HISTORICAL PERSPECTIVE

The Herpetology of Hispaniola[1]

Doris M. Cochran

INTRODUCTION

This study of the herpetology of Hispaniola has been undertaken for the purpose of advancing the survey of the amphibian and reptile fauna of the Greater Antilles. Of these islands Hispaniola has remained the least known faunistically until the past two decades, during which time thorough collecting in certain regions has multiplied the number of species known to science. Although undoubtedly a great many more species, and perhaps even some genera, remain to be discovered in areas in which little collecting has so far been done,[2] it is hoped that the following keys, descriptions, and figures of the species already known from Hispaniola may prove to be a stimulus to further discoveries.

Hispaniola, with the adjoining islets, now divided between the Republic of Haiti and the Dominican Republic, has been referred to by earlier writers as San Domingo, St. Dominique, Santo Domingo, Hayti, and Haiti. When such names are used without any specific river or town or other geographic feature that might serve to locate them definitely, it is often impossible to say whether it was the intention of the author to refer to the entire island or to either one of its political subdivisions, properly spoken of as the Republic of Haiti and the Dominican Republic. The old name of Hispaniola is now taken to refer to the island as a whole and the adjoining islets Gonave, Tortue, Sept Frères, Saona, Alta Vela, Beata, Île à Vache, and the Cayemites. In the locality lists the abbreviation "D. R." refers to the Dominican Republic, and "Haiti" to the Republic of Haiti alone. Equivocal records are given in quotation marks. While the island of Navassa[3] is not included in this survey, figures of the types of the two Navassan reptiles, *Typhlops sulcatus* and *Celestus badius*, will be found in the discussion of their apparent allies in Hispaniola.

For the loan of specimens my thanks are due to Dr. Thomas Barbour[4], of the Museum of Comparative Zoology; to Mrs. Helen T. Gaige, of the Museum of Zoology at Ann Arbor; and to K. P. Schmidt, of the Field Museum. I am indebted to Dr. G. K. Noble, of the American Museum of Natural History, for the loan of several paratypes, and to Dr. E. R. Dunn for specimens in the Academy of Natural Sciences of Philadelphia. I have borrowed some Leiocephali from the British Museum, which Boulenger had listed, and H. W. Parker kindly furnished me with lists of other specimens in that museum, while I was later allowed to examine these specimens and those in several other European collections during a visit in 1938. My sincere thanks are due to Dr. Leonhard Stejneger, of the United States National Museum, whose unfailing interest, encouragement, and assistance in the many problems involved have made the completion of the work possible.

Most of the figures for this Herpetology of Hispaniola were made by me from photographs. In a few instances, where the specimens were mutilated or otherwise unsuited to photography, the drawings are freehand. When figures have been copied from earlier publications, credit is given in the legends.

PHYSIOGRAPHY

An excellent summary of the geographical features of Hispaniola appeared in "The Birds of Haiti and the Dominican Republic," by Dr. Alexander Wetmore and Bradshaw H. Swales [U. S. Natl. Mus. Bull. 155, pp. 2–7, 1931]. There is little to add to their discussion, except to remark that the extremely rugged character of the island's surface has proved to be a very effective means of isolation to certain genera of amphibians and reptiles, so that a truly astonishing number of entirely localized forms is often found within a relatively restricted area.

The Massif de la Selle Mountains, whose tops were islands when the Cul-de-Sac Plain was below sea level, supplies a good example of this condition, for within the past few years two new genera of lizards and a new genus of snakes have been found on Peak La Selle.

Another interesting evidence of specialization carried out to subspecies is found in the genus *Leiocephalus*. No less than 11 distinct subspecies of the *personatus* group are now known from Hispaniola as a whole — seven from the mainland and one each from four of the adjoining islets.

