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THE *LEIOCEPHALUS* (LACERTILIA, IGUANIDAE) OF HISPANIOLA, II. THE *LEIOCEPHALUS PERSONATUS* COMPLEX.

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ABSTRACT

Examination of 1240 specimens of *Leiocephalus* from Hispaniola revealed that the species *L. personatus* Cope is actually composed of four species: 1) *L. personatus*, with its subspecies *personatus* (north shore of the Tiburon Peninsula), *trujilloensis* (vicinity of Santo Domingo), *mentalis* (extreme eastern República Dominicana), *tarachodes* (north and south of the Bahía de Samaná and including the Península de Samaná), *actites* (northern coast of República Dominicana), *scalaris* (northern Hispaniola, from Cap-Haïtien in Haiti east through the Valle de Cibao in República Dominicana), *budeni* (northern slope of Cordillera Central at intermediate elevations), and *agraulus* (uplands of Cordillera Central near Constanza and southern slopes of same range); 2) *L. lunatus*, with its subspecies *lunatus* (southeastern Dominican coast near Santo Domingo), *arenicolor* (southeastern Dominican coast from San Pedro de Macorís to Boca Chavón), *thomasi* (vicinity of Boca de Yuma), *melaenacelis* (Isla Catalina), *louisae* (Isla Saona); 3) *L. barahonensis* with its subspecies *barahonensis* (northern and eastern foothills of Sierra de Baoruco), *oxygaster* (Península de Barahona), *aureus* (southern Haiti from Jacmel east into southern República Dominicana near Pedernales), *beatanus* (Isla Beata); 4) *L. vinculum* with its subspecies *vinculum* (Ile de la Gonâve), *endomychus* (interior Haiti), *altavalensis* (Isla Alto Velo). The status of *L. eremitus* (Navassa Island) is discussed and this species is considered distinct from any Hispaniolan species. A history of the *personatus* complex is presented and comparisons of the *Leiocephalus* faunas of the Antilles are made; Hispaniola is shown to have the greatest diversity of species, none of which shows any obvious relationship to the Cuban *Leiocephalus*.

INTRODUCTION

Of the five species of the lizard genus *Leiocephalus* occurring on Hispaniola, *L. personatus* Cope, 1862, is the most widely distributed. The description was based upon two syntypes from near Jérémie, Département du Sud, Haiti, near the tip of the Tiburon Peninsula. In the same paper, Cope also described *"Liocephalus trigeminatus"*, also from near Jérémie; presumably (the type cannot presently be found) this description was based upon a female of *L. personatus*, since the description includes notes on the dorsal pattern and coloration which agree with females rather than with males of that species. No further names were proposed for this group of lizards until *barahonensis* Schmidt, 1921, from the western portion of the República Dominicana, and this was followed by *beatanus* Noble, 1923, from Isla Beata and *vinculum* Cochran, 1928, from Ile de la Gonâve. During the next decade, the populations from the northern portion of Hispaniola (*scalaris* Cochran and *mentalis* Cochran, 1932), from Isla Alto Velo (*altavelensis* Noble and Hassler, 1933), southern Haiti (*aureus* Cochran, 1934), southern República Dominicana (*lunatus* Cochran, 1934) and Isla Saona

(*louisae* Cochran, 1934) were named. Finally, two southern coastal Dominican populations (*trujilloensis* Mertens, and *arenicolor* Mertens, 1939) and a northern Dominican subspecies (*pulcherrimus* Mertens, 1939) were described—a total of thirteen named subspecies. Cochran (1941:217) also included *L. semilineatus* Dunn as a subspecies of *L. personatus,* but this form is a distinct species.

My collecting efforts in Hispaniola between 1962 and 1964 showed that, as Cochran (*op. cit.*: 202) had surmised, there were several additional distinct subspecies Inasmuch as there were also fourteen lizards which Dr. Cochran was unable to place in any category known at that time, and since several subspecies had been described and were known from only single localities, or at best were very poorly represented in collections in the past, it seemed appropriate to discuss this species as a whole in the light of the large body of recently acquired material.

