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THE GENUS *LEPTOTYPHLOPS* IN THE WEST INDIES WITH DESCRIPTION OF A NEW SPECIES FROM HISPANIOLA (SERPENTES, LEPTOTYPHLOPIDAE)

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Three specimens of *Leptotyphlops* were collected in the summer of 1964 in the vicinity of the town of Pedernales, Dominican Republic, by Mr. David C. Leber and myself. These snakes appear most closely related to *L. bilineata* Schlegel which they resemble in the failure of the ocular to reach the labial border. No snakes of the genus *Leptotyphlops* have previously been definitely noted from the island of Hispaniola.

Boulenger (1893), however, recorded a specimen of *Leptotyphlos albifrons* Wagler from Santo Domingo de Guzmán collected by Dr. A. C. Buller. It so happens that the name of the capital city of the Dominican Republic, rarely referred to in its entirety, is Santo Domingo de Guzmán. The question of the provenance and relationships of the Buller specimen might therefore be important. Thanks to Miss A. G. C. Grandison, I have been able to examine this specimen (BM 90.10.10.73) and can confirm its affinities with the *albifrons* group of the genus. It appears to agree most closely with *L. phenops bakewelli* Oliver although the rostral-prefrontal fusion is apparently lacking. (Dunn and Saxe, 1950, regard *phenops* as a race of *albifrons;* but I here follow more recent authors such as Peters, 1954, and Duellman, 1961, in giving *phenops* specific rank.) Miss A. G. C. Grandison writes (*in litt.*) that "Dr. Audley C. Buller . . . made quite extensive collections in Mexico in 1891 and 1892, travelling from L. [Lago] Chapala and Guadalajara . . . to Bolaños and back to Ixtlán and later . . . to an area west of Guadalajara." Examination of a recent map of Mexico shows that roughly 200 km to the south of the city of Guadalajara in the state of Jalisco is a Ciudad Guzmán, which may well be another case of the unwieldy Santo Domingo de Guzmán having been shortened. Smith

and Taylor (1945) list *L. phenops bakewelli* from the states of Colima, Guerrero, Jalisco, Michoacán, and Oaxaca. That identity, collector, locality and time should all approximately coincide seems too remarkable for mere coincidence. This specimen (BM 90.10.10.73)[1] is here considered to be close to *L. p. bakewelli* from what is now Ciudad Guzmán, Jalisco, Mexico, and hence irrelevant to the Hispaniolan problem.

The specimens from Pedernales, however, are distinct from other species and apparently represent an endemic form, here named in allusion to the type locality[2] :

LEPTOTYPHLOPS PYRITES new species

Holotype: MCZ 77239, collected at the southern outskirts of the town of Pedernales, approx. 1 km from the center of town, Pedernales Province, Dominican Republic, 3 July 1964, by Richard Thomas.

Paratypes: USNM 152452, same locality as type, 26 June 1964, Richard Thomas; ASFS V2601, 9 km N Pedernales, Pedernales Province, Dominican Republic, 26 June 1964, David C. Leber.

Diagnosis: A species of *Leptotyphlops* of closest affinities to *bilineata* in that the second and third upper labial scales exclude the ocular from the labial border. It is further characterized by considerable attenuation, a high number of middorsal scales (from rostral to tail spine), 12 scale rows around the base of the tail, and 15 to 16 subcaudals, a trilineate dorsal pattern and unicolor, dark sides and venter.

Distribution: Known presently only from the northwestern lowlands of the Barahona peninsular region of Hispaniola.

Description of holotype (Fig. 1) : Head rounded, of same width as neck. Rostral at widest point slightly less than width of head at eyes, broadly truncate posteriorly at contact with prefrontal. Nasals separated by a transverse suture proceeding from first labial diagonally upward across naris to rostral; dorsal half of nasal also in contact with rostral, prefrontal, supraocular, ocular,

[1] BM 90.10.10.73 : Total length *ca.* 151 mm ; tail 7.6 mm ; middorsal scales about 246 ; subcaudals 16 ; scale rows 14 ; 10 scale rows around tail. Rostral extends posteriorly to slightly beyond level of eye, does not contact supraoculars. Suture completely divides nasals : supraoculars elongate, slanting sharply forward. One supralabial between oculolabial and nasal, one behind oculolabial. Light spot on rostral scale and on underside of tail from 13th scale anterior to caudal spine and including caudal spine. Dorsum dark, light scale edges form lines ; anterior venter light, becoming darker posteriorly.

