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A New Amphisbaenian from Cuba

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ABSTRACT.—**A new species of *Amphisbaena* is described from the Cabo Cruz region of eastern Cuba. It shares with two other Cuban species, *Amphisbaena barbouri* (new rank) and *A. cubana*, fusion of the second supralabial and ocular scales. It is a pallid, long-tailed, xerophilic species associated with dry, coastal limestone habitats.**

In the West Indies, amphisbaenians occur only on the island banks of Cuba, Hispaniola, and Puerto Rico (Schwartz and Henderson, 1991). Three species are currently recognized from Cuba: *Amphisbaena blanoides*, *A. palirostrata*, and *A. cubana*. The first two occur in western Cuba and were placed in the genus *Cadea* until recently (Hedges, 1996; Powell et al., 1996). A fourth taxon, *barbouri*, was described as a subspecies of *A. cubana* (Gans and Alexander, 1962). It has a peculiar distribution in west-central Cuba in that it is known only from coastal or near-coastal localities in the north (Havana-Matanzas) and south (Bay of Pigs-Cienfuegos). Specimens from east and west (including Isla de Juventud) of these areas are assigned to the nominate subspecies (Schwartz and Henderson, 1991) and no morphologically intermediate specimens are known despite the close proximity of some localities and apparent sympatry at Soledad, Cienfuegos Province (Gans and Alexander, 1962). For these reasons (and, see below), we choose to recognize *A. barbouri* at the species level.

During July, 1994, we collected along the south coast of eastern Cuba ("Oriente") in the provinces of Granma and Santiago de Cuba. Although the entire coast between Cabo Cruz in the west and Cabo Maisí in the east is generally dry, the areas near the two capes are more xeric than the intermediate coast. In the western xeric area (Meseta de Cabo Cruz), between Cabo Cruz and Boca del Toro, a series of limestone terraces descends stepwise to the coast, and the xeric scrub vegetation grows within solution holes in the limestone. The conditions are very reminiscent of the xeric, scrub-covered, terraced limestone on the southern part of the Barahona Peninsula in Hispaniola. Within a kilometer to the west of Boca del Toro we collected four specimens of a distinctive, slender, pale species of *Amphisbaena*. A fifth specimen of this new species, also from the Cabo Cruz region, was found among specimens of *A. cubana* in the collection of the University of Michigan Museum of Zoology.

MATERIALS AND METHODS

Scale counts were taken according to the criteria of Gans and Alexander (1962); measurements of head scales were taken with a dissecting microscope and digital readout micrometer caliper. The count of total half-annular segments of the head is a count of the segments dorsal to the splitting of the second body annulus into two half-annuli, which may be given as a total count (the number of segments in anterior half-annulus + number of segments in posterior half-annulus). Snout–vent length (SVL) and tail measurements were taken to the nearest mm by laying the specimen along a ruler. Other length measurements were made with a digital readout micrometer caliper and recorded to the nearest 0.1 mm. Drawings of head scalation

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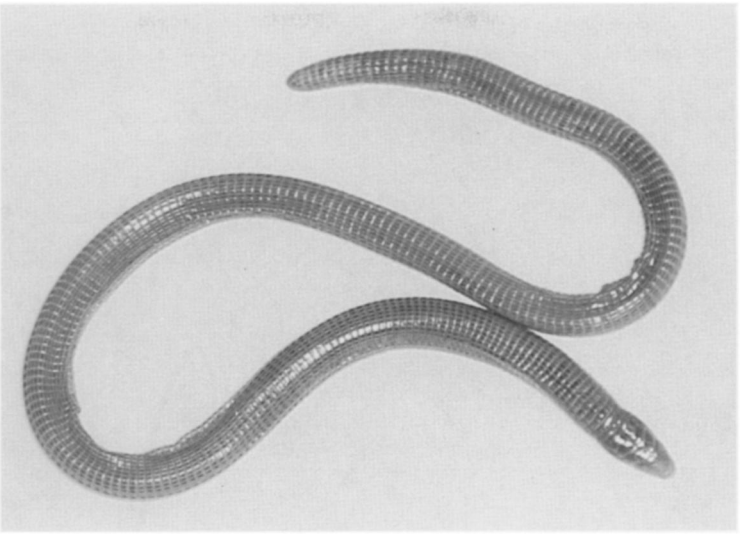

FIG. 1. *Amphisbaena carlgansi,* from the type-locality in Granma Province, Cuba.

were made with a camera lucida attachment to a Wild dissecting microscope. Museum abbreviations follow standardized usage (Leviton et al., 1985), except for MNHNCU, which refers to the collection of the Museo Nacional de Historia Natural (Havana, Cuba).

