

Catalogue of American Amphibians and Reptiles.

McCranie, J.R. 2006. *Bolitoglossa diaphora*.

***Bolitoglossa diaphora* McCranie and Wilson**

Bolitoglossa sp.: Anonymous 1994:117.

Bolitoglossa sp. 1: Wilson and McCranie 1994:147.

Bolitoglossa diaphora McCranie and Wilson 1995: 448. Type-locality, "above the visitors center of Parque Nacional El Cusuco, Cerro Cusuco (15°31'N, 88°12'W), 5.6 km WSW Buenos Aires, 1550 m elevation, Sierra de Omoa, Departamento de Cortés, Honduras." Holotype, Museum of Vertebrate Zoology, University of California, Berkeley (MVZ) 221178, an adult male, collected by J.R. McCranie, 21 August 1992 (examined by author).

B[olitoglossa]. (Magnadigita) diaphora: Parra-Olea et al. 2004:336.

• **CONTENT.** No subspecies are recognized.

• **DEFINITION.** *Bolitoglossa diaphora* is a moderately large salamander (SVL 42.4–50.4 mm, mean = 45.9 ± 3.3 mm in 5 adult males, 48.1–51.9 mm, mean = 50.5 ± 2.1 mm in 3 adult females, 29.2–37.0 mm, mean = 34.2 ± 3.5 mm in 4 subadult males, 31.4–38.5 mm, mean = 34.6 ± 2.3 mm in 9 subadult females) with a moderately long and broad head (head length/SVL 0.244–0.262 in adult males, 0.239–0.249 in adult females; head width/SVL 0.153–0.169 in adult males, 0.163–0.177 in adult females). The snout is truncate to broadly rounded in dorsal aspect and broadly rounded in lateral profile. The labial protuberances are well developed in both sexes, and are pronounced in adult males. Adult males have a distinct, oval-shaped mental gland cluster. The eyes are slightly protuberant and are narrowly visible beyond the margin of the jaw when viewed from below in males and are not visible from below in females. The postorbital groove is shallow and extends posteriorly from the eye before turning sharply ventrally to connect with the gular fold, and another groove proceeds sharply ventrally just posterior to the lower jaw and extends irregularly across the throat anterior to the gular fold. There is no sublingual fold. The maxillary teeth number 45–65 (52.8 ± 7.9) in adult males, 43–55 (49.3 ± 6.0) in adult females, and extend posteriorly to a level about three-fourths through the length of the orbit. The vomerine teeth number 23–32 (27.0 ± 3.9) in adult males, 23–30 (27.0 ± 3.6) in adult females, and are in slightly irregular arched series to irregular patches that extend laterally to the level of the outer edge of the choanae. The premaxillary teeth number 2–4 (3.2 ± 0.8) in adult males, 5–8 (6.7 ± 1.5) in adult females. The premaxillary teeth are enlarged and pierce the lip in adult males and are not enlarged and are located posterior to the lip and in line with the maxillary series in all females. The costal grooves number 13. The tail is nearly rectangular in cross section anteriorly, becoming ovoid to laterally flattened and quickly tapering for the distal one-third of its



Figure 1. Adult male holotype (MVZ 221178; above) and adult female (USNM 523278; below) of *Bolitoglossa diaphora* (both photographs by the author).



length. The tail is strongly constricted basally and relatively short (tail length/SVL 0.431–0.719 in adult males, 0.607–0.608 in 2 adult females). The limbs are relatively slender and moderately long (hind limb length/SVL 0.263–0.293 in adult males, 0.241–0.260 in adult females). The adpressed limb interval is about 0.5 costal folds in adult males and about 1.0 costal folds in adult females. The feet are moderately large (hind foot width/SVL 0.083–0.113 in adult males, 0.087–0.092 in adult females). The digits are extensively webbed, with the indentation in webbing between toes III–IV on both the fore- and hind limbs occasionally reaching distally as far as the level of the second segment of toe III. The protruding toe tips are acutely rounded to pointed, and all toe tips lack subdigital pads. The relative length of the toes on the forelimbs is I<IV<II<III, whereas that on the hind limbs is I<V<II<IV<III. A fairly distinct to barely evident postiliac gland cluster is present. Males have cloacal papillae and females have cloacal folds (the above from data taken by McCranie, most of which was published in McCranie and Wilson 1995, 2002).