I have had the very capable assistance in the field in Hispaniola from the following: Miss Patricia A. Heinlein, and Messrs. Donald W. Buden, Ronald F. Klinikowski, David C. Leber, and Richard Thomas. I am very grateful for their efforts in securing these lizards, and I am especially in the debt of Messrs. Leber and Thomas for their visit to Isla Beata and to Mr. Thomas for his visit to Isla Saona. Except for typical material of new forms, all specimens collected by us are in the Albert Schwartz Field Series (ASFS) or the collection of Richard Thomas (RT). The collections of the Museum of Comparative Zoology (MCZ) at Harvard University, assembled through the efforts of Dr. Ernest E. Williams, have been indispensable; the fresh and well preserved specimens from Haiti have aided immeasurably in the study of the *L. personatus* complex in that country. I have also used specimens in the following collections, and wish to extend my thanks to the respective curators for the loan of interesting and significant material: American Museum of Natural History (AMNH), Charles M. Bogert and George W. Foley; Carnegie Museum (CM), Neil D. Richmond and Clarence J. McCoy; Natur-Museum and Forschungs-Institut Senckenberg (SMF), Konrad Klemmer; United States National Museum (USNM), Doris M. Cochran and James A. Peters. Paratypes of new forms have been placed in the University of Florida Collections (UF), the University of Illinois Museum of Natural History (UIMNH), and the Museum of Natural History, University of Kansas (KU), as well as in the above collections. I wish especially to thank Dr. Wayne King for his delineations of the lateral and ventral views of various subspecies in the *L. personatus* complex. His careful work has aided immeasurably in the visualization of the descriptions.

The Problem

I have had 1240 specimens available for study. Of these, 552 were collected by myself and parties, and are carefully documented as to locality, coloration, and pattern. The number of specimens examined far exceeds the 224 lizards available to Dr. Cochran at the time of her study of Hispaniolan herpetology, and amplifies both her conclusions and those reached by Mertens (1939).

It early became evident in our Hispaniolan collecting that the lizards assigned to *L. personatus* were an unusually variable lot. Specimens from the Península de Barahona, for example, are quite different in aspect, coloration, and pattern from lizards from the Valle de Cibao in the northern República Dominicana. It seemed likely that several distinct species were confused under the name *L. personatus.* In studying these lizards in the laboratory, the above suspicion was rapidly confirmed; there are four distinct species presently grouped under the name *L. personatus* Cope. Not only are there radically different features of pigmentation and pattern, but also striking differences in scalation, involving the dorsal crest scales, the size of the preauricular scale, and the completion of the supraorbital semicircles. Additionally, in at least one case, the ranges of two "subspecies" overlap along the southeastern Dominican coast. The traditional counts of dorsal crest scales in occiput-vent distance and in occiput-axilla distance, the number of trunk dorsals, subdigital fourth toe tricarinate scales, loreals and temporals overlap broadly between the four species herein recognized; these counts do, however, have some effectiveness in

separating subspecies, as do also details of pattern and coloration. Details of head scale terminology used in this paper are shown in Figs. 1, 2 and 9.