The snakes of the genus *Leimadophis* [= *Antillophis*] have the tendency to local specialization to nearly the same degree, as

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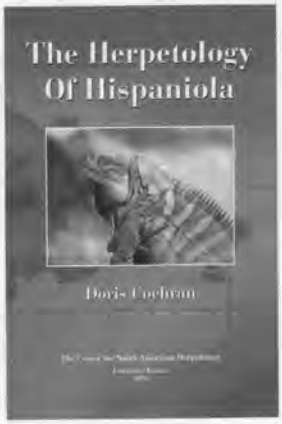
[1] Excerpted from the *United States National Museum Bulletin* (177): vii + 398 pp. (1941). This long out-of-print book will soon be available as The Center for North American Herpetology Facsimile Reprint Series, Number 1 (check www.cnah.org for availability).



[2] For a more recent list of Hispaniolan species of amphibians and reptiles, see: Powell et al. 1999. The Hispaniolan herpetofauna: Diversity, endemism, and historical perspectives, with comments on Navassa Island, pp. 93–168. In: B.I. Crother (ed.), *Caribbean Amphibians and Reptiles*. Academic Press, San Diego, California.

[3] For more information about Navassan reptiles, see: Powell. 1999. Herpetology of Navassa Island, West Indies. *Caribbean Journal of Science* 35: 1–13 (www.caribjsci.org) or www.avila.edu/biology/Bobweb/6pownav.htm.

[4] See *Iguana* 12:43–47.

seven subspecies of the *parvifrons* stock can be recognized, three rather poorly separated forms from the present main body of the island and four rather distinct forms from outlying islets. An example of the effect of the removal of a natural barrier is evident here. Almost within the memory of the oldest inhabitant, Samaná Peninsula was an island separated from the main body of Hispaniola by a rapidly filling strait, in which pirate vessels were said to have lain in wait for richly laden merchantmen sailing for Europe. On this island a black form of *Leimadophis* developed. The melanistic color is found in a good many of the *protenus* specimens from the northeastern part of the Dominican Republic, and, as a matter of fact, it is at present very difficult to find a satisfactory basis for the separation of *niger* and *protenus* as subspecies, since so many intergrading specimens now exist in the lowlands lying between the areas once separated by stretches of sea.

DISTRIBUTION OF GREATER ANTILLEAN GENERA

In table 1 are listed the genera occurring on the neighboring islands of the Greater Antilles. Hispaniola has 19 genera in common with Cuba. Cuba has 10 genera that Hispaniola lacks, but, on the other hand, Hispaniola has 13 genera not found in Cuba.

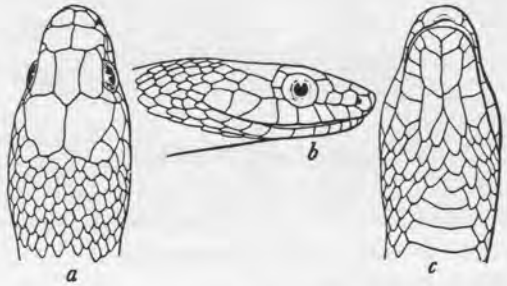
Hispaniola and Jamaica have 19 genera in common. Jamaica has no genus that is not also found in Hispaniola, while Hispaniola has 13 that do not occur in Jamaica — a condition perhaps to be expected as Hispaniola is so much the larger of the two islands.

The tiny isolated rock called Navassa supports 10 genera, all of which are represented in Hispaniola, including the highly specialized iguanid genus *Chamaelinorops* [now included in *Anolis*, and no longer believed to occur on Navassa], which is not known from any other localities except Navassa and western Haiti.

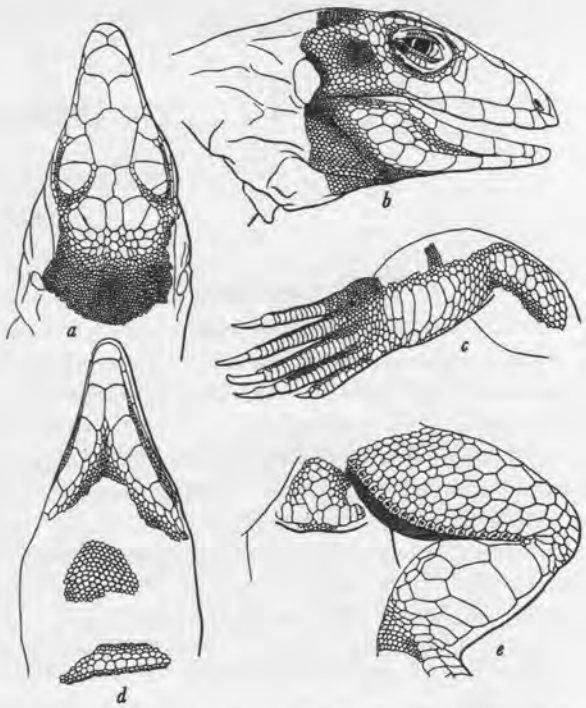
Surveying the islands east of Hispaniola, we find that Puerto Rico has only one (nonendemic!) genus — *Phyllodactylus* — which is not represented on Hispaniola [*Phyllodactylus* is now known to occur on Hispaniola], while Mona does not have a single genus peculiar to itself. Puerto Rico lacks 15 of the genera that characterize Hispaniola, while the two islands have 16 genera in common.

