians and Reptiles.

Ramírez, J.P., M.P. Ramírez-Pinilla, and J.E. Ortega.
2012. *Bolitoglossa nicefori*.

***Bolitoglossa nicefori* Brame and Wake
San Gil Mushroom-tongue Salamander**

Bolitoglossa adspersa: Niceforo-Maria 1958:26
(part).

B. [Bolitoglossa] sp.: Wake and Brame 1963:384



FIGURE 1. An adult male *Bolitoglossa nicefori* from Hacienda El Roble, Los Santos Municipality, Santander, Colombia (above). An adult female *Bolitoglossa nicefori* brooding her clutches (below).

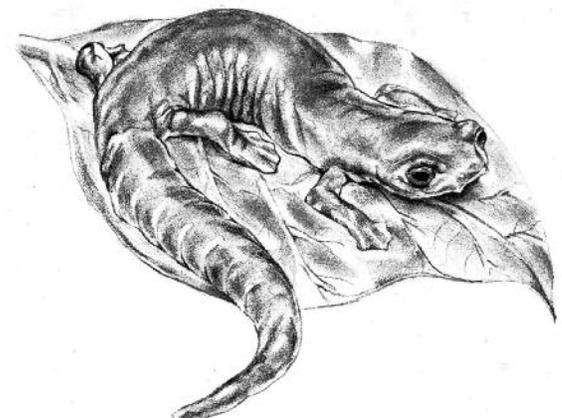


FIGURE 2. *Bolitoglossa nicefori* from Hacienda El Roble, Los Santos Municipality, Santander, Colombia.

Bolitoglossa nicefori Brame and Wake 1963:3. Type-locality: "14 km N [should be northeast of] San Gil, 1500 meters (4900 feet) elevation, Departamento de Santander, Colombia". Holotype: Museo de La Salle, Bogotá (MLS) 4 (now lost, not examined by the authors), an adult male collected by Hermano Nicéforo María, date of collection unknown.

Bolitoglossa nicefori: Brame, Hochnadel, Smith, and Smith 1978:44. Unjustified emendation.

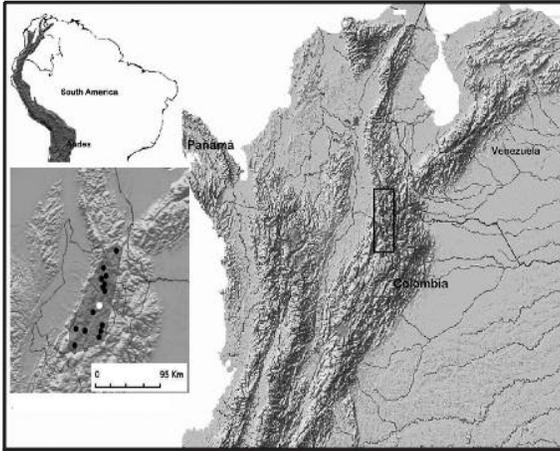
Bolitoglossa (Eladinea) nicefori: Parra-Olea, Garcia-Paris, and Wake 2004:336

• **CONTENT.** This species is monotypic.

• **DEFINITION.** Adult *Bolitoglossa nicefori* is a moderately sized (29–54 mm SVL in adult males, 38–77 mm in adult females) bolitoglossine salamander with extensively webbed hands and feet, digits that lack ventral pads, 16–30 bicuspid teeth on the maxillae, and 8–25 bicuspid teeth on the vomers. The snout is short and rounded in dorsal view and in profile. The nostrils are small, and cirri of the nasolabial grooves are pronounced. The eyes do not protrude from the snout in dorsal view. The body does not taper behind the head; therefore, the neck is not well differentiated. The trunk and limbs are moderately robust. The dorsum is reddish brown with irregular pale reticulations, and the venter is brown with irregular cream markings. Adult males have white testes, a mental gland, and up to three labial teeth.

• **DIAGNOSIS.** *Bolitoglossa nicefori* is distinguished from all the Andean members of the genus in Colombia as follows: from *B. tatamae*, *B. walkeri*, *B. hypacra*, *B. valleculea*, *B. adspersa* and *B. hiemalis* in having more webbing of the hands and feet and in lacking digital pads; from *B. altamazonica* in having less webbing and in being larger (*B. altamazonica* males 30.5–46.7 mm SVL, females 43.3–57.8 mm SVL); from *B. capitana* in being smaller (*B. capitana* males 62.7–64.4 mm SVL, females 74–85 mm SVL); from *B. pandi* in lacking a well differentiated neck and a reduced third digit; from *B. lozanoi* in lacking dark mottling on the venter, and in having a pale brown dorsum, a "biseriate" pattern on the side of the head, a cream-colored dorsolateral region, and a slender body; from *B. phalarosoma* in lacking large dorsolateral pale patches and a reduced third finger; from *B. ramosi* in having more extensive webbing of the hands and feet.