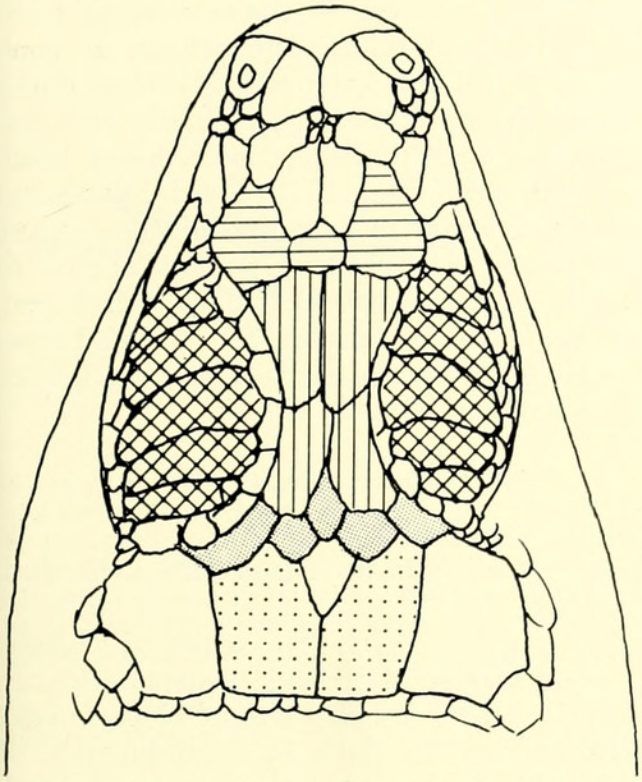

Figure 1. Stylized dorsal view of *Leiocephalus* (based on Schmidt, 1921, Bull. Amer. Mus. Nat. Hist., 44(2), fig. 11) to show head scale terminology employed in the present paper, as follows: prefrontal row, horizontal lines; median head scales, vertical lines; frontoparietal row, dense stippling; parietals, open stippling; supraoculars, crosshatching. Counts on this specimen are: prefrontal row complete, 3 scales; median head scales 4; frontoparietal row complete, 5 scales; supraoculars 5/5; supraorbital semicircles complete; parietal scales in contact.

In general, the four species (whose characters are shown in Table I on p. 49) show cogent geographical distributions. *L. personatus* is widespread, occurring along the northern coast of the Tiburon Peninsula, and throughout much of the República Dominicana except along the southeastern coast. This latter area (as well as Isla Saona and Isla Catalina) is occupied by *L. lunatus* Cochran. The southeastern portion of the Tiburon Peninsula and the Península de Barahona (including Isla Beata) is inhabited by *L. barahonensis* Schmidt. The fourth species, *L. vinculum* Cochran, has a split distribution, including the central Haitian mainland, Ile de la Gonâve, and Isla Alto Velo to the south of Isla Beata. These distributions will be discussed in detail later in the present paper.

I cannot distinguish any differences between the hemipenes of the four species in the *personatus* complex, and in fact these organs do not differ strongly from the he-