DISTRIBUTION OF HISPANIOLAN SPECIES

Table 2 lists the species found in Hispaniola and indicates their distribution among the various regions.



Leimadophis [= *Antillophis*] *parvifrons parvifrons* (USNM No. 60607, from Moline, Haiti).



Ameiva chrysolaema chrysolaema (USNM No. 66730, from Tubano, Azua Province, Dominican Republic). See also article on p. 234.

THE NONINDIGENOUS SPECIES

Out of 128 species and subspecies now known to inhabit Hispaniola, only 6 or 7 are not indigenous. Of the 32 known genera, 7 are found nowhere else.

Among the nonendemic forms now recorded from Hispaniola, *Bufo marinus*, which was very recently introduced, seems to be gaining a real foothold in Monte Cristi. *Hemidactylus brookii*, originally introduced from Africa with the traffic in slaves[5], has now become established in tropical America.

The same is true of *Hemidactylus mabouia*. Another gecko, *Sphaerodactylus cinereus*, is one of the commonest species in Cuba, whence it was probably transported to southern Florida, Navassa, and Haiti[6]. The slipperyback, *Mabuya mabouia sloanii*, represented very rarely in Hispaniola, is considered by Dr. Dunn (1936, p. 546) to be the same as the form occurring in the southern Bahamas, Jamaica, the Virgin Islands, Mona, and Puerto Rico[7]. *Typhlops lumbricalis* is a species of which more Hispaniolan material is needed before an ultimate decision as to

[5] See discussions in: Powell and Maxey. 1990. *Hemidactylus brookii. Catalogue of American Amphibians and Reptiles* (493):1–3, and Powell, R., R.I. Crombie, and H.E.A. Boos. 1998. *Hemidactylus mabouia. Catalogue of American Amphibians and Reptiles* (674): 1–11.

[6] Cuban and Navassan populations once considered to be *Sphaerodactylus cinereus* are no longer considered to be conspecific with the Haitian populations.

[7] The status of West Indian populations of *Mabuya* is poorly understood and in much need of work by researchers using genetic data. Currently, as many as four species are thought to occur in the region, but at least two of these may represent species complexes of uncertain complexity.

Table 1.—Distribution of Greater Antillean genera of amphibians and reptiles[1].