McCranie and Wilson (1995), using Smithe (1975–1981) for color names (capitalized) and color codes (in parentheses), described the color in life of the adult male holotype (MVZ 221178) as follows: "all dorsal surfaces uniformly Vandyke Brown (121); lateral surfaces Vandyke Brown with Vinaceous Pink (221c) mottling and tiny white spots; lateral surface of tail with scattered small white spots; ventral surfaces of head, body, and tail white with heavy dark brown mottling plus some scattered Vinaceous Pink mottling, especially on subcaudal surface." One adult male paratype (USNM 335045) and the subadult male paratype (USNM 335046) were indistinguishable from the male holotype in color pattern in life. McCranie and Wilson (1995) described color in life for each of 3 subadult female paratypes as follows: "USNM 335048 - dorsum Cinnamon (123a) with dark brown flecking heavily concentrated on head, middorsum, and tail; lateral surfaces Cinnamon with dark brown mottling on body and tail, especially heavy on latter; venter of body and tail Vinaceous Pink (221c) with dark brown mottling and tiny white spots; chin

and throat dark brown with Vinaceous Pink mottling plus tiny white spotting. USNM 335047 - dorsum Pratt's Rufous (140) with dark brown flecks, flecks concentrated on head and tail, anterior portion of tail with slightly paler blotching; lateral surfaces of body Pratt's Rufous with Vinaceous Pink (221c) mottling and dark brown flecking; lateral surface of tail heavily flecked with dark brown; ventral surfaces white with dark brown flecking, flecking heavy along midventer of body. MVZ 221180 was similar to USNM 335047 except that the tail blotching was not prominent and less dark brown flecking was present on the lateral surface of the tail." Color in life of an adult female (MVZ 225844) was described as follows by McCranie and Wilson (2002): "dorsal surfaces of head and body Chestnut (32), with paler brown flecking; dorsal and lateral surfaces of tail dark Chestnut (32); sides of head and body and dorsal surfaces of limbs Ferruginous (41); ventral surfaces Ferruginous (41); iris chocolate brown with heavy gold flecking."

Color in alcohol of the male holotype (MVZ 221178) was described as follows by McCranie and Wilson (1995): "dorsal surfaces of head, body, and tail uniformly lead gray; lateral surfaces slightly paler because of numerous tiny pale spots; ventral surfaces of head, body, and tail a dirty white ground color with numerous dark brown flecks, flecks distributed rather evenly throughout, though some pale patches exist, especially on subcaudal surface." McCranie and Wilson (2002) noted that all males are relatively similarly colored in alcohol. Color in alcohol of both an adult female paratype (MVZ 186764) and a subadult female paratype (USNM 335047) were similar to each other and was described as follows by McCranie and Wilson (1995): dorsum of body pale tan with dark brown flecking, flecking forming small, very irregular spots in areas of heavy concentration, brown flecking on head and tail dominating pale color; dorsal surfaces of feet pale tan with dark brown flecking; ventral surfaces pale tan with dark brown mottling on chin, midventer, around vent, and mid-length of subcaudal surface."

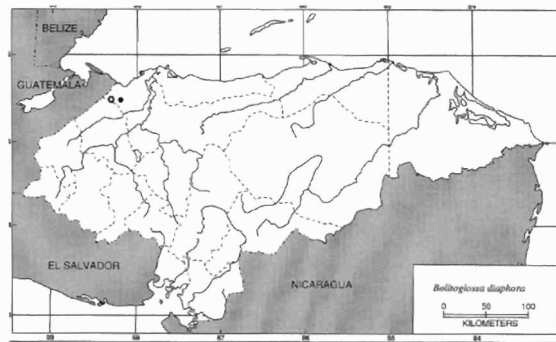
• **DIAGNOSIS.** *Bolitoglossa diaphora* is a member of the *B. dunnii* species group of the subgenus *Magnadigita* Taylor 1944 (Parra-Olea et al. 2004). Eleven described species were included in this species group by Parra-Olea et al. (2004) and two more species have been subsequently described (Greenbaum 2004, McCranie et al. 2005). The extensively webbed feet that lack subdigital toe pads, the sexually dimorphic color pattern, and the short tail length will distinguish *B. diaphora* from all other known species in the *B. dunnii* group.

