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Notes on Amphisbaenids (Amphisbaenia, Reptilia). 8 A Redescription of *Amphisbaena stejnegeri* and the Description of a New Species of *Amphisbaena* from British Guiana

By Carl Gans[1]

INTRODUCTION

In 1922, Alexander G. Ruthven described a new species of *Amphisbaena* from a single specimen collected on a "sand reef at Vreeden Rust, Demerara River, British Guiana." He did not illustrate the new form, omitted body dimensions, and unfortunately mentioned neither the characteristic color pattern nor the fusion of mental and postmental, almost unique in the genus, in his diagnosis. The species is of considerable interest, since there have been few records of small species of *Amphisbaena* from continental South America north of the Amazon. Only the large species *A. fuliginosa* (cf. Vanzolini, 1951) and *A. alba* (cf. Gans, 1962b) had previously been taken in the Guianas. No additional specimens of *A. stejnegeri* have been reported since 1922, though there are four references to the species in the literature (Burt and Burt, 1933; Crawford, 1931; Parker, 1935; Peters, 1952).

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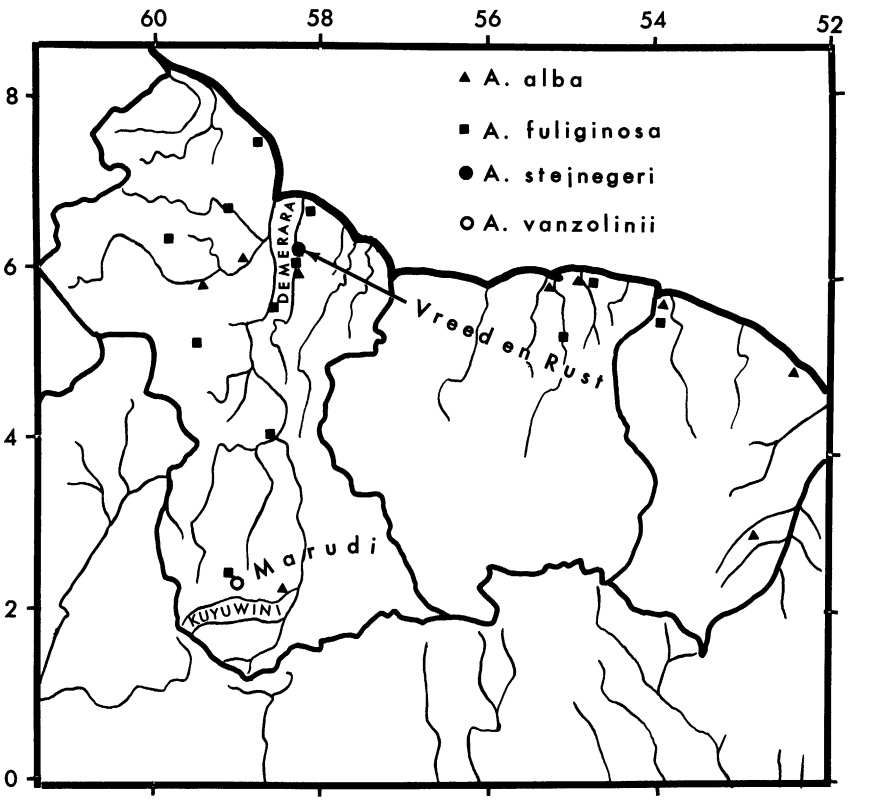

FIG. 1. Map of British Guiana, Surinam, and French Guiana (from left to right), showing the localities mentioned in the text. Localities from which *Amphisbaena alba* and *A. f. fuliginosa* have been recorded are also shown as solid symbols, without absolute exactitude of placement. River systems are shown only in enough detail to give the general arrangement of the watersheds.

Under the circumstances, I was somewhat surprised when examination of two unidentified American Museum specimens from British Guiana disclosed that they belonged to a second and yet unnamed species. I take pleasure in naming this form *Amphisbaena vanzolinii* after Dr. Paulo Emilio Vanzolini in recognition of his interesting studies on amphisbaenids, and for more personal reasons. The recent discovery, of what seems to be a second specimen of *A. stejnegeri*, permits me to add a standardized (cf. Gans and Alexander, 1962) and illustrated redescription of this form as well.

It is a pleasure to express my appreciation to Mr. Charles M. Bogert

and Dr. Richard G. Zweifel of the American Museum of Natural History (A.M.N.H.), Drs. F. W. Braestrup and H. Volsøe of the Universitetets Zoologiske Museum in Copenhagen (K.M.), and to Mr. T. M. Uzzell and Dr. C. F. Walker of the Museum of Zoology, University of Michigan (U.M.M.Z.), all of whom furnished information and lent material in their care. These studies are supported by Grants (NSF G–9054, G–21819) from the National Science Foundation.