Genus	Cuba	Jamaica	Navassa	Hispaniola	Mona	Puerto Rico
Bufo	X	(X)	—	X	—	X
Hyla	X	X	—	X	—	
Eleutherodactylus	X	X	—	X	—	X
Leptodactylus	—	—	—	X	—	X
Sminthillus	X	—	—	—	—	—
Gonatodes	X	—	—	X	—	—
Phyllodactylus	—	—	—	—	—	(X)
Hemidactylus	(X)	(X)	—	(X)	—	(X)
Aristelliger	—	X	X	X	—	—
Tarentola	X	—	—	—	—	—
Sphaerodactylus	X	X	X	X	X	X
Chamaeleolis	X	—	—	—	—	—
Xiphocercus	—	X	—	X	—	—
Chamaelinorops	—	—	X	X	—	—
Audantia	—	—	—	[X]	—	—
Deiroptyx	X	—	—	—	—	—
Anolis	X	X	X	X	X	X
Norops	[X]	—	—	—	—	—
Cyclura	X	X	X	X	X	X
Leiocephalus	X	—	X	X	—	—
Hispaniolus	—	—	—	[X]	—	—
Celestus	X	X	X	X	—	X
Sauresia	—	—	—	[X]	—	—
Wetmorena	—	—	—	[X]	—	—
Cricosaura	[X]	—	—	—	—	—
Ameiva	X	X	X	X	X	X
Cadea	[X]	—	—	—	—	—
Amphisbaena	X	—	—	X	—	X
Mabuya	—	X	—	X	X	X
Typhlops	X	X	X	X	X	X
Epicrates	X	X	—	X	X	X
Tropidophis	X	X	X	X	—	—
Natrix	X	—	—	—	—	—
Tretanorhinus	X	—	—	—	—	—
Uromacer	—	—	—	[X]	—	—
Alsophis	X	X	—	X	X	X
Leimadophis	X	X	—	X	—	X
Hypsirhynchus	—	—	—	[X]	—	—
Arrhyton	[X]	—	—	—	—	—
Darlingtonia	—	—	—	[X]	—	—
Ialtris	—	—	—	[X]	—	—
Pseudemys	X	X	—	X	—	X
Crocodylus	X	X	—	X	—	—
Total	29	19	10	32	8	17

[1] (X) Introduced; [X] endemic.

Table 2.—Distribution of Hispaniolan species of amphibians and reptiles[1] [for a current list of the island's species, see: http://evo.bio.psu.edu/caribherp/lists/HSP-LIST.HTM].