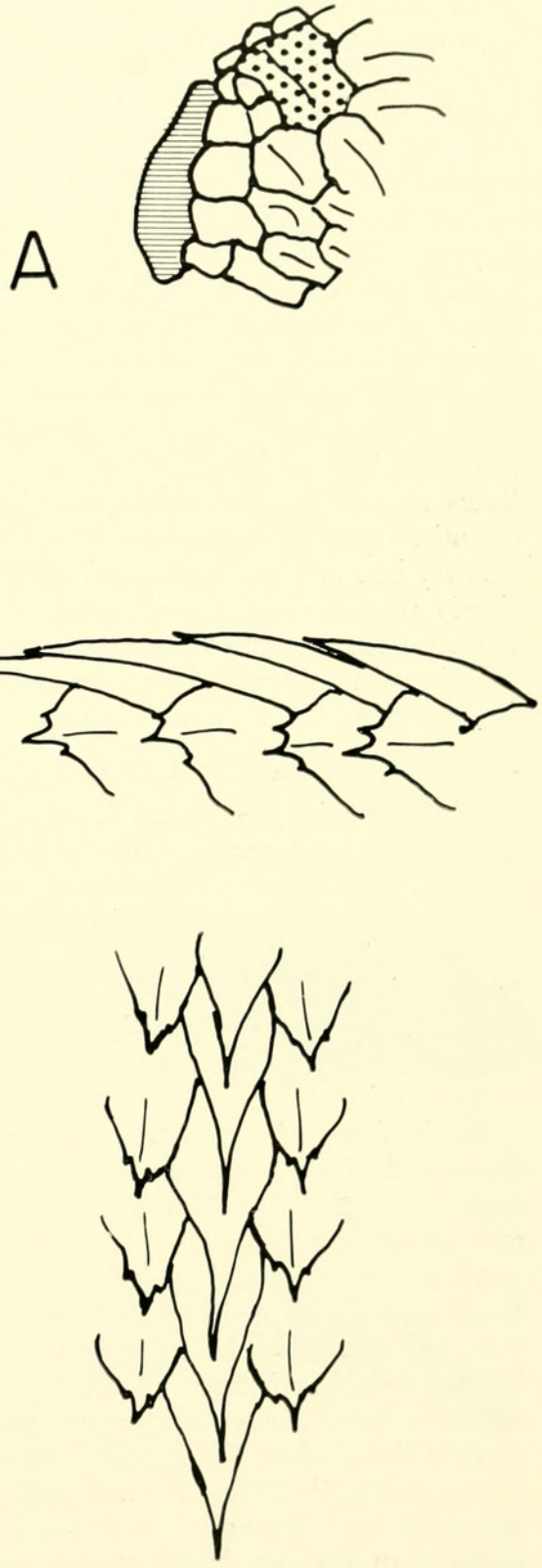

Figure 2. Scale features of *L. personatus* and *L. lunatus*, showing a) auricular opening (horizontal lines) and preauricular scale (stippled); b) lateral view of median dorsal crest scales; and c) dorsal view of median dorsal crest scales.

mipenis of *L. melanochlorus* (see Schwartz, 1966). The hemipenis in *L. lunatus* (based upon ASFS X7764) is typical of these organs for the entire complex. The hemipenis is moderately large, extending the length of about six subcaudal scales. The sulcus is deep and prominent and is formed laterally by an extensive membranous flap from the base of the organ to near the tip. The non-sulcate surface has a series of about four flounces (which extend around the organ to near the sulcus) which rather abruptly merge into a series of about six rows of calyces. The tip of the hemipenis is smooth, weakly bifurcate and much crenulated, the sulcus extending into a cordate terminal area which includes a very weak pair of papillae. From these papillae, a raised area continues down the non-sulcate surface, expands on its proximal half, and ends at the level of the flounces on the non-sulcate surface. In the other species, the number of basal flounces may be more numerous and extend more clearly into the calyculate region, but these characteristics are variable and there are no prominent hemipenial differences among the four species.

Systematic Account

Leiocephalus personatus Cope, 1862

Liocephalus personatus Cope, 1862, Proc. Acad. Nat. Sci. Philadelphia, 14:182 (type locality — near Jérémie, Dépt. du Sud, Haiti).

Liocephalus trigeminatus Cope, 1862, Proc. Acad. Nat. Sci. Philadelphia, 14:183 (type locality—near Jérémie, Dépt. du Sud, Haiti).

Definition: A species of *Leiocephalus* characterized by a combination of 1) moderate size (males to 86 mm, females to 63 mm snout-vent length), 2) distinctly sexually dichromatic, and males with a prominent pair of enlarged postanal scales, 3) absence of a lateral fold, 4) dorsal scales imbricate, weakly tricuspid or denticulate, and keeled, ventral scales imbricate, smooth, and weakly denticulate, 5) median dorsal crest scales enlarged (Fig. 2b and c), greatly attenuate and strongly overlapping, much lower than median dorsal caudal scales, 41 to 64 in occiput to vent distance, 6) one half midbody scales 18 to 28, 7) supraoculars usually 6/6, 8) loreals 2 - 10, 9) temporals 7 - 14, 10) supraorbital semicircles usually complete (in all but one subspecies), 11) parietals usually in contact, 12) median head scales varying between 4 and 6 (mode 4), 13) preauricular scale small,[1] 14) throat in males varying from solid black to immaculate yellow, in some races with a few scattered and diffuse dusky spots but never heavily, regularly and discretely dotted, in females with heavy black to dark gray dots, 15) ventral color some shade of bright to deep green, yellow-green, or yellow, 16) ventral pattern absent in males, venter heavily dotted with dark gray to black dots in females, 17) a dark brown to black mask in males, and 18) black neck and shoulder blotches absent.

Leiocephalus personatus personatus Cope, 1862

Type locality: near Jérémie, Dépt. du Sud, Haiti.