[2] "Pedernales" means "flints," in Spanish, hence "pyrites," the Greek equivalent.

and first and second supralabials. Four supralabials, first smallest, second and third of about equal size, fourth largest; second and third supralabials in contact with ocular, occluding it from contact with labial border. Prefrontal, frontal and interparietal (third middorsal scale) increase in size in that order; middorsal

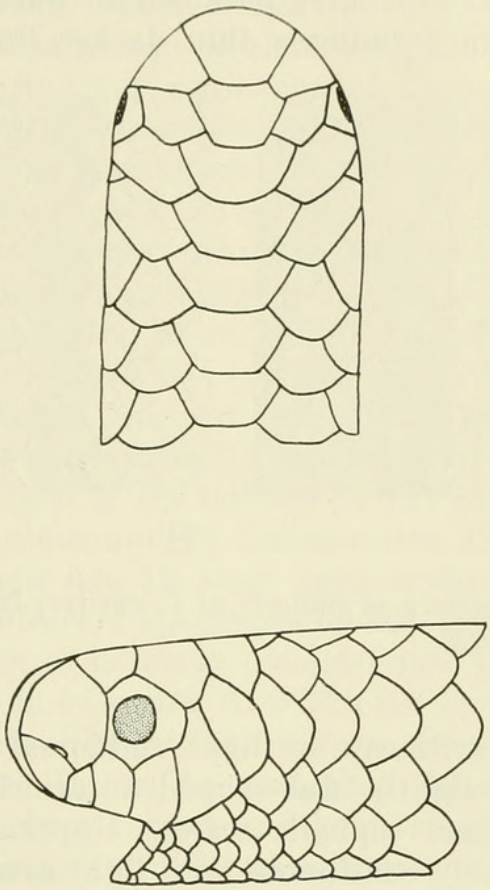

Fig. 1. Dorsal and lateral views of the head of the type specimen of *Leptotyphlops pyrites* (MCZ 77239).

scales posterior to the interparietal decrease gradually to standard body scale size. Parietal and fourth upper labial in broad contact behind ocular. Parietal and postparietal distinctly enlarged, parietal the larger. Supraocular about equal in size to prefrontal. Middorsal scales 273 from rostral to caudal spine; 14 scales around body; 12 around base of tail; subcaudals 15. Anal scale enlarged and shield shaped, tri-lobate posteriorly. Body very slender, of nearly uniform diameter throughout; total length 133 mm; diameter at midbody (2.0 mm) into total length about 67 times; length of tail into total length 24 times.

Coloration (Fig. 2): Ground color of body chestnut; middorsal scales from prefrontal back, chestnut with faint lighter (tannish brown) lateral corners. First paramedian dorsal rows (including supranasals, supraoculars, parietals and postparietals) plus dorsal third of second paramedian rows tannish brown. Central axis of first paramedian dorsal rows suffused with darker brown forming a thin darker line on these rows,

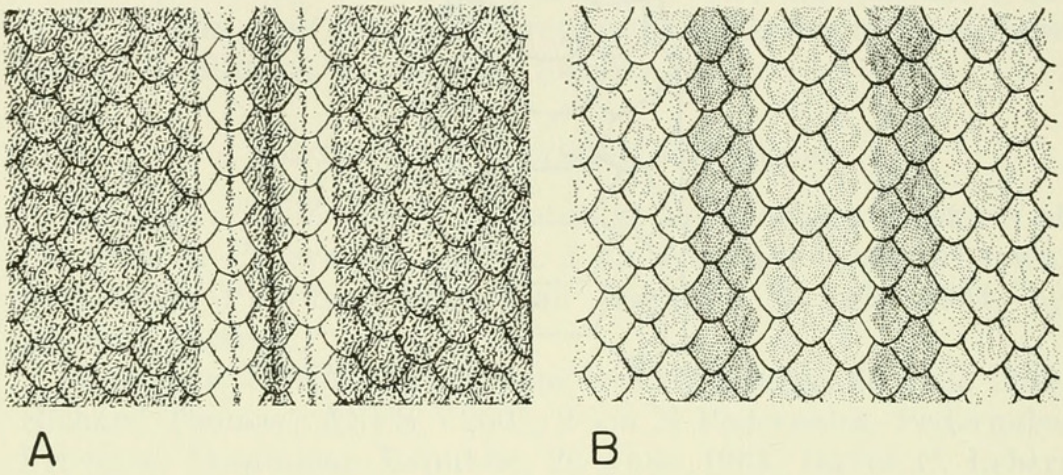

Fig. 2. A, color pattern at midbody of *L. pyrites*; B, color pattern at midbody of *L. bilineata*.