• **DESCRIPTIONS.** The only available descriptions of this species are those of Brame and Wake (1963), Acosta-Galvis (2007) and Raffaelli (2007). Dulcey-Cala et al. (2009) described the post-hatching development of the skull in neonates, juveniles and adults. González-León and Ramírez-Pinilla (2009) described the morphology and histology of the mental gland. Cabrera-Tellez et al (2010) described the morphology and post-hatching ontogeny of the autopodial skeleton. González-León and Ramírez-Pinilla (2011) described morphological and histochemical variation in



MAP. Distribution of *Bolitoglossa nicefori*. The circle marks the type-locality and the dots mark other known locality records.

cloacal structures of males and females related to reproductive activity.

• **ILLUSTRATIONS.** Wake and Brame (1963) provided a sketch of the foot of the holotype, and Brame

and Wake (1963) provided a photograph of the holotype in dorsal view and an illustration in lateral view. Dulcey-Cala et al. (2009) provided sketches of the skull of neonates, juveniles and adults. González-León and Ramírez-Pinilla (2009) provided photographs of mental gland morphology and histology, and González-León and Ramírez-Pinilla (2011) provided photographs of male and female cloacal glands and illustrations of cloacal structures. Cabrera-Tellez et al. (2010) provided photographs and sketches of autopod fore- and hindlimb morphology.

• **DISTRIBUTION.** *Bolitoglossa nicefori* is only known from the western slopes of the Cordillera Oriental of Colombia (Departamentos of Norte de Santander and Santander), at elevations between 1400–2400 m. It inhabits agroecosystems (large plantations of organic coffee) and highly disturbed tropical Andean forests. *Bolitoglossa nicefori* exhibits both terrestrial and arboreal behaviors related to temperature and humidity conditions during the daily cycle. This species is nocturnal and is usually found active at night in herbaceous vegetation; during daylight hours, salamanders are hidden among fallen leaves and trees.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Literature regarding this species is sparse. Nicéforo María (1958) included it under the name *Bolitoglossa adspersa*. Brame and Wake (1963) provided the original description, and Acosta-Galvis (2007) a redescription. Cabrera-Tellez et al. (2010) described skeletal morphology and development, Dulcey-Cala et al. (2009) described skull morphology and development, Ortega et

al. (2009) described diet, microhabitat use and reproduction, and González-León and Ramírez-Pinilla (2009) described mental gland morphology. Cabrera-Tellez et al. (2010) on post-hatching ontogeny of autopodial morphology, and González-León and Ramírez-Pinilla (2011) on female and male cloacal gland morphology and function. Duellman (1999) and Wake (1987) commented on distributional patterns, and Wake and Brame (1966) provided ecological notes. Acosta and Hoyos (2006) included this species as comparative material in the description of a new species of *Bolitoglossa* from Colombia. *Bolitoglossa nicefori* is included in the checklists of Frost (2010) and Frost et al. (2006). Rodríguez (2002) provided a biography of Hermano Nicéforo-María.

• **ETYMOLOGY.** The specific epithet is a patronym honoring the late Antoine Rouhaire (Brother Nicéforo María), a French naturalist who studied the vertebrate fauna of Colombia and who collected the holotype of this species.

• **COMMENT.** This species is included in the *Bolitoglossa (Eladinea) adspersa* group of Parra-Olea et al. (2004). The known geographic distribution of *Bolitoglossa nicefori* is less than 20,000 km² and is therein threatened by habitat loss. Nonetheless, the IUCN lists the species as of Least Concern because individuals are frequently encountered and populations are relatively large (Ramírez-Pinilla et al. 2004).

Recently, a series of relatively large (range 90–101 mm SVL) bolitoglossine salamanders was collected from Tona Municipality (Department of Santander, 07°12' N and 72°57' W, 1500–1700 m elevation). Based on morphology, individuals within this series can be identified as either *B. nicefori* or as *B. capitana*; however, they are considerably larger than any previously collected *B. nicefori*, and are also larger than the largest known *B. capitana*. The discovery of this population suggests that salamanders currently identified as *B. capitana* and *B. nicefori* may be members of the same species (a position that must be considered and subjected to refutation). Thus, a review of both taxa including molecular analyses is needed.

• **ACKNOWLEDGMENTS.** We are grateful to J.D. Lynch who critically reviewed the text and the English, C. Hernández and A. Carmona who collected the new series, E. González for the photographs of the specimens, H. Leal for the illustration, and S. Bolívar for helping to draw the map.

