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TWO NEW SUBSPECIES OF THE ANGUID LIZARD
WETMORENA FROM HISPANIOLA

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The island of Hispaniola is inhabited by three genera of anguid lizards: *Diploglossus* Wiegmann, which is widespread in both Haiti and the República Dominicana; *Sauresia* Gray, which has a similar distribution but which has recently been regarded as doubtfully separable from *Diploglossus* by Underwood (1959:11), and *Wetmorena* Cochran. The latter genus is monotypic, and has heretofore been known only from the eastern portion of the Massif de la Selle in Haiti; Cochran (1941:262) mentioned specimens from the Mont des Agents Commissaires, near La Visite, Mont Cabaio, and Mont de la Selle, from west to east. Since the Massif de la Selle grades imperceptibly into the Dominican Sierra de Baoruco, without any major geographic feature to divide the two ranges, it was considered not improbable that *Wetmorena* occurred also in the latter range. In fact, prior to Dr. Cochran's herpetology of Hispaniola, at least one Dominican specimen of *Wetmorena* had been collected by W. G. Hassler at Polo in 1932.

In the summer of 1963, Patricia A. Heinlein, David C. Leber, Ronald F. Klinikowski, Richard Thomas and I visited the Sierra de Baoruco, and a series of *Wetmorena* was taken at moderate elevations in these mountains. Previously, in the summer of 1962, Dennis R. Paulson, Miss Heinlein, and Messrs. Leber and Klinikowski visited the area called the Forêt des Pins in the extreme eastern edge of the Massif de la Selle, and there secured a large series of these lizards. When these two series are compared with one another, and additionally compared with material from more eastern La Selle localities it is obvious that three distinct populations of *Wetmorena* are involved. The present large series of *Wetmorena* would not have been collected without the capable

assistance of the above colleagues; I have borrowed specimens for comparison from Dr. Ernest E. Williams of the Museum of Comparative Zoology (MCZ), Dennis R. Paulson (DRP), and Richard Thomas (RT), and wish to thank them for their customary generosity. Paratypes have been deposited in the American Museum of Natural History (AMNH), Museum of Natural History, University of Kansas (KU), and the United States National Museum (USNM). The illustrations are the work of Ronald F. Klinikowski, whom I also wish to thank.

A few comments on Haitian place names are appropriate. Publications by American authors dealing with the Haitian fauna vary in their treatment of Haitian geographical features as well as names of towns or other population centers. Such variations are due to several factors; these include lack of detailed maps of the country, inability to transliterate or understand Haitian *creole* with the result of faulty spellings, translation of Haitian *creole* names into English, and, probably the most common source of uncertainty, the fact that almost every hill, creek, valley, or locality has a locally used name. Use of these latter names without some qualifying distance and direction from a customarily recognized and mapped town are often misleading, difficult for the later worker to locate, or impossible to find on any extant map. Additionally, the same place name may be used repeatedly in various sections of the country (or even in the same general area). Since the same name may be applied to places which differ greatly in elevation and ecology, the simple use of these unlocatable names presents an additional hazard. In an effort to standardize Haitian names (an admittedly almost futile gesture), I have used in the present paper, and will use in succeeding papers, the following two sources: *Geographie d'Haiti*, Paul Pereira, Imprimerie N. A. Theodore, Port-au-Prince, Haiti, and the 28-sheet 1:100,000 map of Haiti printed by Usarcarib Engineers, C.Z. 11-61, and compiled in 1961. The former gives a detailed discussion of the physiographic features and the latter is abundantly annotated with place names. A combination of both, plus the customary oil company maps, facilitates the finding of some—but by no means all—localities used by collectors. Unfortunately, even these two sources are occasionally, and possibly importantly, in disagreement; for instance, Pereira places the Mont des Agents Commissaires to the west of Furcy, whereas the map calls the entire Forêt des Pins region the Mont des Commissaires. These two localities are rather widely separated, and this difference, in the present paper for example, may be crucial. In such cases, without further information, one must be arbitrary in choosing which locality is meant. Also, as has been my custom when dealing with Cuban locality data, I prefer to retain the original (in this case French *creole*) names for all physiographic features and population centers, rather than translating them into English.