resulting pattern trilineate on light middorsal zone (Fig. 2A); middorsal stripe slightly club-shaped anteriorly because of enlargement of median cephalic scales. Upper and lower labial margins light, nearly continuous with light areas on top of head flanking median dark stripe; paramedian dark lines commence on first scale behind second parietal; rostral faintly suffused with brown.

Variation: Head scalation in the two paratypes is much the same as that of the type. Total length of each paratype 123 mm; diameters at midbody (1.9 and 2.0 mm) go into total length 65 and 61 times; tail lengths into total lengths go 21 times for each specimen. Middorsal scales 269 and 283; 15 and 16 subcaudals; 14 scale rows and 12 scales around the base of tail in both paratypes. Color patterns the same as that of the type.

Comparisons and discussion: As noted previously, *L. pyrites* is most closely related to *bilineata*, described by Schlegel from Martinique; *bilineata* is additionally recorded from Guadeloupe (Duméril and Bibron, *fide* Barbour, 1914), Barbados (Boulenger, 1893), and St. Lucia. (See also below, specimens examined.)

Underwood (1962) indicated that *bilineata* occurs on the mainland of South America, but he has informed me (*in litt.*) that this was a mistake. There appear to be no other records of *bilineata* from the mainland. The Guadeloupe record has not been substantiated in recent years. Dr. Guibé of the Muséum National d'Histoire Naturelle, Paris, writes (*in litt.*) that there are no specimens from Guadeloupe in that institution, and that he has not been able to find any indication of specimens from Guadeloupe. All of the specimens collected by Guyon and Plée have the locality indicated as Martinique. It seems best, therefore, to regard the Guadeloupe record as erroneous. [3]

Of the eight specimens of *bilineata* examined from Martinique, St. Lucia and Barbados, middorsal scales range from 170 to 189, in the neighborhood of one hundred scales lower than the counts for *pyrites* (269-283); scale rows are 14 in all cases, although two specimens reduce to 12 and 13 just anterior to the vent. Subcaudals range from 12 to 14 (15-16 in *pyrites*); scale rows around the base of the tail are 10 (11 in one) in all specimens from Martinique and St. Lucia versus 12 for *pyrites*. The Barbados specimen has 12 scale rows around the tail. Total lengths for the *bilineata* specimens 60-108 mm, for *pyrites* 123-133 mm. The ratio of midbody diameter into total length ranges from 34.6 to 43.2 in *bilineata*, 61.0-66.5 for *pyrites*. The ratio of tail length into total length varies from 15 to 18 for *bilineata*, 21-22 for *pyrites*. It can be seen that the two species differ abundantly in body scalation and proportions. In head scalation there are no constant differences between the two. In coloration, once again, the differences are striking (Fig. 2B). The unicolor middorsal zone, dorsolateral light lines, dark sides and light venter of *bilineata* contrast strongly with the more complex dorsal pattern and uniformly dark sides and venter of *pyrites*. *L. bilineata* also has a rather large patch of light (cream or yellow) scales surrounding the cloacal opening, while *pyrites* does not (the lips of the cloaca are light, but the scales surrounding it are not). In addition to having 12 scales around the tail, the Barbados specimen also has the highest middorsal scale count (189). Klauber (1940) has found the number of scales around the tail to be a useful differential character; it is possible that the

[3] Mr. James D. Lazell, Jr. states (pers. comm.) that the natives of Guadeloupe spoke of two kinds of "two-headed" snakes (i.e. *Typhlops* or *Leptotyphlops*), of which one was said to have a lineate pattern and to inhabit the hotter, dryer parts of the island — a rather accurate and concise characterization of *L. bilineata*.

Barbados snakes are distinct from those of Martinique and St. Lucia.