• **DESCRIPTIONS.** Detailed descriptions of external morphology are in McCranie and Wilson (1995, 2002). McCranie and Wilson (1995) also described some osteological features.

• **ILLUSTRATIONS.** Color photographs of the adult male holotype and an adult female are in McCranie and Wilson (2002). Black-and-white photographs of

the holotype and a subadult female paratype are in McCranie and Wilson (1995). Line drawings of phalangeal structure of a forefoot and a hind foot are in McCranie and Wilson (1995). McCranie and Wilson (2002) included a habitat photograph taken in the vicinity of one of the collecting sites for this species.

• **DISTRIBUTION.** *Bolitoglossa diaphora* is known only from a few localities in the Sierra de Omoa to the west of San Pedro Sula, Cortés, in northwestern Honduras. The known elevational range is 1470–2200 m in primary to slightly disturbed cloud forest (Lower Montane Wet Forest formation of Holdridge 1967).



Map. Distribution of *Bolitoglossa diaphora*. The circle denotes the type-locality as well as several other nearby localities and the dot two nearby localities.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** What little is known about the natural history of this species was discussed by McCranie and Wilson (1995, 2002) and its distribution by Honduran physiographic and ecogeographic regions was presented by McCranie and Wilson (2002) and Wilson et al. (2001). Wilson and McCranie (2003) discussed its status as an "indicator species" used to measure environmental stability and these authors considered the species to be highly vulnerable. Wilson and McCranie (2004a) discussed its conservation status and also considered the species to be highly vulnerable, and Wilson and McCranie (2004b) discussed its distribution within the Honduran cloud forests. Wilson and McCranie (2004c) presented information on its occurrence in Parque Nacional El Cusuco. Parra-Olea et al. (2004) studied its mitochondrial DNA and presented a phylogenetic analysis of its relationships among the genus *Bolitoglossa* that placed it in the *B. dunnii* species group. Parra-Olea et al. (2004) also placed the species in the subgenus *Magnadigita* Taylor (1944). The species was included in diagnoses of new species of *Bolitoglossa* by Greenbaum (2004, in his Table 1), McCranie and Cruz (1996), and McCranie et al. (2005). Greenbaum (2004) also reproduced the figure of the "*Magnadigita*" clade previously published in Parra-Olea et al. (2004). McCranie et al. (2005) included a map showing the known localities of this species and the remaining members of the *B. dunnii* group in Honduras. Duellman (2001) listed the species as occurring in the Eastern Nuclear Highlands of Middle Am-

erica and Campbell (1999) listed the species in various tables concerning distributional patterns of amphibians in Middle America. Larson et al. (2003) listed the species as a member of the subfamily Plethodontidae, tribe Bolitoglossini, in the genus *Bolitoglossa*, and also included it in the *B. dunnii* group. Duellman and Schlager (2003) included it in their valid species list. Rodríguez-Robles et al. (2003) included the holotype and several paratypes in their catalogue of MVZ type specimens.

• **ETYMOLOGY.** The name *diaphora* is from the Greek ΔΙΑΦΟΡΟΣ and means different. The name refers to the “strikingly different colors and patterns exhibited by males and females of this taxon” (McCranie and Wilson 1995).

• **COMMENT.** Museum acronyms follow Leviton et al. (1985).