LITERATURE CITED

- Acosta, A.R. 2007. Taxonomía y Evaluación de la Homología de los Caracteres para las Salamandras del género *Bolitoglossa* (Caudata: Plethodontidae) de Colombia. M.Sc. Thesis, Universidad Nacional de Colombia, Bogotá.
- and J.M. Hoyos. 2006. A new species of salamander (Caudata: Plethodontidae: *Bolitoglossa*) from

- the subandean forest Western Cordillera of Colombia. *Herpetologica* 62:302–308.
- Brame, A.H., Jr., R. Hochnadel, H.M. Smith, and R.B. Smith. 1978. Bionumeric codes for amphibians and reptiles of the world. I. Salamanders. *Trans. Kansas Acad. Sci.* 81:43–56.
- and D.B. Wake 1963. The salamanders of South America. *Contrib. Sci. Nat. Hist. Mus. Los Angeles Co.* (69):1–72.
- Cabrera-Téllez, L., O.A. Tarazona, and M.P. Ramírez-Pinilla. 2010. Morphology and posthatching ontogeny of the autopodial skeleton of *Bolitoglossa nicefori* (Caudata: Plethodontidae). *J. Morphol.* 271:1374–1385.
- Duellman, W.E. 1999. Distribution patterns of amphibians in South America, p. 255–328. *In* W.E. Duellman (ed.), *Patterns of Distribution of Amphibians: A Global Perspective*. Johns Hopkins Univ. Press, Baltimore.
- Dulcey-Cala, C.J., O.A. Tarazona, and M.P. Ramírez-Pinilla. 2009. The morphology and post-hatching development of the skull of *Bolitoglossa nicefori* (Caudata: Plethodontidae): developmental implications of recapitulation and repatterning. *Zoology* 112:227–239.
- Frost, D.R. 2010. Amphibian species of the world: an online reference. Version 5.4 (8 April 2010). Electronic database accessible at: <http://research.amnh.org/vz/herpetology/amphibia>. American Museum of Natural History, New York.
- , T. Grant, J. Faivovich, R.H. Bain, A. Haas, C.F.B. Haddad, R.O. de Sá, A. Channing, M. Wilkinson, S.C. Donnellan, C.J. Raxworthy, J.A. Campbell, B.L. Blotto, P. Moler, R.C. Drewes, R.A. Nussbaum, J.D. Lynch, D.M. Green, and W.C. Wheeler. 2006. The amphibian tree of life. *Bull. Amer. Mus. Nat. Hist.* 297:1–370.
- González-León, E. and M.P. Ramírez-Pinilla. 2009. The mental gland of *Bolitoglossa nicefori* (Caudata: Plethodontidae). *Amphib.-Rept.* 30:561–569.
- and –. 2011. Cloacal morphology in *Bolitoglossa nicefori* (Caudata: Plethodontidae): variation during the reproductive cycle. *Anat. Rec.* 294:349–362.
- Nicéforo-María, Hno. 1958. Sección Herpetología. *Bol. Inst. La Salle* 45:1–16.
- Ortega, J.E., J.M. Monares-Riaño, and M.P. Ramírez-Pinilla. 2009. Reproductive activity, diet, and microhabitat use in *Bolitoglossa nicefori* (Caudata: Plethodontidae). *J. Herpetol.* 43:1–10.
- Parra-Olea, G., M. Garcia-Paris, and D.B. Wake. 2004. Molecular diversification of salamanders of the tropical American genus *Bolitoglossa* (Caudata: Plethodontidae) and its evolutionary and biogeographical implications. *Biol. J. Linn. Soc.* 81:325–346.
- Ramírez-Pinilla, M.P., M. Osorno-Muñoz, J.V. Rueda, A. Amezcuita, and M.C. Ardila-Robayo. 2004. *Bolitoglossa nicefori*. *In* IUCN 2006. 2006 IUCN Red List of Threatened Species. <www.iucnredlist.org>.
- Raffaelli, J. 2007. *Les Urodeles du Monde*. Penclen Edition, Plumelec, France. 377 pp.
- Rodríguez, G. 2002. El naturalista Antoine Rouhaire (Hermano Nicéforo María) y el desarrollo de la zoología sistemática en Colombia. *Rev. Acad. Colomb. Cienc.* 26:229–238.
- Wake, D.B. 1987. Adaptive radiation of salamanders in Middle American cloud forests. *Ann. Missouri Bot. Gard.* 74:242–264.
- and A.H. Brame, Jr. 1963. The status of the plethodontid salamander genera *Bolitoglossa* and *Magadigita*. *Copeia* 1963:382–387.
- and –. 1966. Notes on South American salamanders of the genus *Bolitoglossa*. *Copeia* 1966:360–363.

Juan Pablo Ramírez, Martha Patricia Ramírez-Pinilla (mpramir@uis.edu.co), and **Jesús Eduardo Ortega** (chucho.ortega@gmail.com), Colección Herpetológica y Laboratorio de Biología Reproductiva de Vertebrados, Escuela de Biología, Universidad Industrial de Santander, Bucaramanga, Colombia.

Primary editor for this account, Brian T. Miller.

Published 30 April 2012 and Copyright © 2012 by the Society for the Study of Amphibians and Reptiles.