Amphisbaena carlgansi, sp. nov.
Figs. 1–2

Holotype.—MNHNCU 4421, a female, taken on the second limestone terrace above the sea, within 1 km west of Boca del Toro, Granma Province, Cuba, ca. 50 m. Collected on 8 July 1994 by Richard Thomas; fixed in 80–90% ethanol. Original field tag number 193876.

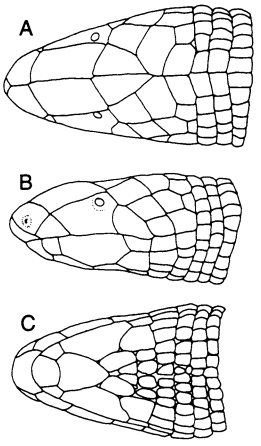

FIG. 2. Head scalation in *Amphisbaena carlgansi,* holotype (MNHNCU 4421). (A) dorsal, (B), lateral, and (C) ventral views.

Paratypes.—MNHNCU 4422, USNM 512213–214; same data as holotype; UMMZ 90720, "8 miles S Puerto Belig [=Bélic] N Cabo Cruz," Granma Prov., Cuba, collected in 1939 by Adrian Vanderhorst.

Diagnosis.—Three Cuban species, *Amphisbaena cubana, A. barbouri,* and *A. carlgansi,* share a major fusion of head scales (ocular + second supralabial) not found in other Antillean species of the genus (Gans and Alexander, 1962). Therefore it is appropriate to compare *A. carlgansi* with *A. cubana* and *A. barbouri.* Of the three species, *A. carlgansi* is most similar to *A. barbouri* and thus the diagnostic differences distinguishing *A. barbouri* from *A. cubana* also distinguish *A. carlgansi* from *A. cubana.* Most notably, *A. barbouri* and *A. carlgansi* are smaller and more slender species with higher numbers of body and caudal annuli and lower interfrontal/interprefrontal and internasal/interprefrontal ratios (Table 1).

The most relevant comparison of *A. carlgansi* is with its presumed closest relative *A. barbouri.* The two species can be separated by a combination of the following characters: tail length/SVL (0.080–0.086 in *carlgansi,* 0.060–0.079 in *barbouri*) (Fig. 3), coloration (pale pinkish-tan in *carlgansi,* medium brown in *barbouri*), number of body annuli (212–228 [$\bar{x}$ = 219] in *carlgansi,* 226–240 [$\bar{x}$ = 233] in *barbouri*), and total midbody segments (31–34 [mode = 32] in *carlgansi,* 28–32 [mode = 30, 31] in *barbouri*) (Table 1).

Description.—Size to 168 mm SVL (Total length 182 mm); body annuli 216–228 ($\bar{x}$ = 221); lateral annuli 2/2–3/3; caudal annuli 14–16, autonomy plane not evident; segments to a mid-

TABLE 1. Morphological variation in three species of Cuban *Amphisbaena*. Modes are given in parentheses for segments and cloacal counts; means are given for all other measurements and counts.

	A. cubana	*A. barbouri*	*A. carlgansi*
Snout-vent length	88–206 (162)	85–177 (152)	110–168 (145)
Body annuli	199–218 (208)	226–240 (233)	212–228 (219)
Caudal annuli	10–16 (11.6)	13–18 (15.2)	14–16 (14.4)
Total annuli	209–230 (219)	242–258 (247)	226–242 (233)
Dorsal midbody segments	12–16 (14)	12–14 (14)	14
Ventral midbody segments	14–18 (18)	16–18 (16)	18–20 (18)
Total segments	28–33 (32)	28–32 (30, 31)	31–34 (32)
Precloacals	5–10 (8)	4–8 (8)	7–8 (8)
Postcloacals	9–14 (11)	9–14 (11, 12)	11–13 (11, 12)
Total cloacals	16–22 (18.6)	16–21 (18.7)	18–21 (19.6)
Tail/SVL	0.060–0.090 (0.073)	0.060–0.079 (0.072)	0.080–0.086 (0.084)
Interfrontal/Interprefrontal	0.83–1.06 (0.89)	0.93–1.03 (1.05)	0.94–1.09 (0.98)
Internasal/Interprefrontal	0.14–0.31 (0.23)	0.22–0.51 (0.37)	0.28–0.34 (0.31)
Coloration	Medium-dark brown	Medium brown	Pale pinkish tan

