

A New Banded Snake of the Genus *Tropidophis* (Tropidophiidae) from North-Central Cuba

S. BLAIR HEDGES,^{1,2} ORLANDO H. GARRIDO,³ AND LUIS M. DÍAZ³

¹Department of Biology, 208 Mueller Lab, Pennsylvania State University, University Park, Pennsylvania 16802, USA;
E-mail: sbh1@psu.edu

³Museo Nacional de Historia Natural, Capitolio, La Habana, Cuba

ABSTRACT.—A new species of *Tropidophis* is described from the province of Villa Clara in north-central Cuba. It has a buff ground color with bold brown spots fused to form zebra-like bands. In scalation and coloration it differs from all other species in the genus, but is tentatively placed in the *Tropidophis maculatus* group.

RESUMEN.—Se describe una nueva especie de *Tropidophis* de la provincia de Villa Clara al norte de la región central de Cuba. Es una especie de color casi beige con marcadas manchas pardas que están unidas entre sí semejantes al patrón de una zebra. Se diferencia de todas las especies del género en base a la escamación y a la coloración. Tentativamente lo situamos en el grupo *Tropidophis maculatus*.

Neotropical snakes of the genus *Tropidophis* (Tropidophiidae) include 15 recognized West Indian species and three mainland species (Peters and Orejas-Miranda, 1970; Powell et al., 1996; Hedges et al., 1999; Hedges and Garrido, 1999). Twelve species occur on the island of Cuba, six of which are sympatric in different regions of the island (Hedges and Garrido, 1999). These snakes are less frequently encountered than most reptiles and, except for a few common species, are not well represented in museum collections. Several species groups are recognized based on morphology (Schwartz and Marsh, 1960; Hedges and Garrido, 1992), although molecular analyses (Hedges, 1996; Hass et al., 2001) suggest some major rearrangements are warranted in the recognition of these groups.

Recently, the curator of herpetology of the Institute of Ecology and Systematics of Havana, L. V. Moreno, drew our attention to two unusual specimens of *Tropidophis*. Both were collected in a cave (near the entrance) close to the town of Caguanes, Villa Clara Province, Cuba, and are similar in coloration and scalation, yet they differ significantly from other described species in the genus.

MATERIALS AND METHODS

Snout-vent length and tail length measurements were taken to the nearest millimeter; other length measurements were made with a digital micrometer caliper and recorded to the nearest 0.1 mm. Abbreviations are EYE (eye diameter), HW (head width), IB, (Institute of Ecology and Systematics, Havana, Cuba),

MNHNCU (Museo Nacional de Historia Natural, Havana, Cuba), SVL (snout-vent length), and USNM (National Museum of Natural History, Washington, DC). Comparisons of the new species with described species of *Tropidophis* were made by examination of museum material (see Specimens Examined; Appendix 1), published scale count data (Schwartz, 1957; Schwartz and Marsh, 1960; Schwartz and Garrido, 1975; Hedges and Garrido, 1992), and head shape measurements (Hedges and Garrido, 1992).

Tropidophis morenoi, sp. nov.
Figure 1

Holotype.—IB 2943, adult female, Dolinas de Cueva de Humboldt, Caguanes, Villa Clara Province, Cuba, 22°50'04"N, 80°12'02"W, 25 m, collected by José Salas in 1969.

Paratypes.—IB 2942, adult female, same data as holotype.

Diagnosis.—This species of *Tropidophis* is distinguished from all others by a combination of body shape, head shape, scalation, and color pattern (Table 1). With its high number of ventral scale rows (198–199), it is similar to some species in the *Tropidophis maculatus*, *Tropidophis melanurus*, and *Tropidophis semicinctus* groups (Schwartz and Marsh, 1960; Hedges and Garrido, 1992, 1999). *Tropidophis melanurus* and *Tropidophis caymanensis* are much larger species (SVL to 957 and 515 mm, respectively, vs. 285–295 SVL mm in *T. morenoi*) with higher body spot counts (47–64 vs. 38–39), and very different color patterns (Schwartz and Marsh, 1960; Thomas, 1963). From *Tropidophis celiae* (Hedges et al., 1999), *T. morenoi* differs in having fewer dorsal scale rows at midbody (23 vs. 27 in *T.*

² Corresponding Author.

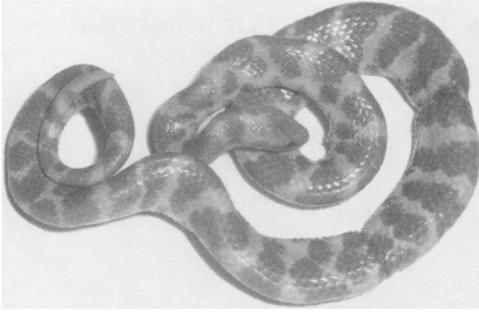


FIG. 1. *Tropidophis morenoi* (IB 2942), adult female, paratype.