Wetmorena haetiana Cochran, as known from the type locality and adjacent localities in the more northern Montagne Noire upon which ridge lies Furcy, is an earless, weak-legged anguid, with an adult snout-vent length varying between 59 and 90 mm. Color-wise, western La Selle specimens dorsally are either unicolor metallic bronze without a pattern, or have a dorsal pattern of scattered dots; the more medial of the dots only occasionally are aligned into two paramedian longitudinal rows. Most striking is the ventral pattern, which is black with large discrete white blotches which extend laterally and dorsally onto the sides, neck, cheeks, and labials (particularly the infralabials) and are especially prominent on the chin. The western population differs also from the Sierra de Baoruco population in scalation as is shown below, and from the Forêt des Pins population in pattern. At Forêt des Pins, the Haitians call *Wetmorena* "sourd," and the race from this area may be named, from the Latin word for "deaf."

***Wetmorena haetiana surda*, new subspecies**

Type: MCZ 77040, an adult male, from Forêt des Pins, 5800', Département de l'Ouest, Haiti, 12 August 1962, by R. F. Klinikowski and natives. Original number X3880.

Paratypes: Albert Schwartz Field Series (ASFS) X1910-12, Forêt des Pins, Dépt. de l'Ouest, Haiti, 30 June 1962, R. F. Klinikowski; AMNH 92079-85, ASFS X3881-83, ASFS X3896-99, ASFS X3912-15, DRP 2450, KU 79715-21, MCZ 77041-48, USNM 150548-53, same data as type; MCZ 61067, Forêt des Pins, Petite Source, Dépt. de l'Ouest, Haiti, 20 February 1959, P. S. Humphrey; MCZ 61068, Forêt des Pins, pines east and northeast of house, Dépt. de l'Ouest, Haiti, 21 February 1959, P. S. Humphrey; MCZ 61069-70, Forêt des Pins, Boucan Chatte, Dépt. de l'Ouest, Haiti, 23 February 1959, P. S. Humphrey.

Diagnosis: A subspecies of *Wetmorena haetiana* characterized by a pair of paramedian dorsal lines, which may occasionally be broken up into longitudinal dashes, the remainder of dorsum with or without about eight rows of longitudinally arranged dashes, venter black with irregularly scattered, small, diffuse pale (gray) areas which are never discrete as in *h. haetiana*, and do not extend onto chin or sides of neck as large whitish blotches. Scalation much as in *h. haetiana*, except that scales around body at axilla and anterior to groin average slightly less.

Description of type: An adult male with a snout-vent length of 81 mm, head width 10.2 mm, tail 69 mm. Scales around body behind axilla, 45; around body just anterior to groin, 36; subdigital lamellae on third toe, 10. Middorsal band 12 scales wide at midbody, dull bronzy with a pair of prominent paramedian longitudinal lines from occiput to above hindlimbs, whence they proceed along upper side of tail in a less clear but nonetheless discernible condition. Head unicolor with back, with some random black flecking. Remainder of dorsum, except for area enclosed by paramedian lines, with about six vague, much fragmented, series of longitudinally arranged dashes, which continue onto the upper