Genus	Haiti, mainland	Sept Frères	Tortue	Gonave	Petite Gonave	Grande Cayemite	Petite Cayemite	Île à Vache	Beata	Alta Vela	Dominican Republic	Saona
Bufo güntheri	X	—	—	—	—	—	—	—	—	—	X	—
marinus	—	—	—	—	—	—	—	—	—	—	X	—
Hyla dominicensis	X	—	—	—	—	—	—	—	X	—	X	—
pulchrilineata	X	—	—	—	—	—	—	—	—	—	X	—
vasta	X	—	—	—	—	—	—	—	—	—	X	—
heilprini	—	—	—	—	—	—	—	—	—	—	X	—
Eleutherodactylus inoptatus	X	—	—	—	—	—	—	—	—	—	X	—
ruthae	—	—	—	—	—	—	—	—	—	—	X	—
jugans	X†	—	—	—	—	—	—	—	—	—	—	—
ventrilineatus	X†	—	—	—	—	—	—	—	—	—	—	—
flavescens	X	—	—	—	—	—	—	—	—	—	X	—
poolei	X	—	—	—	—	—	—	—	—	—	—	—
glandulifer	X†	—	—	—	—	—	—	—	—	—	—	—
darlingtoni	X†	—	—	—	—	—	—	—	—	—	—	—
glanduliferoides	X†	—	—	—	—	—	—	—	—	—	—	—
minutus	—	—	—	—	—	—	—	—	—	—	X	—
weinlandi	X	—	—	—	—	—	—	—	—	—	X	—
rufifemoralis	—	—	—	—	—	—	—	—	—	—	X	—
schmidti schmidti	—	—	—	—	—	—	—	—	—	—	X	—
schmidti rucillensis	—	—	—	—	—	—	—	—	—	—	X	—
abbotti	X	—	—	—	—	—	—	—	—	—	X	—
femur-levis	X†	—	—	—	—	—	—	—	—	—	—	—
pictissimus	X†	—	—	—	—	—	—	—	—	—	—	—
brevirostris	X†	—	—	—	—	—	—	—	—	—	—	—
audanti	X†	—	—	—	—	—	—	—	—	—	—	—
intermedius	—	—	—	—	—	—	—	—	—	—	X	—
semipalmatus	X†	—	—	—	—	—	—	—	—	—	—	—
montanus	—	—	—	—	—	—	—	—	—	—	X	—
bakeri	X†	—	—	—	—	—	—	—	—	—	—	—
auriculatus auriculatoides	X	—	—	—	—	—	—	—	—	—	X	—
auriculatus wetmorei	X†	—	—	—	—	—	—	—	—	—	—	—
armstrongi	—	—	—	—	—	—	—	—	—	—	X	—
Leptodactylus dominicensis	—	—	—	—	—	—	—	—	—	—	X	—
Gonatodes notatus	X	—	—	X	—	—	—	—	—	—	—	—
Hemidactylus brookii	X	—	—	—	—	—	—	—	—	—	X	—
mabouia	X	—	—	—	—	—	—	—	—	—	—	—
Aristelliger expectatus	X	—	—	X	—	—	—	—	—	X?	—	—
lar	X	—	—	X	—	—	—	—	—	—	X	—
Sphaerodactylus cinereus	X	—	—	—	—	—	—	—	—	—	—	—
copei	X	—	—	—	—	X	—	—	—	—	—	—
stejnegeri	X	—	—	—	—	—	—	—	—	—	—	—
samanensis	—	—	—	—	—	—	—	—	—	—	X	—
difficilis	X	X	—	—	—	—	—	—	—	—	X	—
armstrongi	—	—	—	—	—	—	—	—	—	—	X	—
altavelensis	—	—	—	—	—	—	—	—	—	X	—	—
Xiphocercus darlingtoni	X†	—	—	—	—	—	—	—	—	—	—	—
Chamaelinorops wetmorei	X†	—	—	—	—	—	—	—	—	—	—	—
Anolis ricordii	X	—	—	—	—	—	—	—	—	—	X	—
semilineatus	X	—	—	—	—	—	—	—	—	—	X	—
olssoni	X	—	—	X	—	—	—	—	—	—	X	—
bahorucoensis	—	—	—	—	—	—	—	—	—	—	X	—
distichus dominicensis	X	—	X	—	—	X	X	—	—	—	X	—
distichus juliae	—	—	—	—	—	—	—	X	—	—	—	—
distichus altavelensis	—	—	—	—	—	—	—	—	—	X	—	—
distichus wetmorei	—	—	—	—	—	—	—	—	X	—	—	—
distichus caudalis	X	—	—	X	X	—	—	—	—	—	—	—
cybotes cybotes	X	—	X	—	—	X	—	X	—	—	X	X
cybotes longitibialis	—	—	—	—	—	—	—	—	X	—	—	—
cybotes doris	—	—	—	X	X	—	—	—	—	—	—	—
monticola	X†	—	—	—	—	—	—	—	—	—	—	—
darlingtoni	—	—	—	—	—	—	—	—	—	—	X	—
chloro-cyanus	X	—	X	X	—	—	—	—	—	—	—	X
coelestinus	X	—	—	X	—	X	—	X	—	—	—	—
hendersoni	X	—	—	—	—	—	—	—	—	—	—	—

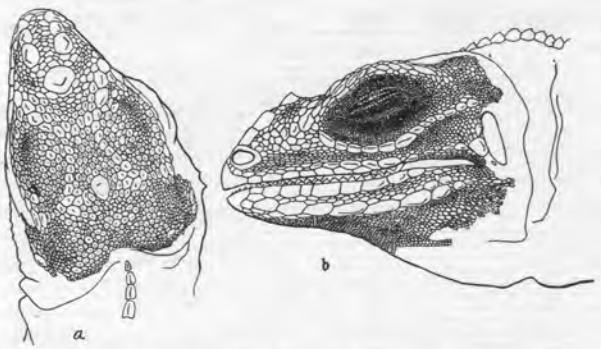
[1] A dagger (†) indicates species peculiar to the southwestern mountains of Haiti.