Leptotyphlops albifrons Wagler has been recorded from Antigua, Grenada (Boulenger, 1893), and from Swan Island (Dunn and Saxe, 1950) in the West Indies; it also occurs on the South American mainland. This species (and its relatives in the *albifrons* group) is quickly distinguished from *pyrites* and *bilineata* by the extension of the ocular scale to the labial border; it is also characterized by a finely lineate dorsal and ventral pattern, and a light spot on the rostral and one on the tip of the tail. The name "*albifrons*" is used here with some reservations. I have examined a number of *Leptotyphlops* from South America pertaining to this group, but unfortunately none from the type locality of *albifrons* (Pará, Brazil). There is obviously more than one species involved in the material I have seen, but I have not tried to determine which of the profusion of available names applies to which forms except where West Indian specimens are concerned.

Examination of the specimen of *albifrons* recorded by Boulenger from Antigua shows it to agree closely, both in coloration and supraocular-first labial contact, with specimens from Trinidad to which the name *L. tenella* [4] has been given (Klauber, 1939). No further specimens of *Leptotyphlops* from Antigua have come to light, not even under the more intensive herpetological collecting of the region in recent years. The locality for the specimen is possibly incorrect; it is probably best to regard the Antiguan record for *Leptotyphlops* as problematical until specimens are obtained or the negative evidence becomes stronger. Mr. Wayne King has informed me (pers. comm.) that the record of *Leptotyphlops* from the nearby island of Barbuda (Auffenberg, 1958) is in error and was due to an incorrectly identified *Typhlops*.

The record of *L. albifrons* from Grenada (Boulenger, 1893) is based on two specimens in the British Museum. Miss Grandison has advised me that the correct datum for these specimens is New Granada. As New Granada is the old name for the South

[4] Subsequent to its proposal, the name *tenella* has been regarded variously as applying to a distinct species with specimens reported from as far south as the Brazilian state of Mato Grosso (Bailey and Carvalho, 1946) or as a race of *albifrons* inhabiting northeastern South America (Rozé, 1952). It is my feeling that *tenella* represents either a subspecies of a wide-ranging South American form (presumably true *albifrons*) or a variant (supraoculars and first labials in contact) which occurs throughout much of the range of *albifrons* (as far south as Mato Grosso) but is of particularly high frequency in the northeast. However, my knowledge of the complex of forms in the *albifrons* group is too meager to venture a solution to the problem at this time.

American country of Colombia, these specimens can no longer be regarded as pertaining to the Lesser Antillean island of Grenada.

The New Granada specimens are indeed of the *albifrons* group but do not pertain to that species. They have uniformly dark colored tails (with the exception of the terminal light spot) and relatively high middorsal scale counts (245, 253); they possibly pertain to a form or complex of forms including *margaritae* Rozé (1952, described as a subspecies of *albifrons*) from Isla Margarita, off of Venezuela, and *melanoterma* Cope (1862) described from Corrientes, Argentina.

L. albifrons magnamaculata Taylor is known from Swan Island in the West Indies and additionally from San Andrés, Providencia, and the Bay Islands of Honduras, including Utila (type locality). It is supposedly distinguished by a larger white spot on the snout and a more extensive spot under the tail (Taylor, 1940), and more vivid markings (Dunn and Saxe, 1950).

Leptotyphlops columbi Klauber is known only from Watlings Island in the Bahamas, over 400 miles from its nearest congener. The Bahamas are as a whole poorly collected, and it may well be found to occur on other islands. *L. columbi* too can be distinguished from *pyrites* in the possession of an oculo-labial contact; it is further distinguished by a high subcaudal count (22-25: Legler, 1959), and a nearly uniform dark dorsal coloration but paler venter (*op. cit.*). Klauber used the coloration and the high subcaudal count to distinguish it from forms of the *albifrons* group (however, Legler's new data indicate an overlap with the highest "*albifrons*" counts of 23 noted by Klauber, 1939, and myself).