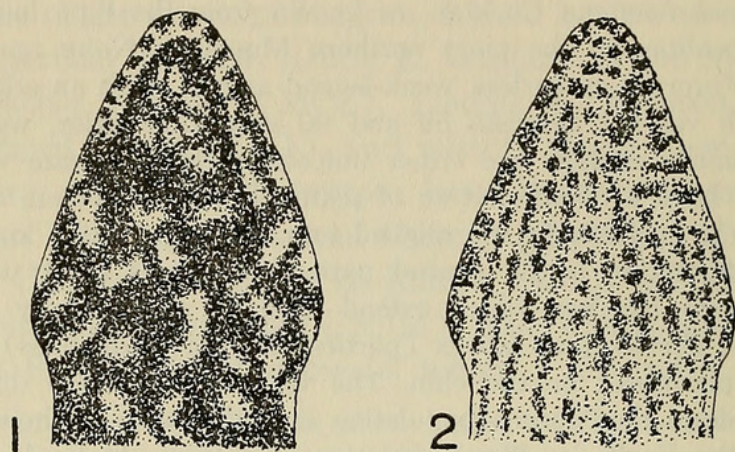


FIG. 1. Ventral view of throat of *Wetmorena haetiana haetiana* (MCZ 67628), showing dark ground color and conspicuous rosettes.

FIG. 2. Ventral view of throat of *Wetmorena haetiana surda* (MCZ 77040, type), showing linear pattern.

surface of the tail (Fig. 3). Sides black, flecked with gray, the black lateral color beginning in the loreal region and extending over the sides of the head as a vague dark mask. Labials dark brown flecked with gray; limbs almost black, and slightly flecked with gray. Venter black and gray, the paler color most prominent on chest, and the black pigment arranged on the belly proper into about four longitudinal lines; in no case on the venter does the pale gray color form large discrete blotches; underside of tail black with some gray dots on the black lateral surfaces.

Variation: The 47 paratypes range in snout-vent length from 97 (MCZ 61067, male) to 35 mm. There is no means of determining sex by scalation; however, adult males are distinctly large headed, and adult females occasionally have developing eggs visible through the pale belly. I have the impression that males reach a larger size than females; this is surely the case in the related genus *Diploglossus*, and is to be expected in *Wetmorena*. The largest female (MCZ 77041) has a snout-vent length of 81 mm and is distinctly slimmer headed than comparably sized males.

Scales around the body anteriorly vary between 41 and 49, posteriorly between 32 and 37; there is a rough difference of 10 scales between the axillary and groin counts in any specimen. The axillary mean is 45.0, the groin mean is 35.4. The third toe subdigital lamellae vary between eight and 11, with nine the modal number (19 individuals).

The width of the dorsal metallic band is either 10, 11, or 12 scales; this count includes the one-half or one-third metallic scales on the edge of the band. Thus, a dorsal band count of 11 means that there are nine scale rows plus two scale rows (one on either side of the band) upon which the metallic color is visible on their medial halves or thirds; a total of 11 scale rows are thus involved in the metallic band coloration. Of the