KEY TO THE SPECIES OF *Amphisbaena* IN THE GUIANAS

1. Adults small and relatively slender; 39 or fewer segments to a midbody annulus 2
   Adults large and relatively stout bodied; 40 or more segments to a midbody annulus 3
2. Light base color, with dorsal darkening produced by more or less dense arrangement of heavily pigmented segments, their incidence reduced toward the head; mental and postmental fused; enlarged malars; six precloacal pores; 243 to 247 body annuli; 18 to 19 dorsal and 16 to 20 ventral segments to a midbody annulus; caudal autotomy occurring after the ninth caudal annulus (which is pigmented ventrally) ..... *A. stejnegeri* Ruthven
   Uniform brown dorsally, lighter ventrally; mental and postmental distinct; no enlarged malars; four precloacal pores; 225 to 228 body annuli; 12 to 13 dorsal and 16 to 17 ventral segments to a midbody annulus; caudal autotomy level varied ..... *A. vanzolinii*, new species
3. Prefrontals and oculars normally in contact with supralabials; tail relatively short and stubby, of constant diameter to a rounded tip; lacking a caudal autotomy constriction; no caudal autotomy; 13 to 21 caudal annuli; 65 to 85 (30–42 dorsal; 35–46 ventral) segments per midbody annulus; 198 to 248 body annuli; four to 10 precloacal pores; adults large; colored a uniform tan to brownish red; juveniles with a pattern of faint blotches .... *A. alba* Linné
   Prefrontals and oculars often separated from contact with the supralabials by a row of segments; tail relatively long, with a definite autotomy constriction, followed by a dilated portion; caudal autotomy present; 24 to 29 caudal annuli; 40 to 56 (20–28 dorsal; 20–28 ventral) segments per midbody annulus; 196 to 218 body annuli; six to 10 precloacal pores; adults medium to large; dorsal and in many cases ventral surface with black markings or irregular blotches, tending toward a checkered pattern; coloration crossing segmental borders, yielding half-pigmented segments .. *A. f. fuliginosa* Linné

Amphisbaena stejnegeri Ruthven

Amphisbaena stejnegeri RUTHVEN, 1922, p. 1. Terra typica: "Sand reef at Vreeden Rust, Demerara River, British Guiana."

HOLOTYPE: U.M.M.Z. No. 55858.

VARIATION: *Amphisbaena stejnegeri* was described from a single specimen, and no other material definitely assignable to this form has thus far come to hand. I was thus quite pleased when, through the courtesy of Drs.

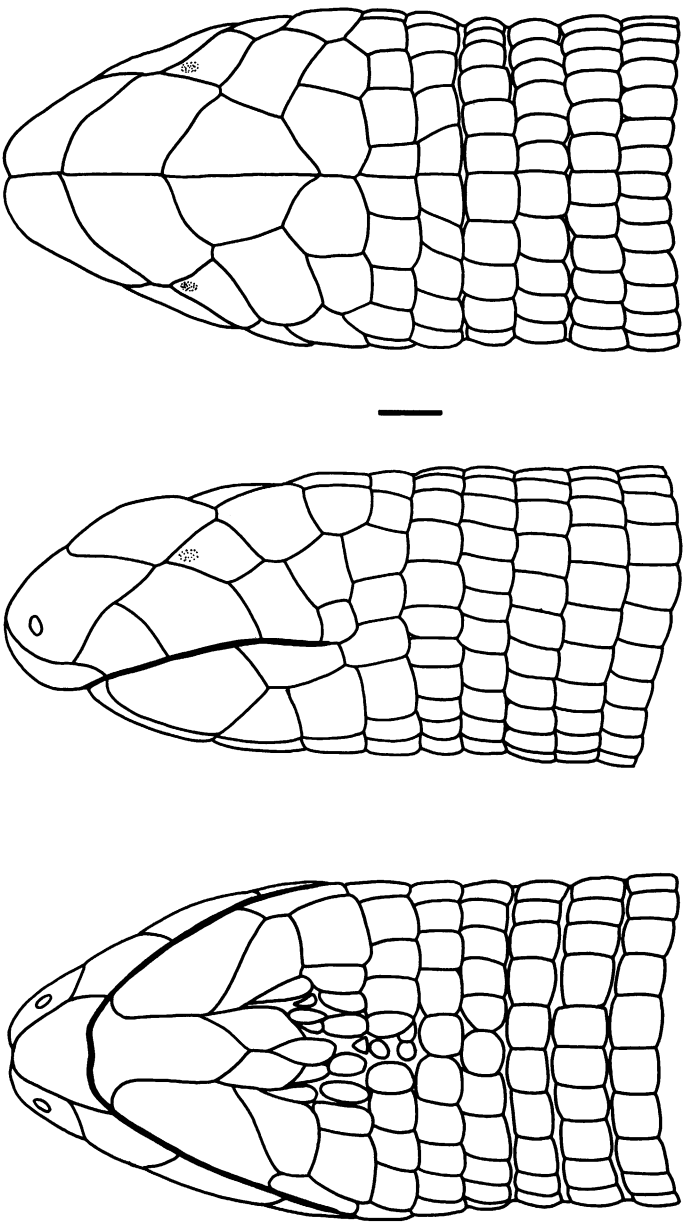

FIG. 2. *Amphisbaena stejnegeri*. Dorsal, lateral, and ventral views of the head of the holotype (U.M.M.Z. No. 55858) from Vreed en Rust, British Guiana. The line equals 1 mm. to scale. Drawn by V. Cummings.