Key to the West Indian *Leptotyphlops*

1. Ocular excluded from labial border 2
   Ocular extends to labial border 3
2. Middorsal scales (between rostral and terminal spine) 170-189, venter light ..... *bilineata*
   Middorsal scales 269-283, venter dark ..... *pyrites*, n. sp.
3. Light spot on snout and tip of tail 4
   No light spot on snout and tip of tail, coloration generally dark above, lighter below ..... *columbi*
4. Supraoculars contact first supralabials ..... *tenella*
   Supraoculars not in contact with first supralabials ..... *albifrons magnamaculata*

The strange apparent distribution of *Leptotyphlops* in the West Indies should be noted (Fig. 3). There has been a tendency to dismiss the erratic insular occurrence of these small snakes as due in large part to introduction by man, both pre- and post-Columbian. While it must be admitted that their small size and burrowing habits make them likely candidates for artificial transportation, we have no evidence that this has occurred. Such thinking is an easy way out of facing what might well be a real but complex zoogeographic problem. To begin with, the distribution of *Leptotyphlops* in the Lesser Antilles is perhaps no more unusual than the non-uniform distribution of several other forms in this region (cf. *Leptodactylus, Ameiva, Gymnophthalmus, Bothrops, Constrictor*). The non-uniform distribution of other forms is attributable in part to the erratic nature of natural dispersal across water and in part perhaps to selective extinction on some islands; in the case of creatures like *Leptotyphlops* some of the gaps may be more apparent than real due to incomplete collecting.

Not all cases are, in any event, erratic. *L. a. magnamaculata* occurs on marginal islands (Swan Island) that are close to the mainland; it is closely allied to the mainland *albifrons* representative (Dunn and Saxe, 1950); its distribution, therefore, is not particularly remarkable or unexpected. Although the specimen of Antiguan *tenella* is regarded as being of questionable provenance, the occurrence of a form of strong South American affinities so far up the chain would not be unprecedented if this record is verified. Thus, the gecko *Phyllodactylus* occurs on Puerto Rico and the adjacent Caja de Muertos; the nearest records to the south for this genus are Grenada and Barbados. *Leptotyphlops pyrites* and *L. columbi* are the Antillean forms found farthest from the mainland and whose distributions are the most irregular. The fact that *L. pyrites* has an obvious relative in the Lesser Antilles and apparently none on the mainland strongly bespeaks a relict distribution in the West Indies. The exact relationships of *L. columbi* are uncertain; although Klauber suggested a closer affinity with *albifrons* than with other forms, it is apparently not close. *L. columbi* may either represent a fortuitous arrival in the Bahamas or a relict distribution. Its apparent distinctness would seem to speak against its having been artificially introduced, as has been suggested (Darlington, 1957:221).

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acquisition of the form described. I also wish to thank the following people for their help in various ways: Père R. Pinchon of the Séminaire College (SC), Fort-de-France, Martinique, for the loan of specimens and for the donation of a specimen to the ASFS (Albert Schwartz Field Series) collection; Miss A. G. C. Grandison of the British Museum (Natural History) (BM) for the loan of specimens and the biographical information on Dr. A. C. Buller; Dr. James A. Peters of the U. S. National Museum (USNM) for the loan of specimens and help in finding *Leptotyphlops* names and literature; Dr. Ernest E. Williams of the Museum of Comparative Zoology, Harvard (MCZ) for loan of specimens and help in obtaining literature; Neil D. Richmond of the Carnegie Museum (CM) for the loan of specimens; and Mr. David C. Leber for his most able assistance in the field. RT designates specimens in the Richard Thomas private collection.

Specimens Examined

Leptotyphlops pyrites: As listed for the type and paratypes.

Leptotyphlops bilineata: Martinique: BM 53.2.4.36, USNM 119168; Fort-de-France, SC 1; Tartane, Morne Jésus, SC 2-3, ASFS V4150. St. Lucia: MCZ 10693. Barbados: BM 89.7.5.27.

Leptotyphlops "albifrons" (no nomenclatural finality intended): Specimens in the American Museum of Natural History and the University of Michigan Museum of Zoology collections, Brazil (1), Bolivia (7), Perú (16).

Leptotyphlops tenella: Trinidad: St. George Co.: Mt. St. Benedict, CM 4888-89, 4892, 6612 (paratypes); El Dorado, CM 4893 (paratype); Arima Ward, Santa Cruz Valley, 7.5 mi. N San Juan, RT 1186. ?Antigua: BM 50.4.29.3.

Leptotyphlops cf. *margaritae:* New Granada: BM 80.2.26.4-5.

Leptotyphlops phenops cf. *bakewelli:* Santo Domingo de Guzmán, BM 90.10.10.73.