Table 2.—continued

Genus	Haiti, mainland	Sept Frères	Tortue	Gonave	Petite Gonave	Grande Cayemite	Petite Cayemite	Île à Vache	Beata	Alta Vela	Dominican Republic	Saona
Audantia armouri	X†	—	—	—	—	—	—	—	—	—	—	—
shrevei	—	—	—	—	—	—	—	—	—	—	X	—
Cyclura cornuta cornuta	X	—	X	X	X	X	—	—	—	—	X	—
ricordii	—	—	—	—	—	—	—	—	—	—	X	—
Leiocephalus schreibersii	X	X	X	—	—	—	—	—	—	—	X	—
melanochlorus	X	—	—	—	—	—	—	X	—	—	X	—
personatus personatus	X	—	—	—	—	—	—	—	—	—	—	—
personatus semilineatus	X	—	—	—	—	—	—	—	—	—	—	—
personatus barahonensis	—	—	—	—	—	—	—	—	—	—	X	—
personatus altavelensis	—	—	—	—	—	—	—	—	—	X	—	—
personatus aureus	X	—	—	—	—	—	—	—	—	—	—	—
personatus scalaris	X	—	—	—	—	—	—	—	—	—	X	—
personatus mentalis	—	—	—	—	—	—	—	—	—	—	X	—
personatus lunatus	—	—	—	—	—	—	—	—	—	—	X	—
personatus beatanus	—	—	—	—	—	—	—	—	X	—	—	—
personatus vinculum	—	—	—	X	—	—	—	—	—	—	—	—
personatus louisae	—	—	—	—	—	—	—	—	—	—	—	X
Hispaniolus pratensis	X	—	—	X	—	—	—	—	—	—	—	—
Celestus costatus	X	—	—	—	—	—	—	—	—	—	X	—
darlingtoni	—	—	—	—	—	—	—	—	—	—	X	—
Sauresia sepsoides	X	—	—	X	—	—	—	—	—	—	X	—
Wetmorena haetiana	X†	—	—	—	—	—	—	—	—	—	—	—
Ameiva lineolata lineolata	X	—	—	—	—	—	—	—	—	—	X	—
lineolata beatensis	—	—	—	—	—	—	—	—	X	—	—	—
taeniura	X	—	—	—	—	X	X	X	—	—	X	—
chrysolaema chrysolaema	X	X	X	X	—	—	—	X	—	—	X	—
chrysolaema woodi	—	—	X	—	—	—	—	—	—	—	—	—
chrysolaema abbotti	X	—	—	—	—	—	—	—	X	—	—	—
chrysolaema affinis	X	—	—	—	—	—	—	—	—	—	—	—
barbouri	—	—	—	X	—	—	—	—	—	—	—	—
rosamondae	—	—	—	—	—	—	—	—	—	—	—	X
Amphisbaena manni	X	—	—	—	—	—	—	—	—	—	X	—
innocens	X	—	—	X	X	—	—	—	—	—	—	—
caudalis	—	—	—	—	—	X	—	—	—	—	—	—
Mabuya lineolata	—	—	—	—	—	—	—	—	—	—	X	—
mabouya sloanii	—	—	—	—	—	—	—	—	—	—	X	—
Typhlops lumbricalis	X	—	—	—	—	X	—	—	—	X	X	—
pusillus	X	—	—	—	—	—	—	—	—	—	X	—
Epicrates striatus striatus	X	—	X	—	—	—	—	X	—	—	X	—
inornatus fordii	X	—	—	X	—	—	—	—	—	—	X?	—
gracilis gracilis	X	—	—	—	—	—	—	—	—	—	X	—
Tropidophis maculatus haitianus	X	—	X	X	—	—	—	—	—	—	X	—
Uromacer catesbyi	X	—	X	X	—	—	X	X	—	—	X	—
scandax	—	—	X	—	—	—	—	—	—	—	—	—
frenatus	X	—	—	—	—	—	X	X	—	—	X?	—
wetmorei	—	—	—	—	—	—	—	—	X	—	—	—
dorsalis	—	—	—	X	—	—	—	—	—	—	—	—
oxyrhynchus	X	—	X	X	—	—	—	—	—	—	X	—
Hypsirhynchus ferox	X	—	—	—	—	—	—	—	—	—	X	—
Alsophis anomalus	X	—	X	—	X	—	—	—	—	—	X	—
melanichnus	X	—	—	—	—	—	—	—	—	—	X	—
Leimadophis parvifrons parvifrons	X	—	—	—	—	—	—	—	—	—	—	—
parvifrons lincolni	—	—	—	—	—	—	—	—	X	—	—	—
parvifrons niger	X	—	—	—	—	—	—	—	—	—	X	—
parvifrons protenus	X	—	—	—	—	—	—	—	—	—	X	—
parvifrons alleni	—	—	—	X	—	—	—	—	—	—	—	—
parvifrons tortuganus	—	—	X	—	—	—	—	—	—	—	—	—
parvifrons rosamondae	—	—	—	—	—	—	—	X	—	—	—	—
Darlingtonia haetiana	X†	—	—	—	—	—	—	—	—	—	—	—
Ialtris dorsalis	X	—	—	—	—	—	—	X	—	—	X	—
parishi	X	—	—	—	—	—	—	—	—	—	—	—
Pseudemys stejnegeri vicina	X	—	—	—	—	—	—	—	—	—	X	—
decorata	X	—	—	—	—	—	—	—	—	—	—	—
Crocodylus acutus	X	—	—	—	—	—	—	X	—	—	X	—