Braestrup and Volsøe, I recently could examine another unique specimen, tagged with an unpublished manuscript name of C. H. Lütken, which has reposed in the Copenhagen collection since before 1839 (F. W. Braestrup, *in litt.*). The "no data" specimen is similar to the holotype but differs in several remarkable ways, which may or may not be significant. Among these are a split ocular, a much darker color pattern, and more segments per midbody annulus.

Since it has recently been possible to demonstrate two situations involving generally similar and geographically adjacent forms that differ

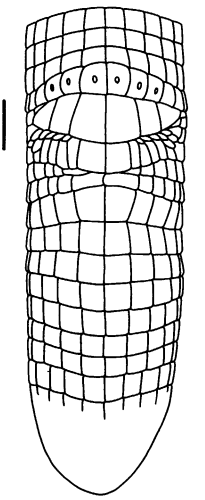

FIG. 3. *Amphisbaena stejnegeri.* Ventral view of cloaca and autotomized tail of the holotype (U.M.M.Z. No. 55858) from Vreed en Rust, British Guiana. The line equals 1 mm. to scale. Drawn by V. Cummings.

in only a few, sharply defined characteristics (Gans, 1961, 1962a), I have listed the differences demonstrated by the second specimen in brackets both in the diagnosis and in the description. The absence of bracketed material indicates that the description applies to both specimens.

DIAGNOSIS: A form of *Amphisbaena* with the mental and postmental fused; with the nasals the largest segments on the head [and the frontals scarcely distinguished; with the oculars split to form triangular infraoculars equal in size to the oculars]; and three supralabials and two infralabials. The form has 247 [243] body annuli; nine caudal annuli up to the autotomy constriction (at which the tail is autotomized); 17 to 18

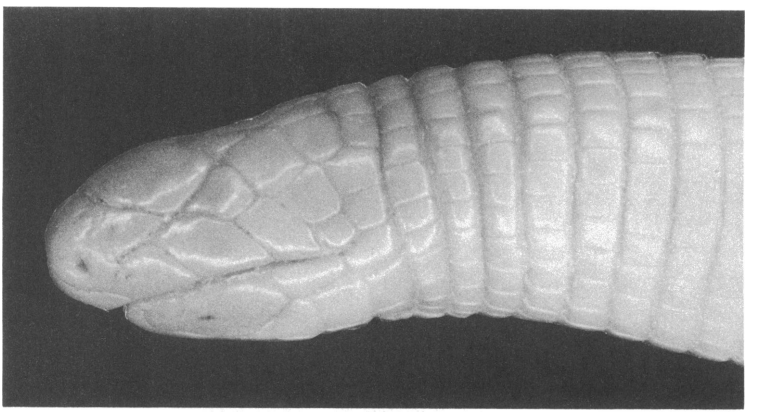

FIG. 4. *Amphisbaena stejnegeri.* Lateral view of head of the holotype (U.M.M.Z. No. 55858). Note the quadrangular ocular.

[19] dorsal and 16 [20] ventral segments to a midbody annulus; and six precloacal pores. The color of preserved specimens is yellowish, with an irregular dorsal scattering of individual dark segments [the frequency of dark segments is sufficiently high on the midbody dorsal surface to yield the impression of a scattering of light segments on a dark background], thinning out anteriorly toward an immaculate head. The anterior half

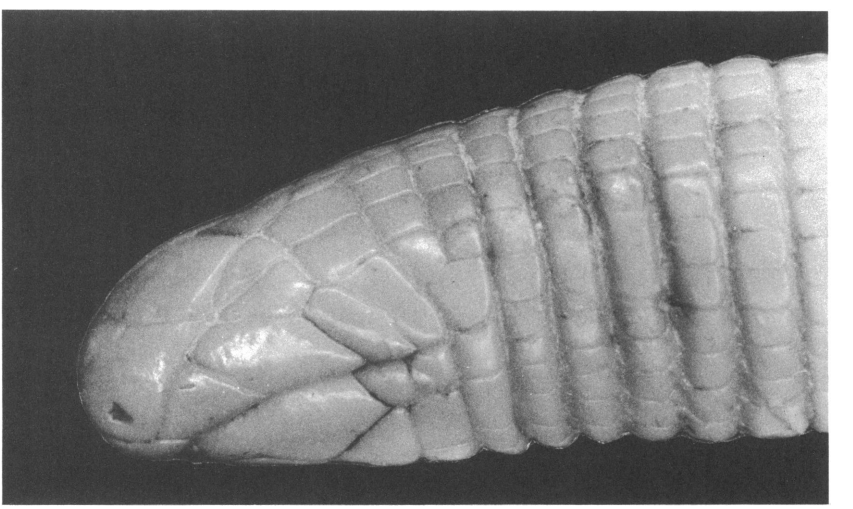

FIG. 5. *Amphisbaena stejnegeri.* Lateral view of the head of K.M. No. R–4442. Note the "split" ocular.

of some [most] infracaudal segments is strongly pigmented, while the infracaudal segments of the ninth postcloacal annulus are entirely pigmented.

DESCRIPTION: Figure 2 shows views of the head; figure 3, the ventral surface of the tail; and figures 4 through 9 are photographs of the coloration and other aspects of the two specimens. Meristic data are listed in table 1.