body annulus 14/18–20; 7–8 precloacals; 11–13 postcloacals; 4 precloacal pores; total half-annular segments of head 4–8; chin segments 3 + 4; 4 + 4; or 3 + 5. Head narrow, not sharply distinct from neck; rostral triangular, apical in position, not fused with nasals, nor inserting between them other than as a broad apical wedge; nasals in broad sutural contact; prefrontals large, trapezoidal in broad sutural contact; frontals roughly trapezoidal, in broad sutural contact along bases; parietals asymmetrically trapezoidal with bases contacting third median segments of third body annulus; median segments of third body annulus somewhat enlarged, forming second parietals; extra half-annulus in head region resulting from split in dorsal part of second body annulus; total half-annular segments, including parietals 4 (2 + 2), 7 (3 + 4), or 8 (4 + 4 or 3 + 5); first supralabial small, subtriangular; second supralabial large, almost chevronate with upper portion consisting of fused ocular scale; weak indications of line of fusion present; third supralabial small, roughly pentagonal. Mental broadly arrow-shaped with curved first infralabial suture; first infralabial small, subquadrangular with wide base on labial border; second infralabial large, irregularly hexagonal with wide base along labial border, about ⅔ as wide as long; third infralabial small, trapezoidal; malar a right pentagon, about ⅔ as wide as long; postmental elongate, shield-shaped, subpentagonal with apex posterior, forming an 48–70 degree angle; two rows of postgenials, the first row of two enlarged teardrop-shaped scales and 1–2 much smaller triangular scales squeezed between them; second row of 4–5 roughly rectangular isometric scales. The dorsal coloration is a pale pinkish-tan that fades gradually to a slightly paler pinkish ventral coloration with no sharp demarcation.

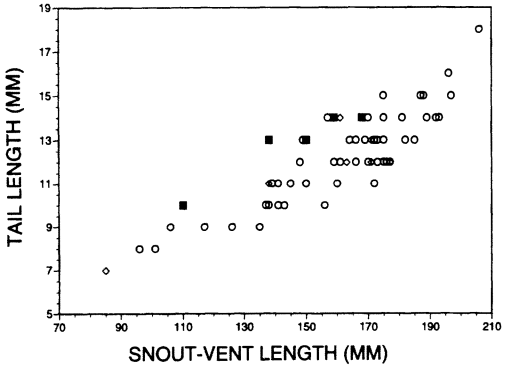

FIG. 3. Snout-vent length vs. tail length in three species of Cuban *Amphisbaena: A. cubana* (hollow circles), *A. barbouri* (hollow diamonds), and *A. carlgansi* (solid squares). Some data for *A. barbouri* and *A. cubana* are from Gans and Alexander (1962).

Distribution.—Known only from the two localities, separated by 27 km airline distance, on the Meseta de Cabo Cruz, Granma Province, Cuba.

Etymology.—We are pleased to name this species after Carl Gans for his renowned contributions to amphisbaenian biology.

DISCUSSION

In order to further compare *A. barbouri*, *A. carlgansi*, and *A. cubana*, we performed a discriminant analysis on six head measurements (snout to posterior edge of frontal, snout to posterior edge of first parietal, snout to posterior edge of second parietal, suture between nasals, suture between prefrontals, and suture between frontals) and counts of body and caudal annuli. There is no overlap between *A. cubana* and the other two species, and nearly complete separation between *A. barbouri* and *A. carlgansi* (Fig.

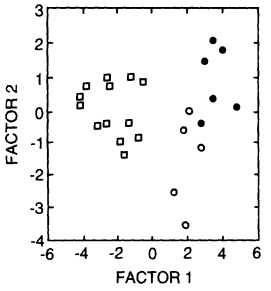

FIG. 4. Plot of the first two canonical variables from the discriminant analysis performed on the data for *Amphisbaena cubana* (open squares), *A. barbouri* (open circles), and *A. carlgansi* (closed circles).

4). This greater distinction of *A. cubana* agrees with the overall impression one gets from the shape and coloration of the three species: *A. barbouri* and *A. carlgansi* are thinner and less pigmented than typical members of the genus (such as *A. cubana*), suggesting that they might be sister species. Also, both tend to be coastal or near-coastal in distribution, whereas *A. cubana* also occurs in more mesic, interior, habitats.

That *A. cubana* represents a species distinct from the other two is clear, based on the non-overlapping morphological differences (see diagnosis), and on their close geographic proximity (or sympatry) without evidence of morphological intermediates. The type-locality of *A. carlgansi* is only about 5 km from a locality of *A. cubana* (Bosque de Castillo, Appendix 1), and *A. barbouri* is known from localities close to those of *A. cubana*. A single specimen of *A. barbouri* (MCZ 13524) is known from Soledad, Clenfuegos Province (Gans and Alexander, 1962), along with a series of *A. cubana*, indicating sympatry of those two species. However, that specimen differs from other specimens of *A. barbouri* (and *A. carlgansi* and *A. cubana*) in having narrower frontals, a broader and more rounded postmental, and enlarged, median postcloacals. It is likely that it represents yet another undescribed species of *Amphisbaena*, but we defer that action until additional material becomes available.