LITERATURE CITED

Auffenberg, Walter

1958. A small fossil herpetofauna from Barbuda, Leeward Islands, with the description of a new species of *Hyla*. Quart. Jour. Florida Acad. Sci., vol. **21**, no. 3, pp. 248-254.

Bailey, Joseph R., and A. L. de Carvalho

1946. A new *Leptotyphlops* from Mato Grosso, with notes on *Leptotyphlops tenella* Klauber. Bol. Mus. Nac., Zool., no. 52, pp. 1-7, 4 figs.

Barbour, Thomas

1914. A contribution to the zoogeography of the West Indies, with especial reference to amphibians and reptiles. Mem. Mus. Comp. Zool., vol. **44**, no. 2, pp. 209-346.

Boulenger, George Albert

1893. Catalogue of snakes in the British Museum (Natural History). London, vol. 1, xiii + 448 pp.

Cope, E. D.

1862. Catalogues of the reptiles obtained during the explorations of the Parana, Paraguay, Vermejo, and Uraguay rivers, by Capt. Thos. J. Page, U.S.N. and of those procured by Lieut. N. Michler, U. S. Trop. Eng., Commander of the expedition conducting the survey of the Atrato River. Proc. Acad. Nat. Sci. Philadelphia, pp. 346-359.

Darlington, Philip J., Jr.

1957. Zoogeography: the geographical distribution of animals. New York. John Wiley & Sons, Inc., pp. i-xi, 1-675, 80 figs.

Duellman, William E.

1961. The amphibians and reptiles of Michoacán, México. Univ. Kansas Publ. Mus. Nat. Hist., vol. **10**, pp. 1-148, 6 pls., 11 figs.

Dunn, E. R. and L. H. Saxe, Jr.

1950. Results of the Catherwood-Chaplin West Indies Expedition, 1948. Part V. Amphibians and reptiles of San Andrés and Providencia. Proc. Acad. Nat. Sci. Philadelphia, vol. **102**, pp. 141-165.

Klauber, Laurence M.

1939. Three new worm snakes of the genus *Leptotyphlops*. Trans. San Diego Soc. Nat. Hist., vol. **9**, no. 14, pp. 59-66, 6 figs.

1940. The worm snakes of the genus *Leptotyphlops* in the United States and northern Mexico. Trans. San Diego Soc. Nat. Hist., vol. **9**, no. 18, pp. 87-162, 8 figs., 6 pls., 2 maps.

Legler, John M.

1959. Notes on the snake *Leptotyphlops columbi* Klauber. Herpetologica, vol. **15**, p. 112.

Peters, James A.

1954. The amphibians and reptiles of the coast and coastal sierra of Michoacán, México. Occ. Pap. Mus. Zool. Univ. Michigan, no. 554, pp. 1-37.

Rozé, Janis A.

1952. Contribución al conocimiento de los ofidios de las familias Typhlopidae y Leptotyphlopidae en Venezuela. Mem. Soc. Cien. Nat. La Salle, vol. **12**, no. 32, pp. 143-158.

Smith, Hobart M. and Edward H. Taylor

1945. An annotated checklist and key to the snakes of Mexico. Bull. U. S. Natl. Mus., vol. **187**, iv + 239 pp.

TAYLOR, EDWARD H.
1940. Herpetological miscellany no. I. Univ. Kansas Sci. Bull., vol. **26**, no. 15, pp. 489-571, 5 pls., 7 figs.
UNDERWOOD, GARTH
1962. Caribbean affairs No. 1. Reptiles of the eastern Caribbean. Dept. Extra-Mural Studies, Univ. West Indies., pp. 1-191.

(Received 16 February, 1965.)

pyrites	Total length	Tail length	Mid-dorsals	Sub-caudals	Rows, tail	Midbody diameter
USNM 152452	123	6	283	15	12	1.9
ASFS V2601	123	6	269	16	12	2.0
MCZ 77239	133	6	273	15	12	2.0
bilineata						
MCZ 10693	74	4	182	13	10	1.7
BM 53.2.4.36	108	7	183	14	11	2.5
SC 1	107	6	174	12	10	3.1
SC 2	93	5	181	14	10	2.4
SC 3	60	4	187	14	10	1.6
ASFS V4150	108	6	175	13	10	2.9
USNM 119168	102	7	170	13	10	
BM 89.7.5.27	102	6	189	13	12	

Table 1. Data for individual specimens of *L. pyrites* and *L. bilineata* examined. Measurements are in millimeters.