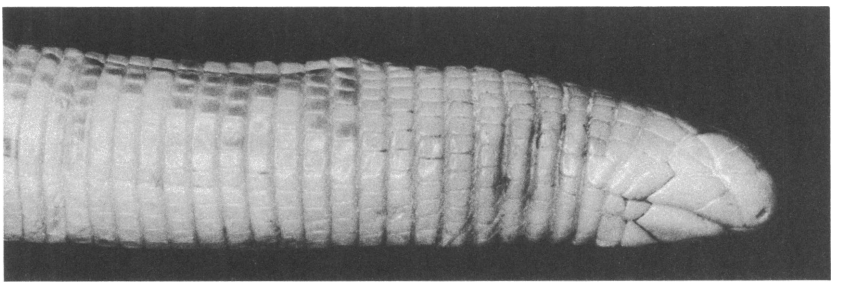

FIG. 6. *Amphisbaena stejnegeri.* Lateral view of anterior of body of K.M. No. R–4442. Note the appearance of dark segments on the anterior third of the body.

This is a small- to medium-sized species of *Amphisbaena*, of a yellowish color on which the pattern is expressed by the complete darkening of individual segments so that the pigmentation appears and drops out by segments. Dark brown segments are found on the dorsal surface and under the tail. Their relative density decreases from rear to front, and the head is immaculate, as in the type of *A. leucocephala* and in contrast to such species as *occidentalis*, *neglecta*, and *silvestrii*, in which the dorsal surfaces of head and tail are most densely pigmented. The holotype specimen shows a relatively light sprinkling of dark segments even in the caudal regions and the vicinity of the cloaca, which thins out to an arrangement of isolated dark segments, the anteriormost of which lies at the beginning of the animal's second quarter. [The coloration appears dark dorsally and lighter ventrally, with the dorsal color most clearly defined on the posterior third of the body, lightened somewhat on the middle third, and disappearing almost completely through the anterior third to sixth, again by dropping out of individual dark segments (cf. fig. 6).] The pigmentation is thus densest in the caudal region and least noticeable on the dorsal surface of the head, which is entirely pale. [A few clearly pigmented segments in the nuchal region testify to the fact that the light anterior color is not due to fading.]

The head segmentation is characterized by the fusion of (or lack of

TABLE 1

DATA FOR SPECIMENS OF *Amphisbaena stejnegeri* AND *Amphisbaena vanzolinii*

Species and Number	Body, Lateral, Caudal Annuli	Dorsal and Ventral Segments	Chin Segments	Cloaca	Total Length
A. stejnegeri					
U.M.M.Z. No. 55858	247+5+(9)x	17–18/16	2–5–(7)	6–7–16	206+(14)
K.M. No. R–4442	243+5+(9)x	19/20	2–5–(8)	6–10–13	265+(17)
A. vanzolinii					
A.M.N.H. No. 60778	225+4+(15)x	12/16	(3)–(8)	4–6–12	153+(14)
A.M.N.H. No. 60975	228+4/5+(7)x	13/17	(3)–(7)	4–6–12	129+(7)

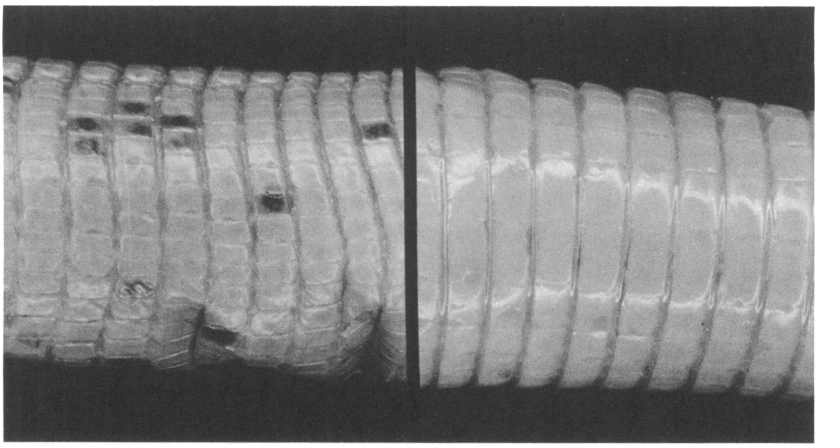

FIG. 7. *Amphisbaena stejnegeri.* Dorsal and ventral views at midbody of the holotype (U.M.M.Z. No. 55858). Note the difference in segment size and the restriction of dorsal pigmentation.

distinct separation between) mental and postmental. The head is of generally circular cross section, with a very strongly projecting rostral region, so that the rostral tip extends for a considerable distance beyond the anterior edge of the mental. The rostral, prefrontal, and frontal segments appear swollen which adds to the suggestion of a rounded cross section. There is little indication of dorsoventral flattening along the body. The muscle masses lying over the temporal region are not [but