celiae), no contact between parietal scales, and more dorsal body spots (38–39 vs. 60). *Tropidophis semicinctus* has more ventrals (201–223), larger eyes relative to head width (EYE/HW 0.30–0.34 vs. 0.24–0.27 in *T. morenoi*), fewer body spots (18–29 vs. 38–39 in *T. morenoi*), and fewer spot rows (two versus six in *T. morenoi*). *Tropidophis wrighti* has a gracile body shape (robust in *T. morenoi*), relatively larger EYE/HW 0.315–0.339 vs. 0.236–0.266 in *T. morenoi*, fewer body spots (21–37 versus 38–39 in *T. morenoi*), fewer spot rows (four vs. six in *T. morenoi*), rounded spots (fused spots in *T. morenoi*), a whitish ground color (buff in *T. morenoi*), and dark brown or black spots (medium brown in *T. morenoi*). From a new Cuban species being described elsewhere (SBH and OHG, unpubl. data), *T. morenoi* has 38–39 body bands in six rows (vs. 48–52 body spots in 10 rows in the new species), 23 middorsal scale rows (vs. 25), and has a boldly spotted venter (vs. unpatterned venter in new species).

Tropidophis spiritus requires closest comparison because it has a similar number of ventrals (200), middorsal scale rows (23), body spots (40), and spot rows (6). However, *T. spiritus* is a strikingly different looking snake with a differ-

ent head shape (blunt-snouted vs. more pointed in *T. morenoi*), body shape (gracile versus robust in *T. morenoi*), and coloration (grayish-tan ground with rounded black spots versus buff with vertically fused brownish spots in *T. morenoi*). The head shape differences also are reflected in shapes and arrangements of head scales. For example, in *T. spiritus* the postnasal scale does not contact the first upper labial (contacts in *T. morenoi*), the preocular is rectangular (tapers ventrally in *T. morenoi*), and upper labials 2–4 decrease in height posteriorly (do not decrease in *T. morenoi*).

Description of the Holotype (Paratype, If Different, in Parentheses).—An adult female; body robust, laterally compressed, head slightly expanded laterally (slightly distinct from neck), HW 7.2 (6.4) mm ÷ neck width 5.2 (4.2) mm = 1.39 (1.52); EYE 1.7 mm, eyes protruding only slightly beyond edge of head when viewed from above, EYE/HW = 0.24 (0.27); SVL = 295 (285) mm, tail length, entire = 42 (44) mm; ventrals, 198 (199); subcaudals, 42 (44); supralabials, 10/10 (left/right), scales 4–5 (4–6) in contact with eye; infralabials, 11/11; preoculars, 1/1; postoculars, 3/3 (3/2); dorsal scales, smooth, in 23–23–17 rows; middorsal row not enlarged, except for a few scales at posterior end of body and on tail; parietal scales separated by one scale.

In alcohol, dorsal and ventral ground color whitish beige (buff) contrasting with the medium brown dorsal and ventral spots; small brown flecks scattered sparsely over entire body, including head and chin; body spots in six longitudinal rows, including two on venter, although most dorsal spots fused vertically, appearing frequently as narrow bands that taper towards the venter, somewhat like the stripe of a zebra; if not fused, upper dorsal spots are approximately seven scales wide and three scales long; ventral spots rounded, 2–3 ventral scales in length and often in contact at midventer; 38/

TABLE 1. Comparison of characters of selected Cuban *Tropidophis*. Sample sizes are indicated in parentheses. Additional characters distinguishing *Tropidophis morenoi* and *Tropidophis spiritus* are described in the text.

Character	<i>T. morenoi</i> (2)	<i>T. spiritus</i> (1)	<i>T. wrighti</i> (18)	<i>T. semicinctus</i> (26)	<i>T. celiae</i> (1)
Maximum SVL (mm)	295	307	330	408	344
Ventral scales	198–199	200	192–222	201–223	203
Midbody scale rows	23	23	21–23	21–25	27
Body shape	Robust	Gracile	Gracile	Gracile	Robust
Ground color	Whitish beige	Grayish tan	White or tan	Yellow to orange	Pale tan
Dorsal pattern	Narrow bands	Spots	Spots	Spots	Spots
Ventral pattern	Spots	Spots	Spots	None	None
Spot rows	Six	Six	Four	Two	Two
Body spots	38–39	40	17–37	18–29	60
Tail spots	4–8	5	3–6	3–9	12
Head width/Neck width	1.39–1.52	1.35	1.77–2.24 (7)	1.70–1.88 (2)	1.31
Eye width/Head width	0.24–0.27	0.24	0.32–0.34 (7)	0.30–0.34 (2)	0.28

39 (38/38) body spots at dorsal midline; 4/5 (8/6) dorsal spots on tail; tail tip whitish-yellow and unpatterned; dorsal surface of head grayish-tan, without bold markings; a pair of indistinct brown blotches posterior to parietals; side of head with dark brown eye stripe, beginning on preocular scale, passing through eye, and extending to corner of mouth.

Etymology.—The new species is named after Luis V. Moreno, a skillful herpetologist and curator in the Department of Herpetology, Institute of Ecology and Systematics, Havana, Cuba.