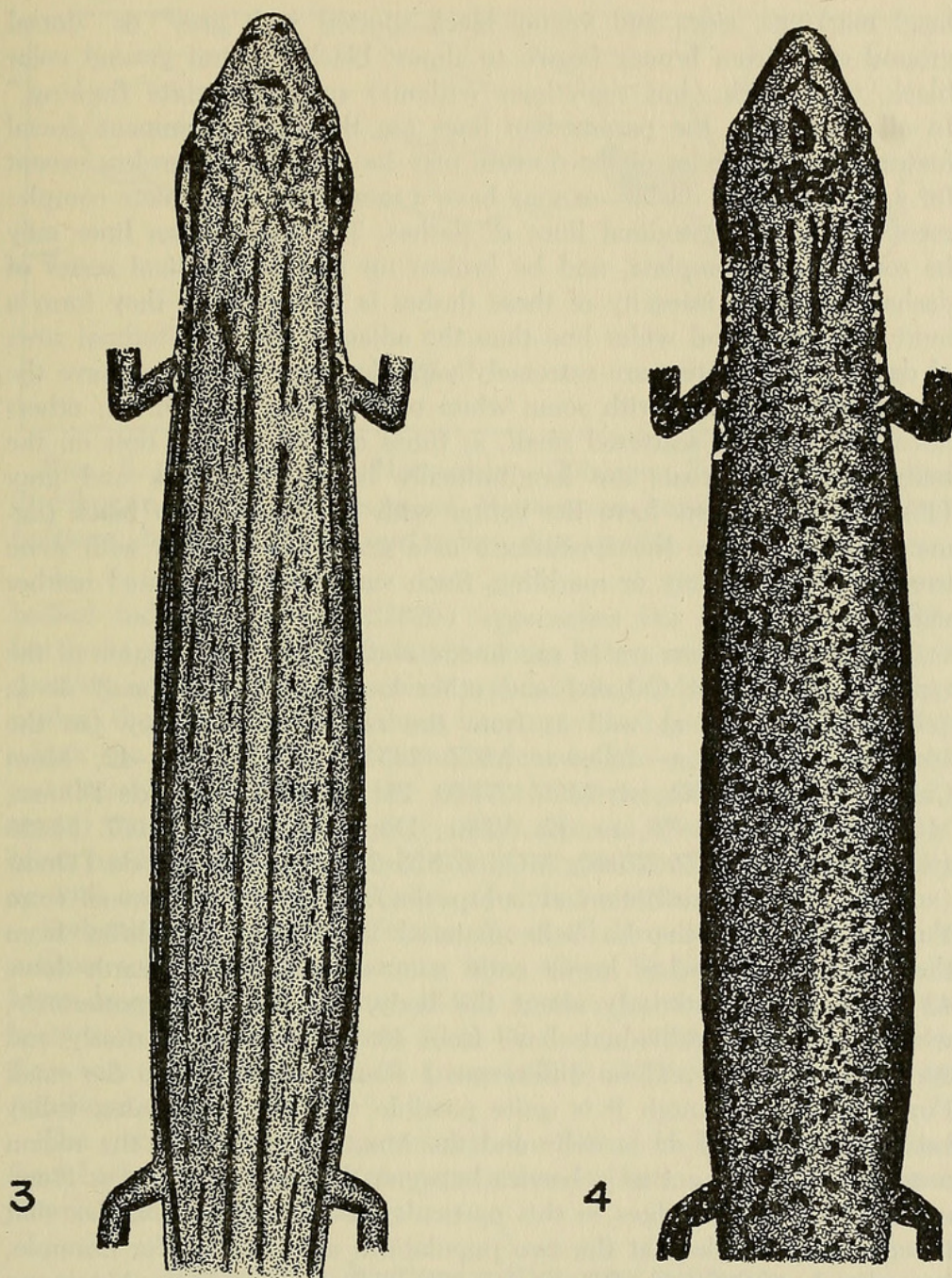


FIG. 3. Dorsal view of *Wetmorena haetiana surda* (MCZ 77040, type).

FIG. 4. Dorsal view of *Wetmorena haetiana mylica* (MCZ 77049, type).

entire series of paratypes (including the type), most (34 specimens) have a dorsal band of 12 scales, with 13 individuals having a band 11 scales wide, and one individual with a ten-scale wide band.

In coloration and pattern, the entire lot is quite uniform. Live individuals were described as "dark bronzy above with black dorsal and

head markings, sides and venter black spotted with gray" or "dorsal ground color from bronzy brown to almost black. Ventral ground color black, often with (but sometimes without) scattered white flecking." In all specimens, the paramedian lines are the most prominent dorsal feature; the remainder of the dorsum may be virtually patternless except for a few scattered dashes, or may have a more or less complete complement of eight longitudinal lines of dashes. The paramedian lines may be somewhat incomplete, and be broken up into longitudinal series of dashes; if so, the integrity of these dashes is obvious, and they form a more prominent and wider line than the adjacent fine longitudinal rows of dashes. The venters are extremely variable; some specimens have the venter entirely black, with some white on the chest and throat; others have few to many scattered small, at times confluent, gray dots on the belly, and the throats are longitudinally lined with black and gray (Fig. 2). Still others have the venter with more gray than black pigment, and thus give the appearance of a gray-bellied lizard with some irregular black dotting or marbling. Such variation is correlated neither with size nor sex.