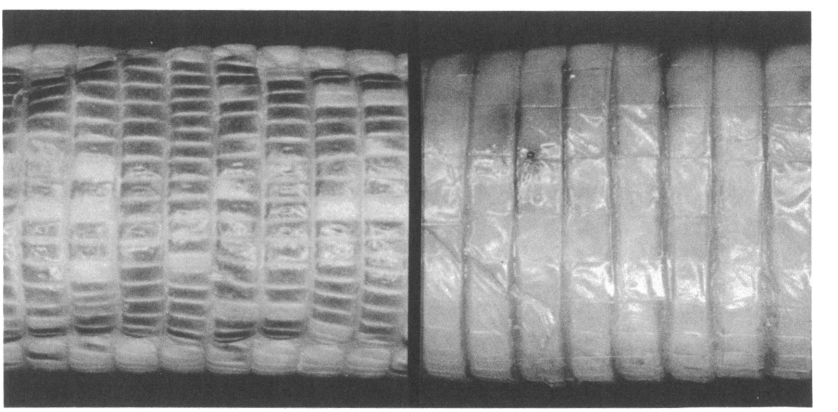

FIG. 8. *Amphisbaena stejnegeri.* Dorsal and ventral views at midbody of K.M. No. R–4442. Note the much greater frequency of dorsal pigmented segments.

faintly] apparent and do not [do] change the curvature of the head posterior to the eye.

The rostral is slightly larger than the first supralabial and is almost invisible from above. Pairs of enormous nasals, large prefrontals, and small frontals form a sequence along the head. The anterior edge of the parietals lies on the level of the angulus oris. The parietals are almost as large as the frontals. [The posterior edge of the frontals appears to have been divided off, giving two pairs of relatively small and asymmetrical

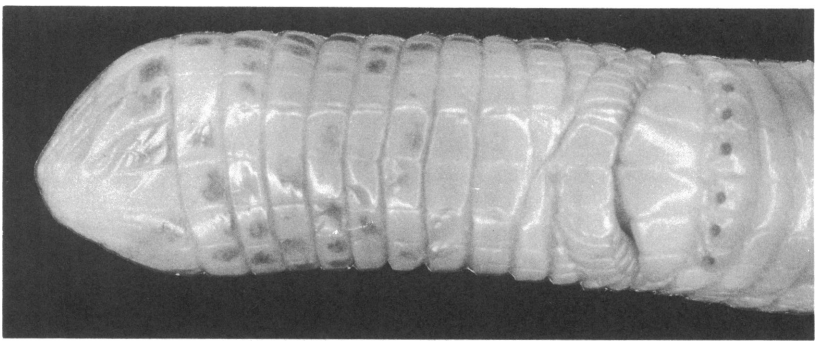

FIG. 9. *Amphisbaena stejnegeri.* Ventral view of cloaca and autotomized tail of the holotype (U.M.M.Z. No. 55858).

parietals. The posterior edge of the second pair lies at the level of the angulus oris.] There are three supralabials, with the angulus oris just at the beginning of the fourth segment in line (= post-supralabial). The second supralabial is much the largest, the third is twice as high as wide. All the inter-supralabial sutures run rostrad at an angle of 60 degrees or less to the edge of the mouth. The ocular is diamond-shaped, with its (longer) anterior edges in contact with the second supralabial and prefrontal. [Each ocular has been split into a large triangular infraocular, which is in point contact with the nasal, and a slightly smaller triangular ocular.]

The fused mental-postmental is flanked by two enormous first infralabials, followed immediately by an elongate second infralabial, the posterior half of which projects beyond the angulus oris. [This posterior half is split off as a distinct segment.] The spaces between the posterior edges of the wide first infralabial, the second infralabial, and the postgenials are taken up by two triangular malars. Two teardrop-shaped postgenials form the first row, and embrace the posterior edge of the fused mental-postmental. Three much smaller segments, flanked on each side

by a single sliver-shaped segment, divided off the medial edge of the malars, form the second postgenial row. The following row abuts on the medial surface of the posterior half of the second infralabial [or the first postinfralabial] by means of a pair of enlarged segments (=postmalars). This row is here considered to be part of the first body annulus, as it lies posterior to the angulus oris. If the ventral section were considered to be the postmalar row, its segmental count would be two plus six equal eight.

Dorsally the first body annulus includes two segments behind the third supralabial, and the postocular [split on the left side, as well as a pair of first parietal segments that appear to represent the divided-off posterior edge of the frontals]. It is followed by part of a dorsal half annulus, including the very large parietals, and then by the segments of the second body annulus. [This half annulus is more complete on this specimen, the parietals are smaller, and the segments are asymmetric on the left side of the specimen.] The second and succeeding annuli show little dorsal forward curvature.

There are 247 [243] body annuli from the back of the second infralabial up to and including the pore-bearing precloacals. The second through sixth annuli are shorter than the rest of the body annuli. There is no complexing of the pattern in the "pectoral" region. One extra dorsal half annulus is [Three extra dorsal half annuli are] interspersed among the 30 precloacal annuli. There are 17 to 18 [19] dorsal and 16 [20] ventral segments to a midbody annulus.

The cloacal region is characterized by six precloacal pores, seven [10] precloacal and 16 [13] postcloacal segments, and five lateral rows. There are nine caudal annuli up to and including the autotomy annulus, which has been very much enlarged in regeneration. The postcloacal segments bear pigment spots, and many infracloacal segments are pigmented on their anterior half. The autotomy annulus has most [all] of its ventral segments pigmented. The cap of skin regenerated across the autotomy break is segmented into very small irregular shields.