Syntypes: MCZ 3615, two males with snout-vent lengths of 73 and 77 mm.

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of solid black throat confluent with a black loreal - temporal - lateronuchal area (Figs. 4a, 5a), three to five transverse dark dorsal bars on the neck and shoulders, a broad dorsal zone bounded by wide pale dorsolateral longitudinal lines; size large (males to 79 mm, females to 62 mm snout-vent length) high number of loreals (mean 5.6) and temporals (mean 11.1), and median head shields modally 5, frontoparietals modally 4.

Distribution: The northern portion of the Tiburon Peninsula in Haiti, from near Jérémie in the west, east or least to Leogâne; records from Furcy considered doubtful and "Bellevue" unlocatable but possibly farther east than Leogâne (see discussion); a single specimen from Aquin, Dépt. du Sud (Fig. 3).

Variation and discussion: The series of 55 *L. p. personatus* has the following scale counts: dorsal crest scales occiput-vent 47 -

[1] The term "preauricular" scale requires definition. I use this name for an upper temporal scute which lies just above and anterior to the auricular opening (Fig. 2a). It is the largest of the temporals and in *L. barahonensis* is greatly enlarged, whereas in the remaining three species, it is considerably smaller and not especially enlarged in comparison with the temporals ventrad to it.

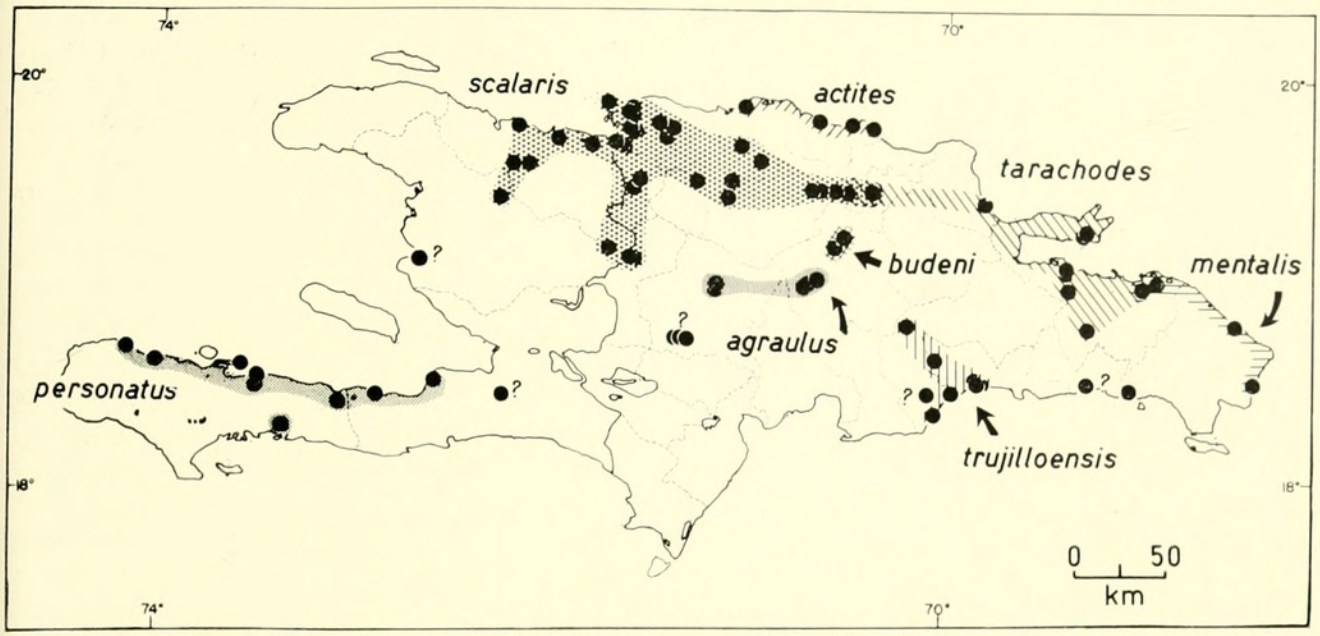

Figure 3. Hispaniola, showing the known distributions of the subspecies of *L. personatus*, as follows: *personatus*, fine stippling; *trujilloensis*, widely spaced vertical lines; *mentalis*, horizontal lines; *tarachodes*, diagonal lines, upper left to lower right; *actites*, diagonal lines, upper right to lower left; *scalaris*, coarse stippling; *budeni*, crosshatching; *agraulus*, fine vertical lines. Overlap of symbols of *tarachodes* and *mentalis* indicates genetic influence of the former in the topotypical