Comparisons: There are 16 specimens available from the region of the type locality (Mont Cabaio) and other localities in the Massif de la Selle *sensu stricto*, as well as from the region about Furcy (in the Montagne Noire), as follows: MCZ 24536, MCZ 45741-42, Mont Cabaio, Dépt. de l'Ouest; MCZ 37566, Pic la Selle, Dépt. de l'Ouest; MCZ 38269, 38271-76, nr. La Visite, Dépt. de l'Ouest; MCZ 51426 (2 specimens), MCZ 57060, MCZ 67628-29, Furcy, Dépt. de l'Ouest (see Fig. 5 for distribution of subspecies). The five specimens from Furcy agree with the La Selle material in pattern, but differ from the latter in somewhat lower scale counts; thus Furcy lizards have 43 or 45 scales anteriorly about the body, and 34 to 35 posteriorly, whereas La Selle individuals have from 46 to 50 scales anteriorly and 33 to 37 posteriorly. These differences I assume to be due to the small Furcy sample, although it is quite possible that the intervening valley between the Massif de la Selle and the Montagne Noire, in the region near Furcy, might act as a barrier between the two populations. However, the mountain ridges in this particular section are so complex that it seems improbable that the two populations are isolated; for example, immediately to the west of Furcy is a ridge which connects the Montagne Noire to the La Selle.

Differences between the races *surda* and *haetiana* are principally those of pattern. The nominate form is characterized by having a unicolor to dotted dorsum, with occasionally two paramedian rows of dorsal dots—not dashes or lines. Ventrally, the two races are very distinctive. The bellies of *h. haetiana* are black with large, discrete white blotches or rosettes, which extend up onto the sides, and are especially prominent on the neck, cheeks, chin, and labials (Fig. 1). In some individuals, the rosettes are concentrated on the anterior portion of the belly, the posterior being completely black and immaculate. The single pale-

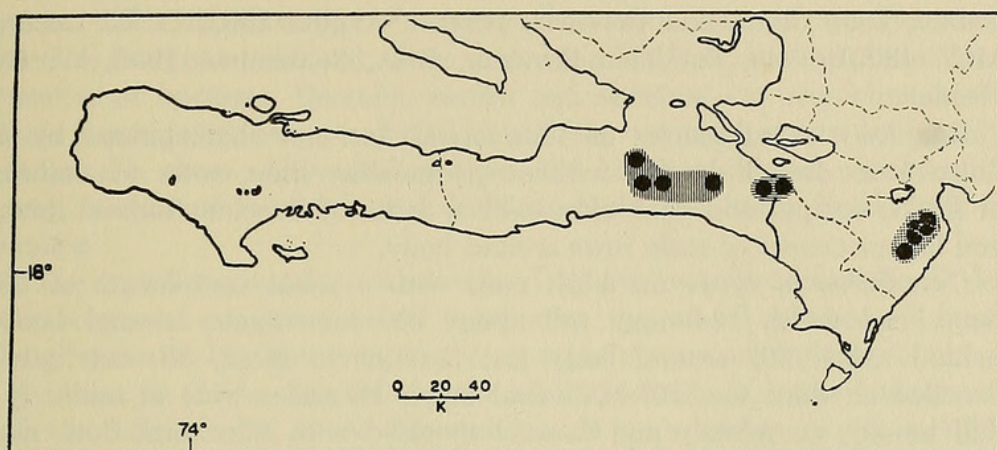


FIG. 5. Southwestern Hispaniola (Tiburon Peninsula), showing distribution of the subspecies of *Wetmorena haetiana*; vertical lines, *haetiana*; horizontal lines, *surda*; fine dots, *mylica*.

bellied individual (MCZ 67629) approaches the condition in *surda*, but lacks the chin and neck lining of the latter, and has extensive pale spotting on the sides of the neck and labials. Cochran (1941:254) described the type as having "about 10 narrow dark brown dorsal stripes of which the central ones are more or less broken up"; these stripes are just barely discernible in the present material and are very fine; I regard them as a series of dots rather than as lines, since they are so often hardly visible as complete lines. Many specimens are patternless or with only the barest indication of dorsal scattered dotting.