The lateral sulci are clearly marked after the nineteenth [thirteenth] body annulus and up to the level of the cloaca. Each of them is as wide as two bordering segments and filled with triangular segments. The dorsal sulcus is indicated as an alignment of intersegmental sutures for only the first quarter and not at all thereafter. It reappears on the dorsal surface of the tail. The ventral sulcus is noticeable only because of the alignment of unmodified intersegmental sutures.

The middorsal segments vary from slightly longer than wide to twice as long as wide; the midventral segments, from one and a half to twice as wide as [square to slightly wider than] long. There is only minor change

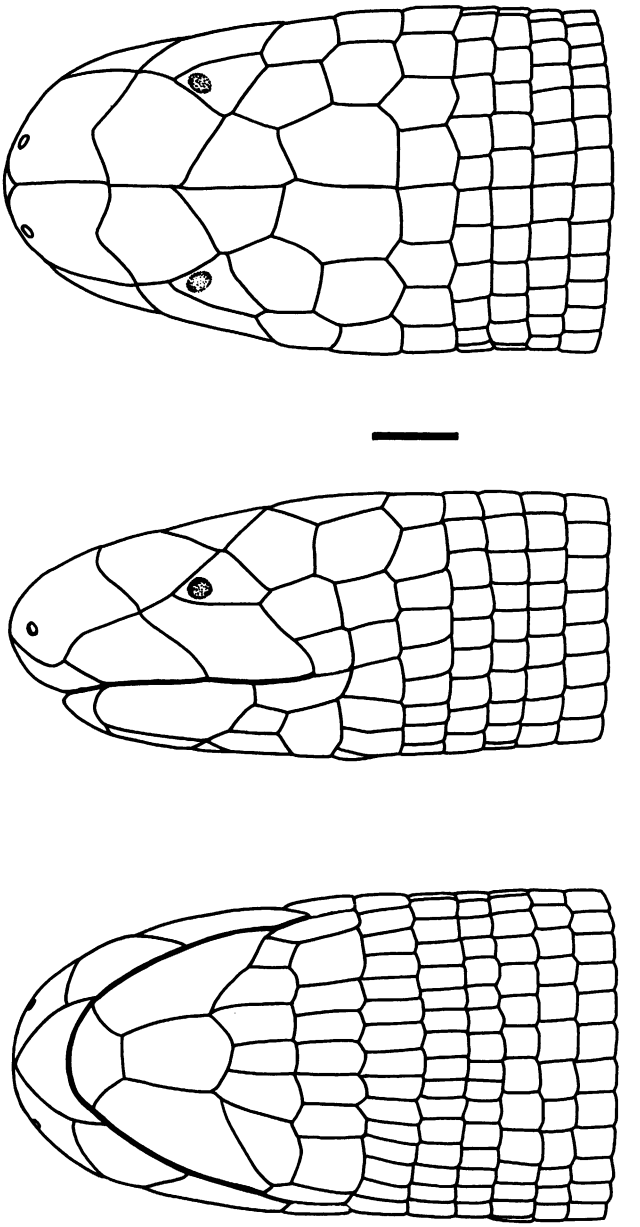

FIG. 10. *Amphisbaena vanzolinii*. Dorsal, lateral, and ventral views of the head of the holotype (A.M.N.H. No. 60975) from Marudi, British Guiana. The line equals 1 mm. to scale. Drawn by V. Cummings.

in segment proportions along the length of the body.

The specimen measures 206 [265] mm. from snout to cloaca, plus 14 [17] mm. from cloaca to the tip of the autotomized tail. The diameter at midbody is 7 [9] mm.

RANGE: British Guiana (known from the type locality only).

DISTRIBUTION RECORDS: No data: K.M. No. R–4442. *British Guiana:* Sand reef at Vreeden Rust, Demerara River (Ruthven, 1922); U.M.M.Z. No. 55858 (holotype).

Amphisbaena vanzolinii, new species

DIAGNOSIS: A form of *Amphisbaena* without major fusions of head shields; with the nasals the largest segments of the head and divided from the frontals by a peculiar V-shaped suture; without enlarged malars; with two supralabials and one and a half infralabials. The form has 225 to 228 body annuli; apparently more than 15 caudal annuli (the tail is broken in both types); no caudal autotomy constriction; 12 to 13 dorsal and 16 to 17 ventral segments to a midbody annulus; and four round precloacal pores. The color of preserved specimens is a uniform dark brown dorsally, fading to a lighter ventral coloring. The tendency toward darkening of the rectangular segmental centers is only faintly apparent under the microscope.

HOLOTYPE: Female specimen (A.M.N.H. No. 60975) collected at Marudi, British Guiana, in March, 1938, by Robert Snedigar. Charles M. Bogert informs me that W. Hassler, who went over the route of the expedition, placed the locality as "on a tributary of the Kuyuwini River, at 2° 5′ North and 59° East."

PARATYPE: Female specimen (A.M.N.H. No. 60778) collected at the same site as the holotype.

DESCRIPTION: Figure 10 shows views of the head; figure 11, the ventral surface of the cloacal slit; and figures 12 through 14 are photographs depicting coloration and other details. Meristic data are listed in table 1.

This is a small species of *Amphisbaena* of a uniform dark olive brown dorsal and a slightly lighter ventral coloration. The rectangular segmental centers are slightly darkened, but the ventral lightening is produced by a gradual fading or reduction of pigment density rather than by a "checkerboard" drop-out of pigmented segments. One of the poorly preserved specimens shows what may be remnants of a light collar across the nuchal region. The cloacal and caudal regions show no deviation from this pigment pattern.