LITERATURE CITED

- Anonymous. 1994. Evaluación Ecológica Rápida (EER) Parque Nacional “El Cusuco” y Cordillera del Merendón. Fundac. Ecol. “Hector Rodrigo Pastor Fasquelle,” San Pedro Sula.
- Campbell, J.A. 1999. Distribution patterns of amphibians in Middle America, p. 111–210. In W.E. Duellman (ed.), *Patterns of Distribution of Amphibians: A Global Perspective*. John Hopkins Univ. Press, Baltimore, Maryland.
- Duellman, W.E. 2001. The Hylid Frogs of Middle America. SSAR Contrib. Herpetol., Vol. 18. Ithaca, New York.
- and N. Schlager (eds.). 2003. *Grzimek’s Animal Life Encyclopedia*. Second Edition. Vol. 6. Amphibians. Gale Group, Farmington Hills, Michigan.
- Greenbaum, E. 2004. A new species of *Bolitoglossa* (Amphibia: Caudata: Plethodontidae) from montane forests in Guatemala and El Salvador. *J. Herpetol.* 38:411–421.
- Holdridge, L.R. 1967. *Life Zone Ecology*. Revised Edition. Trop. Sci. Center, San José, Costa Rica.
- Larson, A., D.W. Weisrock, and K.H. Kozak. 2003. Phylogenetic systematics of salamanders (Amphibia: Urodela), a review, p. 31–108. In D.M. Sever (ed.), *Reproductive Biology and Phylogeny of Urodela*. Science Publ., Inc. Enfield, New Hampshire.
- Leviton, A.E., R.H. Gibbs, Jr., E. Heal, and C.E. Dawson. 1985. Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia* 1985:802–821.
- McCranie, J.R. and G.A. Cruz. 1996. A new species of the *Bolitoglossa dunnii* group (Caudata: Plethodontidae) from the Sierra de Agalta. *Carib. J. Sci.* 32:195–200.
- , M.R. Espinal, and L.D. Wilson. 2005. A new species of montane salamander of the *Bolitoglossa dunnii* group from northern Comayagua, Honduras (Urodela: Plethodontidae). *J. Herpetol.* 39: 108–112.
- and L.D. Wilson. 1995. A new species of salamander of the genus *Bolitoglossa* (Caudata: Plethodontidae) from Parque Nacional El Cusuco, Honduras. *J. Herpetol.* 29:447–452.
- and –. 2002. *The Amphibians of Honduras*. SSAR Contrib. Herpetol., Vol. 19. Ithaca, New York.
- Parra-Olea, G., M. García-París, 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.
- Rodríguez-Robles, J.A., D.A. Good, and D.B. Wake. 2003. Brief history of herpetology in the Museum of Vertebrate Zoology, University of California, Berkeley, with a list of type specimens of recent amphibians and reptiles. *Univ. California Publ. Zool. Vol.* 131.
- Smithe, F.B. 1975–1981. *Naturalist’s Color Guide*. Part I. Color Guide. Amer. Mus. Nat. Hist., New York.
- Taylor, E.H. 1944. The genera of plethodont salamanders in Mexico, Pt. I. *Univ. Kansas Sci. Bull.* 30: 189–232.
- Wilson, L.D. and J.R. McCranie. 1994. Second update on the list of amphibians and reptiles known from Honduras. *Herpetol. Rev.* 25:146–150.
- and –. 2003. Herpetofaunal indicator species as measures of environmental stability in Honduras. *Carib. J. Sci.* 39:50–67.
- and –. 2004a. The conservation status of the herpetofauna of Honduras. *Amphib. Rept. Conserv.* 3(1):6–33.
- and –. 2004b. The herpetofauna of the cloud forests of Honduras. *Amphib. Rept. Conserv.* 3(1):34–48.
- and –. 2004c. The herpetofauna of Parque Nacional El Cusuco, Honduras (Reptilia, Amphibia). *Herpetol. Bull.* 87:13–24.
- , –, and M.R. Espinal. 2001. The ecogeography of the Honduran herpetofauna and the design of biotic reserves, p. 109–158. In J.D. Johnson, R.G. Webb, and O. Flores-Villela (eds.), *Mesoamerican Herpetology: Systematics, Zoogeography, and Conservation*. Centennial Mus., Univ. Texas El Paso, Special Publ. (1).

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