Scalewise, *h. haetiana* differs hardly at all from *surda*; in the former, axillary scales around body vary from 43 to 50 (mean, 46.6), in the latter from 51 to 59 (mean, 45.0); posteriorly, the scales around the body in *h. haetiana* vary from 33 to 38 (mean, 36.0), whereas in *surda* they vary between 32 and 37 (mean, 35.4). These differences are not significant.

The populations of *Wetmorena* in the Sierra de Baoruco are distinct from both of the more western populations in Haiti, and for these eastern lizards I propose the name

***Wetmorena haetiana mylica*, new subspecies**

Type: MCZ 77049, an adult male, from 24 km southwest Barahona, 3700' Barahona Province, República Dominicana, taken 2 August 1963, by David C. Leber and Richard Thomas. Original number V161.

Paratypes: MCZ 77050, 10.5 mi. S Cabral, 3500', Barahona Province, R.D., 27 July 1963, D. C. Leber; AMNH 92086-87, 8 km NE Las Auyamas, 2600' Barahona Province, R.D., 28 July 1963, D. C. Leber, R. Thomas; AMNH 92088, ASFS V162-63, ASFS V171-73, ASFS V178, KU 79722-25, MCZ 77051-54, RT 766-67, USNM 150554-57, same data as type; ASFS V185, 21 km SW Barahona, 3000', Barahona Province, R.D., 2 August 1963, R. Thomas; MCZ 77055-56, 10 mi. S

Cabral, 3500', Barahona Province, R.D., 5 August 1963, D. C. Leber; MCZ 43821, Polo, Barahona Province, R.D., September, 1932, W. G. Hassler.

Diagnosis: A subspecies of *Wetmorena haetiana* characterized by a unicolor to dotted dorsum without paramedian lines, rows of dashes, or flecks; occiput and neck often with a series of fine longitudinal lines, and higher counts of scale rows around body.

Description of type: An adult male with a snout-vent length of 88 mm, head width 12.0 mm, tail about 100 mm. Scales around body behind axilla, 50; around body just anterior to groin, 38; subdigital lamellae on third toe, 10. Middorsal band, 13 scales wide at midbody, dull bronzy, completely and densely speckled with fine black dots, not arranged into any longitudinal pattern; occiput and neck with a series of about eight longitudinal lines which become diffuse posterior to the level of the forelimbs; head scales profusely marked with black, so that little of the brown dorsal coloration is apparent (Fig. 4). Top of tail slightly darker than dorsum, likewise dotted with black. Sides, from lores posteriorly onto sides of tail black, with many very small brassy flecks. Labials black, almost unmarked with paler; limbs black. Venter black with irregular scattered or confluent buffy markings, which do not form discrete rosettes; chin black, throat with indications of black longitudinal lines; underside of tail black.

Variation: The 28 specimens range in snout-vent length from 88 mm (the type) to 40 mm; the largest female, which is gravid, has a snout-vent length of 87 mm, and several others approach this female in size. The width of the head of this largest female (USNM 150554) is 9.1 mm, the slimmer head clearly contrasting with the more massive jaw musculature of the adult males.

Scales around the body anteriorly vary between 47 and 56 (mean, 50.7) posteriorly between 36 and 41 (mean, 38.5). The width of the dorsal metallic band is either 11, 12, or 13 scales, with 12 the modal number (16 specimens); only two individuals have counts of 11 and the balance (11 specimens) have counts of 13.

In coloration and pattern, there is much uniformity. The dorsal band ranges from very dark metallic brown to a very pale metallic tan; the black lateral band with its brassy dots is more prominent in light-backed lizards than in dark-backed ones. In none is there an indication of paramedian lines, although all show the fine nuchal lines noted in the type. The dorsum itself may be unpatterned or may be more or less heavily dotted with dark brown to black. In life, the ventral coloration varied between dark brown and black, with the pale areas buffy. There are no clear-cut rosettes or blotches ventrally, and the belly, neck, and throat are variously marked with dark and light without any clear pattern.