The head segmentation is characterized by the absence of true (= enlarged) malars and by the presence of only two supralabials and one and a

half infralabials. The head is blunt and almost unpointed, dorsoventrally flattened, and of oval cross section. The rostral region projects but slightly over the mental. The entire body shows some dorsoventral flattening. The temporal muscles are but slightly swollen and do not significantly change the outline of the head.

The rostral is slightly smaller than the first supralabial and almost invisible in the dorsal view. Pairs of large nasals, equal-sized prefrontals, smaller frontals, much larger first and again smaller second parietals follow in sequence along the dorsal midline of the head. The anterior edge of the parietals lies on the level of the angulus oris. There are two supra-

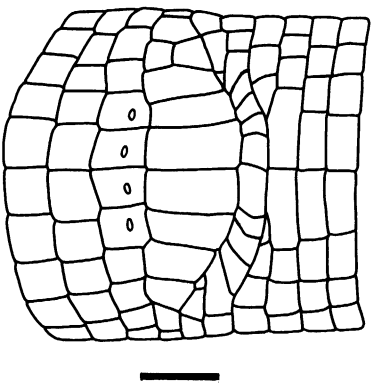

FIG. 11. *Amphisbaena vanzolinii.* Ventral view of the cloacal region of the holotype (A.M.N.H. No. 60975). The line equals 1 mm. to scale. Drawn by V. Cummings.

labials, with the second the larger, and the angulus oris is just at the beginning of the third segment in line (= post-supralabial). The intersupralabial sutures run rostrad at an angle of 45 degrees to the edge of the mouth. The ocular is a triangular sliver above the posterior two-thirds of the second supralabial. The oval (to pentagonal) postmental is flanked by two enormous first infralabials, each followed posteriorly by an elongate second infralabial, the posterior half of which projects beyond the angulus oris. The spaces between the posterior edges of the wide first infralabials and the medial edge of the narrow second infralabials are taken up by two rows, each having one or two (both types are asymmetric in this regard) short segments in place of the usual single enlarged malars. The three segments in the center of the first row may be counted as postgenials, but the second row does not correspond to postmalars, as it is in contact with the posterior half of the medial surface of the second infra-

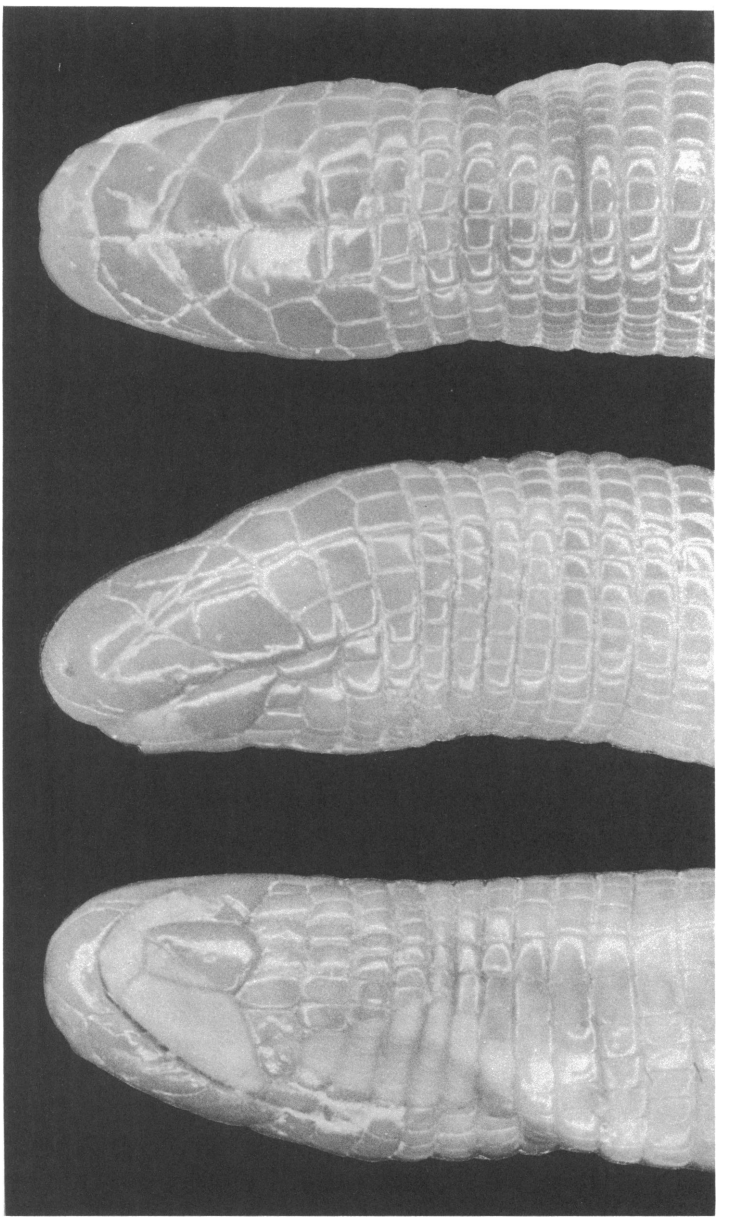

FIG. 12. *Amphisbaena vanzolinii.* Dorsal, lateral, and ventral views of the head of the holotype (A.M.N.H. No. 60975), showing general proportions and absence of striking coloration.

labial and thus lies beyond the angulus oris on the level of the first body annulus.