[1] A dagger (†) indicates species peculiar to the southwestern mountains of Haiti.

its status can be made. *Crocodylus acutus* is found in Cuba, Hispaniola, Jamaica, Florida, and Central America.



Cyclura cornuta (USNM No. 82107, from Petite Gonave Island, Haiti). See also article on p. 222.

SPECIES ERRONEOUSLY RECORDED FROM HISPANIOLA

The type of *Spelerpes infuscatus* Peters, now in the Berlin Museum (No. 6556), supposedly from "Hayti," has been positively identified by Dr. E. R. Dunn as *Oedipus lineolus* Cope and hence must have come from Mexico (Dunn, 1926). The intensive collecting done during the past few years leaves little expectation of finding any endemic tailed amphibians in the West Indies.

Hispaniolan records of *Eleutherodactylus auriculatus* Cope are undoubtedly based on misidentifications of the several small frogs that bear quite a close resemblance to the rather variable true *auriculatus* of Cuba.

Boulenger's record of a *Dendrobates trivittatus* (1882, p. 145) from "S. Domingo" is probably based on an incorrect locality record, as no true *Dendrobates* is to be expected so far out of its range.

BIOGRAPHICAL SKETCH

Doris M. Cochran (1898–1968)[1]

Doris Mable Cochran was a specialist in Neotropical herpetology and was for many years the custodian of the American national collection at the Smithsonian Institution in Washington, D.C. Her interest in natural history began as a child growing up in a small town near the shores of Lake Erie and, while still an undergraduate at George Washington University (A.B. 1920, M.S. 1921), she became Aide in the Division of Herpetology at the United States National Museum. Although formally under the curatorship of Leonhard Stejneger, Cochran was responsible for the day-to-day administration of the herpetological collections. In 1927, she became Assistant Curator and, in 1942, Associate Curator, before formally taking charge of the collections after Stejneger's death in 1943. In the interim, she earned a Ph.D. at the University of Maryland (1933) with a thesis on crab myology. Eventually promoted to Curator in 1956, she retired in 1968, and died less than a month later.

Cochran's research emphasized the herpetofaunas of southeastern Asia, the West Indies, and South America, particularly those of Brazil and Colombia. She published nearly 90 titles from 1922–1970, most of them short taxonomic papers describing new genera (8) and species and subspecies (125). Her interest in the West Indies spanned a 20-year period and culminated in *The Herpetology of Hispaniola* (1941). Subsequently, she focused most of her attention on South American frogs, about which she published many papers and two books, *Frogs of Southeastern Brazil* (1954) and *Frogs of Colombia* (1970), the latter published posthumously with her longtime collaborator, Coleman J. Goin. She also wrote numerous semi-popuular articles and some wartime booklets for use by the military. Her most widely known book was the profusely illustrated *Living Amphibians of the World* (1961), which was translated into at least ten languages. *The New Field Book of Reptiles and Amphibians* (1970), coauthored with Goin, was not successful and never competed seriously with existing North American field guides by Roger Conant and Robert C. Stebbins.

Doris M. Cochran (photograph courtesy of Kraig Adler).

[1] **Source:** Adler, K. 1989. Herpetologists of the past, pp. 5–141. In K. Adler (ed.), *Contributions to the History of Herpetology*. Society for the Study of Amphibians and Reptiles, Contributions to Herpetology, vol. 5. Ithaca, New York.