Comparisons: From both *haetiana* and *surda*, *mylica* can be distinguished by the higher number of scale rows around the body; although overlap occurs in the number of rows, the means, both anteriorly and posteriorly, between *mylica* on one hand, and *haetiana* and *surda* on the

other, differ significantly. *Wetmorena h. mylica* never shows the parame-dian lines of *surda*, and never shows the black venter with large gray rosettes of *haetiana*. Dorsally, *mylica* and *haetiana* are very close, since both have patternless to dotted dorsa; the ventral pattern will easily distinguish them. Also, *mylica* lacks the black neck and cheeks with gray rosettes of *haetiana*, and *haetiana* lacks the finely lined neck of *mylica*.

The number of scale rows involved in the metallic dorsal band deserves special comment. In all subspecies, the modal number of dorsal band scales is 12. However, in the races *haetiana* and *mylica*, counts of 13 occur; in *surda*, despite a series of 48 individuals, none had counts of 13. Additionally, *surda* has individuals with counts of 10 and 11, whereas no *haetiana* has a count of 11 or below. Use of chi square test on these data shows that the differences observed are significant.

The name *mylica* is an allusion to the type locality, which is a mahogany sawmill in the Sierra de Baoruco; these lizards were especially common under piles of round rocks and boards which fringed the sawmill area.

Remarks: As first pointed out by Mertens (1939:11-12), and later much expanded by Williams in several papers, Hispaniola may be faunistically divided into two major areas, the so-called north and south islands, which are divided by the Cul-de-Sac Plain in Haiti and its extension, the Valle de Neiba. *Wetmorena* is a member of the south island fauna, and is now known from the Massif de la Selle and associated ridges immediately to the north (Montagne Noire), and the Sierra de Baoruco. Its presumed absence from the Massif de la Hotte is probably an artifact of collection. In the La Selle region, *Wetmorena* localities range from elevations of 7,500 feet (Mont Cabaio) and 8,800 feet (Mont la Selle) to 5,000 feet (Furcy). The elevation at Forêt des Pins is 5,800 feet. The localities in the Sierra de Baoruco whence *Wetmorena* has been collected range between 3,700 and 2,600 feet. The considerably lower elevations for *mylica* are at once apparent. Whether this apparent difference in elevation between *mylica* and the western races is real cannot be verified; it may be merely an artifact of the extreme cutting and deforestation of the mountainsides in Haiti between, for example, Kenscoff and Pétionville, where *Wetmorena* may once have occurred. However, the entire Sierra de Baoruco area, in addition to being either well forested or planted with coffee (which forms an excellent pseudo-forest for many silvicolous animals), is distinctly more mesic, at least as compared to the Haitian mountains to the south of Pétionville. It is possible that these more mesic conditions have allowed for lower growth of broad-leaf forests in the República Dominicana, and thus have allowed lower penetration of *Wetmorena*.

Williams (1963) has shown that at least one species of south island lizard (*Anolis hendersoni*) has become differentiated into three extremely well-marked races in the La Hotte-La Selle-Baoruco massif. Although the known range of *Wetmorena* is more restricted than the

known range of *A. hendersoni*, apparently somewhat the same factors may have been at work in allowing for the development of three races of *Wetmorena*. The range of *W. h. haetiana* is roughly comparable to the eastern portion of the range of *A. h. hendersoni* (although *Wetmorena* is absent from lower elevation *hendersoni* localities), whereas the range of *A. h. bahorucoensis* embraces the ranges of both *W. h. surda* and *W. h. mylica*. As yet, intergrades between the races of *A. hendersoni* and those of *W. haetiana* are unknown; this may continue to be the case for some time, since access to much of the south island mountain massif is impossible at the present time.

Although some species, which have evolved on the south island, have penetrated onto the north island, there is no evidence that this is true of *Wetmorena*. A logical place to expect the genus on the north island is the Cordillera Central in the República Dominicana. Intensive collecting in this range has yielded no *Wetmorena*, and here the high elevation *Diploglossus darlingtoni* seems to be the ecological equivalent of *Wetmorena*.

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