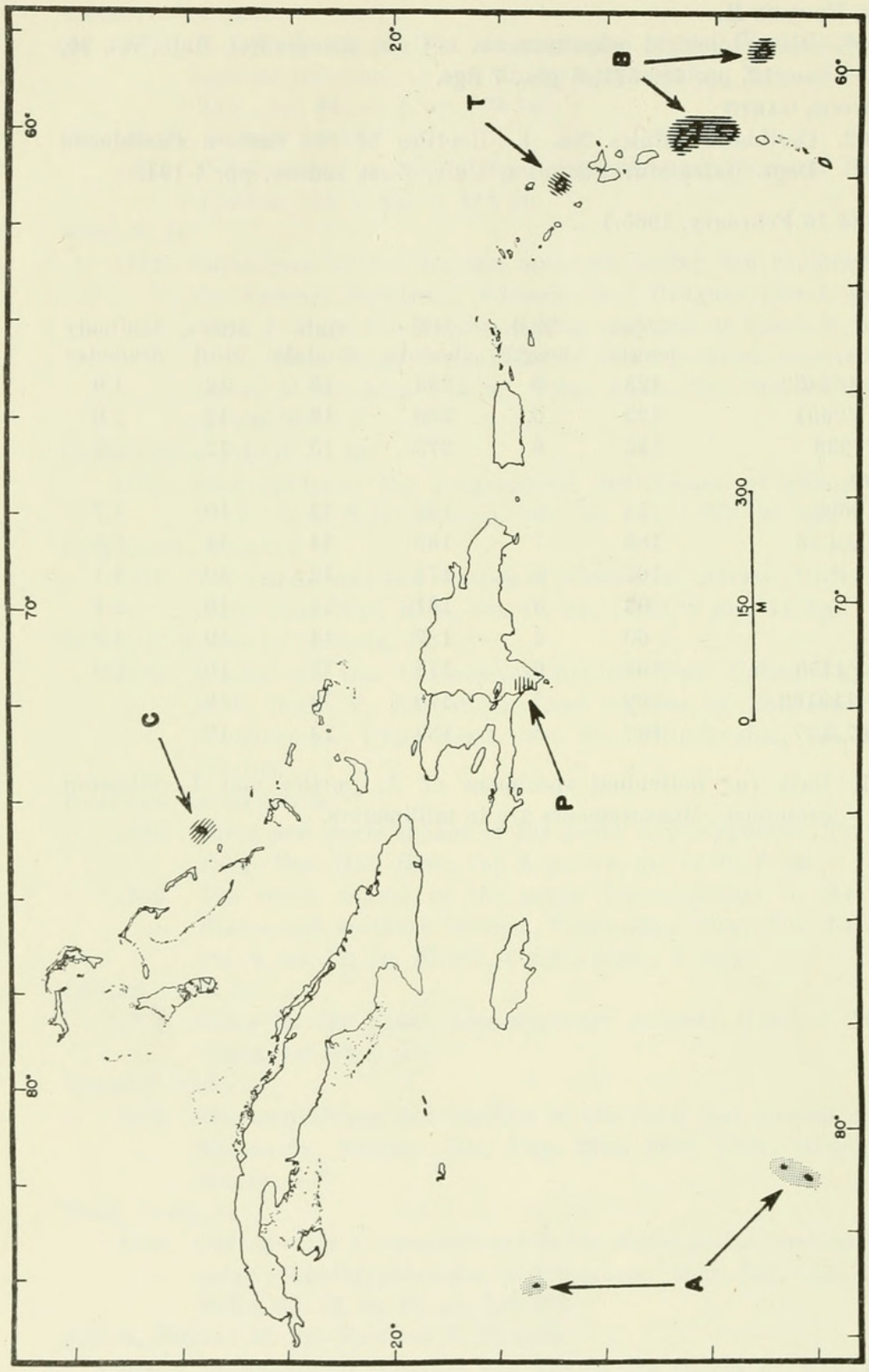

Fig. 3. Map of the West Indies showing the distribution of *Leptotyphlops*. A, *albifrons* (Swan I., San Andrés, Providencia); C, *columbi* (Watlings); P, *pyrites* (Hispaniola); T, *tenella* (Antigua); B, *bilineata* (Martinique, St. Lucia, Barbados).