It is not uncommon for two distinct, sympatric species of *Amphisbaena* to be differentiated by only subtle morphological differences (Gans and Alexander, 1962; Thomas, 1965, 1966). In this case, two characters completely separate *A. barbouri* from *A. carlgansi:* their tail length ratios and body coloration (Table 1). In addition, the number of body annuli is almost completely non-overlapping. Besides these morphological differences, *A. carlgansi* appears to be a more xerophilic species than *A. barbouri* based on its distribution and habitat. Such differences are as great or greater than between sympatric species of *Amphisbaena* (e.g., Thomas, 1966) and therefore we believe that recognition of these taxa at the species level is justified.

The known ranges of *A. barbouri* and *A. carlgansi* are greatly separated (450 km airline distance). It is possible that they represent vicariant relicts of a more widespread coastal species that existed in the Pliocene or Pleistocene and have since differentiated.

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APPENDIX I

Specimens Examined

Amphisbaena barbouri.—Cuba: Cienfuegos Prov.; MCZ 13524, Soledad. Habana Prov.: USNM 512225–226, El Narigon, 0 m; MCZ 58788–89, Marianao; MCZ 12135, Ciudad de la Habana, Playa del Chivo. Matanzas Prov.: MCZ 12137, Caleta Rosario (Bahia de Cochinos).

Amphisbaena cubana.—Cuba; Granma Province: USNM 512236, Bosque del Castillo (1.1 km N Alegría del Pio), 200 m; Guantánamo Prov.: USNM 512228, Loma Redonda (5 km NW Hatibonico), 100 m; USNM 512229–230, 2.7 km W Costa Rica, 160 m; USNM 512231, 9.4 km ENE El Acueducto, 245 m; USNM 512227, Guantanamo Bay Naval Station; USNM 512232, El Molino, ca. 7 km W Palenque, 405 m; USNM 512233–234, 2.9 km W El Ramón, 200 m; Santiago de Cuba Prov.: USNM 512235, La Plata, 5 m.

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Specific Status of the Honduran Frogs Formerly Referred to *Plectrohyla teuchestes* (Anura: Hylidae)

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ABSTRACT.—**A new species of *Plectrohyla*, previously identified as *P. teuchestes*, is described from Parque Nacional El Cusuco in northwestern Honduras. Adults of the new species differ from those of *P. teuchestes* in snout shape, size, and several features of color in life. Several differences in tadpole morphology also exist between the two species.**

Plectrohyla teuchestes was described by Duellman and Campbell (1992; type locality: Finca Los Alpes, Departamento Alta Verapaz, Guatemala). These authors also assigned a series of frogs and tadpoles collected by us at El Cusuco, Departamento de Cortés, Honduras, to that species. Subsequently, we have collected additional adults and tadpoles of this frog from this locality on Cerro Cusuco. Mario Espinal also has made available to us additional adults that he recently collected in Parque Nacional El Cusuco. Comparison of the Honduran material to four paratypes and one lot of tadpoles of *P. teuchestes* from the type locality convinces us that the Honduran population represents an undescribed species. A description of this new species is provided below.

MATERIALS AND METHODS

All measurements were made to the nearest 0.1 mm with dial calipers under a dissecting microscope. Abbreviations used are SVL (snout–vent length), SHL (shank length), FL (foot length; distance from proximal edge of inner metatarsal tubercle to tip of longest toe), HL (head length; tip of snout to angle of jaw), HW (greatest width of head), EW (width of upper eyelid), IOD (interorbital distance; measured at midlength of upper eyelid), TPL (tympanum length), EL (eye length), and DW (third finger disc width). Two male (KU 64101-02) and two female (KU 64099, 64103) paratypes and one tadpole lot (KU 68522) of *Plectrohyla teuchestes* were examined for comparative purposes. Some data used in the Diagnosis concerning *P. teuchestes* were taken from Duellman and Campbell (1992), as were all such data for *P. acanthodes* and *P. pokomchi*. Color names and numbers for color in life descriptions refer to those in Smithe (1975). Tadpole stages refer to those of Gosner (1960).

SYSTEMATICS

Plectrohyla exquisita sp. nov.

Fig. 1

Holotype.—National Museum of Natural History (USNM) 513483, an adult male from El