Dorsally the first body annulus includes two segments behind the second supralabial and a large supraocular touching the frontal. The dorsal halves of the next two body annuli expand in approaching the dorsal midline to culminate in the two pairs of large parietals, the first of which are much larger than the frontals. There are no intercalated dorsal half annuli.

There are 225 to 228 body annuli from the back of the second infralabial up to and including the pore-bearing precloacals. The second

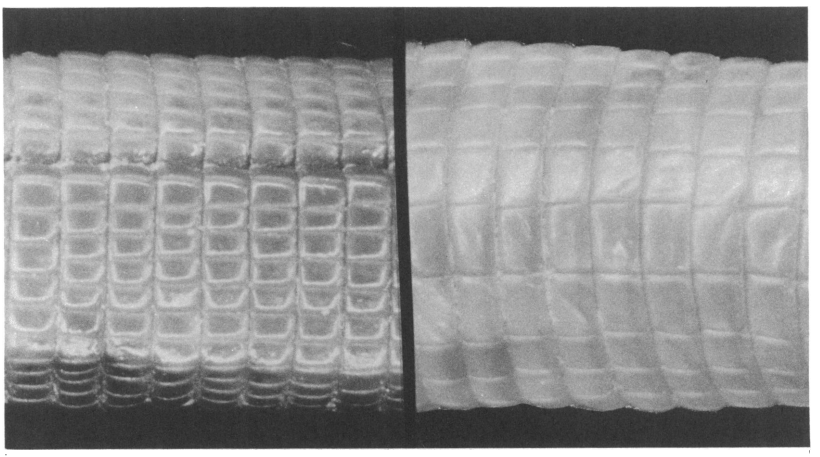

FIG. 13. *Amphisbaena vanzolinii.* Dorsal and ventral views at midbody of the holotype (A.M.N.H. No. 60975), showing relative segmental proportions.

through sixth annuli appear shorter laterally than the rest of the body annuli. There is no complexing of the pattern in the "pectoral" region. One specimen has an extra dorsal three-quarter annulus in the fifth precloacal position; the other shows no annular irregularities. There are 12 to 13 dorsal, 16 to 17 ventral, and 28 to 30 total segments to a midbody annulus.

The cloacal region is characterized by four precloacal pores, six precloacal and 12 postcloacal segments, as well as four (the holotype has five on the right side) lateral rows. Both specimens have autotomized tails. The tail of the holotype was broken and has healed after the seventh postcloacal annulus, the segments of which appear irregularly cut and enlarged in regeneration. The paratype shows a clean, but unhealed,

break after the fifteenth postcloacal annulus. There is no indication of an externally differentiated autotomy level on this specimen.

The lateral sulci are clearly marked from the beginning of the second third of the animal to the cloacal level. The dorsal and ventral sulci are apparent only as alignments of unmodified intersegmental sutures.

The middorsal segments vary from slightly longer than wide to twice as long as wide. The midventral segments are about one and a half times as wide as long. There is only minor change in segment proportion along the length of the body.

The holotype and paratype measure 129+7 mm. and 153+14 mm.,

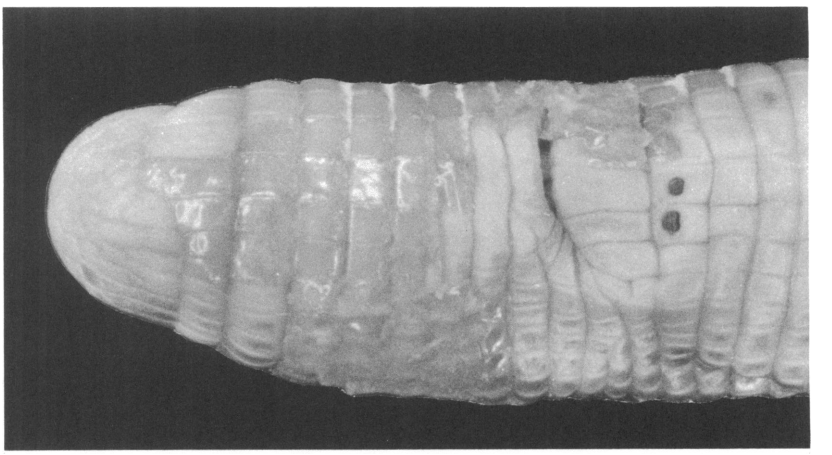

FIG. 14. *Amphisbaena vanzolinii.* Ventral view of cloaca and partially autotomized tail.

respectively, from snout to vent, and from vent to the tip of the autotomized tail. The diameter at midbody of the poorly preserved specimens is 3.8 and 4.5 mm., respectively.

RANGE: British Guiana (known from the type locality only).

DISTRIBUTION RECORDS: British Guiana: Marudi (Kuyuwini Tributary), A.M.N.H. No. 60975 (holotype) and No. 60778 (paratype).

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