Distribution.—*Tropidophis morenoi* is known only from the type-locality in north-central Cuba, located between the large lake Presa Alacranes and the coast (Bahía de Carahatas). It may inhabit other areas along the north-central coast, such as the Alturas del Noroeste and Llanura del Norte de Las Villas.

DISCUSSION

Within the context of the current species groups, *T. morenoi* could be placed in the *T. semicinctus* group based on its high number of ventrals and bold, spotted pattern. However, molecular analyses (Hass et al., 2001) suggest that the two large, banded snakes in the *T. semicinctus* group, *T. feicki* and *T. semicinctus*, both from western Cuba, are more closely related to *T. maculatus* (also from western Cuba) than to *T. wrighti* of eastern Cuba. The latter species is closely related to small, spotted species of eastern Cuba (e.g., *T. pilsbryi* and *T. fuscus*). Although superficially resembling *T. wrighti* and *T. spiritus*, the robust body, head shape, high ventral count, buff ground color, and bold spots suggest that *T. morenoi* is more closely related to the species from western Cuba (*T. maculatus* group). Also, the type-locality of *T. morenoi* in Villa Clara Province is an extension of the Western Coastal Plain (Llanura Occidental), and thus its distribution is consistent with this assignment.

Several factors suggest that the actual number of species of *Tropidophis* on Cuba is considerably higher than the present number of 13 species. Except for a few common species in the genus, these snakes are encountered infrequently and most fieldwork in recent years has focused on western Cuba (Pinar del Rio) and the eastern provinces ("Oriente"), with less attention paid to the central provinces. The new taxa recently discovered in the central provinces of Havana, Villa Clara, and Sancti Spiritus (Hedges et al., 1999; Hedges and Garrido, 1999), including taxa difficult to allocate to species group, indicate that our knowledge of the species diversity in this genus remains incomplete.

Acknowledgments.—We thank L. V. Moreno for bringing these specimens to our attention, the

Museum of Comparative Zoology and the National Museum of Natural History for the loan of comparative material, and R. W. Henderson for access to the *Tropidophis* data sheets of the late A. Schwartz. This research was supported by grants from the U.S. National Science Foundation (to SBH).

LITERATURE CITED

- HASS, C. A., L. R. MAXSON, AND S. B. HEDGES. 2001. Relationships and divergence times of West Indian amphibians and reptiles: insights from albumin immunology. In C. A. Woods (ed.), *Caribbean Biogeography*, pp. 157–174. CRC Press, Boca Raton, FL.
- HEDGES, S. B. 1996. The origin of West Indian amphibians and reptiles. In R. Powell and R. W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*, pp. 95–128. Society for the Study of Amphibians and Reptiles, Ithaca, NY.
- HEDGES, S. B., AND O. H. GARRIDO. 1992. A new species of *Tropidophis* from Cuba (Serpentes, Tropidophiidae). *Copeia* 1992:820–825.
- . 1999. A new snake of the genus *Tropidophis* (Tropidophiidae) from central Cuba. *J. Herpetol.* 33:436–441.
- HEDGES, S. B., A. R. ESTRADA, AND L. M. DIAZ. 1999. New snake (*Tropidophis*) from western Cuba. *Copeia* 1999:376–381.
- PETERS, J. A., AND B. OREJAS-MIRANDA. 1970. Catalogue of the Neotropical Squamata. Part I. Snakes. *Bull. U.S. Nat. Mus.* 297:1–347.
- POWELL, R., R. W. HENDERSON, K. ADLER, AND H. A. DUNDEE. 1996. An annotated checklist of West Indian amphibians and reptiles. In R. Powell and R. W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*, pp. 51–93. Society for the Study of Amphibians and Reptiles, Ithaca, NY.
- SCHWARTZ, A. 1957. A new species of boa (genus *Tropidophis*) from western Cuba. *Am. Mus. Novit.* 1839:1–8.
- SCHWARTZ, A., AND O. H. GARRIDO. 1975. A reconsideration of some Cuban *Tropidophis* (Serpentes, Boidae). *Proc. Biol. Soc. Wash.* 88:77–90.
- SCHWARTZ, A., AND R. J. MARSH. 1960. A review of the *pardalis-maculatus* complex of the boid genus *Tropidophis* of the West Indies. *Bull. Mus. Comp. Zool.* 123:49–84.
- THOMAS, R. 1963. Cayman Islands *Tropidophis* (Reptilia, Serpentes). *Breviora, Mus. Comp. Zool.* 195: 1–8.

Accepted: 14 February 2001.

APPENDIX 1

SPECIMENS EXAMINED

Tropidophis celiae: Cuba, MNHNCU 4474 (holotype). *Tropidophis maculatus*: Cuba, USNM 309775, MNHNCU 3422. *Tropidophis melanurus*: Cuba, MNHNCU 3423–26, 3428–30. *Tropidophis semicinctus*: Cuba, USNM 56347, USNM 139418. *Tropidophis spiritus*: Cuba, MNHNCU 4085 (holotype). *Tropidophis wrighti*: Cuba: MNHNCU 3434–37, USNM 138513.