population of the latter. Overlap of symbols of *tarachodes* and *scalaris* shows areas of intergradation. Note disjunct range of *L. p. personatus* from the balance of the species. Questioned symbols indicate either dubious record (Furcy) or small samples presently not assignable to subspecies.

61 (mean 53.5), dorsal crest scales occiput-axilla 16-27 (mean 21.1), dorsal crest scales on trunk 24-40 (mean 32.4), one half midbody scales 20-26 (mean 22.9), subdigital fourth toe tricarinate scales 20-25 (mean 22.9), loreals 3-9 (mean 5.6), temporals 7-13 (mean 11.1), supraoculars 6/6 (26 specimens, 5/5 (1), 5/6 (4), 6/7 (12), 7/7 (11), 7/8 (3), 8/8 (1), semicircles usually complete (90.0 percent), and parietals usually in contact (94.9 percent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 2 and 9 (mode 5), and the frontoparietal row has 0 to 5 scales (mode 4); the prefrontal row is always complete (61 specimens) and the frontoparietal row is usually complete (51 of 59 specimens). The largest male has a snout-vent length of 79 mm, the largest female 62 mm; the male is from Grand Boucan and the female from L'Acul.

Although I have collected within the range of *L. p. personatus*, I have not seen this subspecies in life; consequently the discussion of coloration and pattern is much abbreviated. Adult and subadult males (with snout-vent lengths in excess of about 65 mm) have the throat solid black, this color continuing dorsally onto the sides of the neck and the temporal region. A male with a snout-vent length of 65 mm shows an intermediate condition wherein the black throat pigment is limited to a few dark and diffuse throat

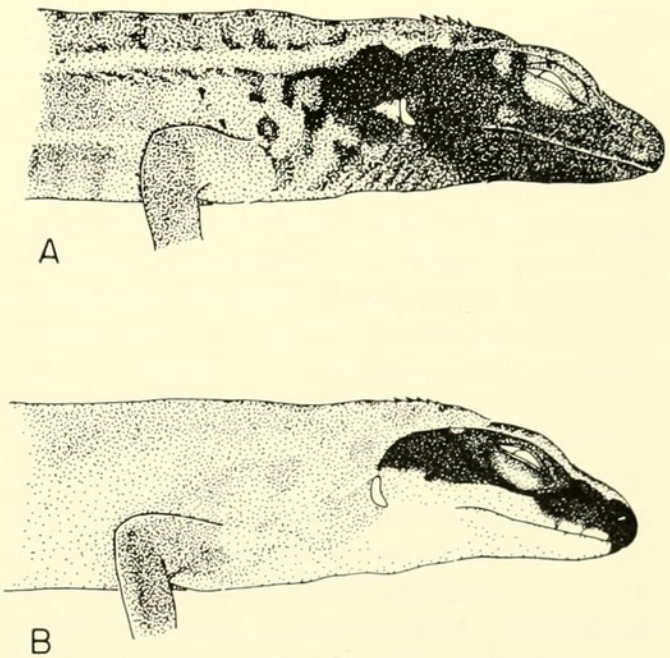

Figure 4. a) *L. p. personatus*, lateral view of head and neck, MCZ 74636, adult male, from Roseaux, Dépt. du Sud, Haiti. b) *L. p. mentalis*, lateral view of head and neck, MCZ 75131, adult male, from Juanillo, La Romana Province, República Dominicana.

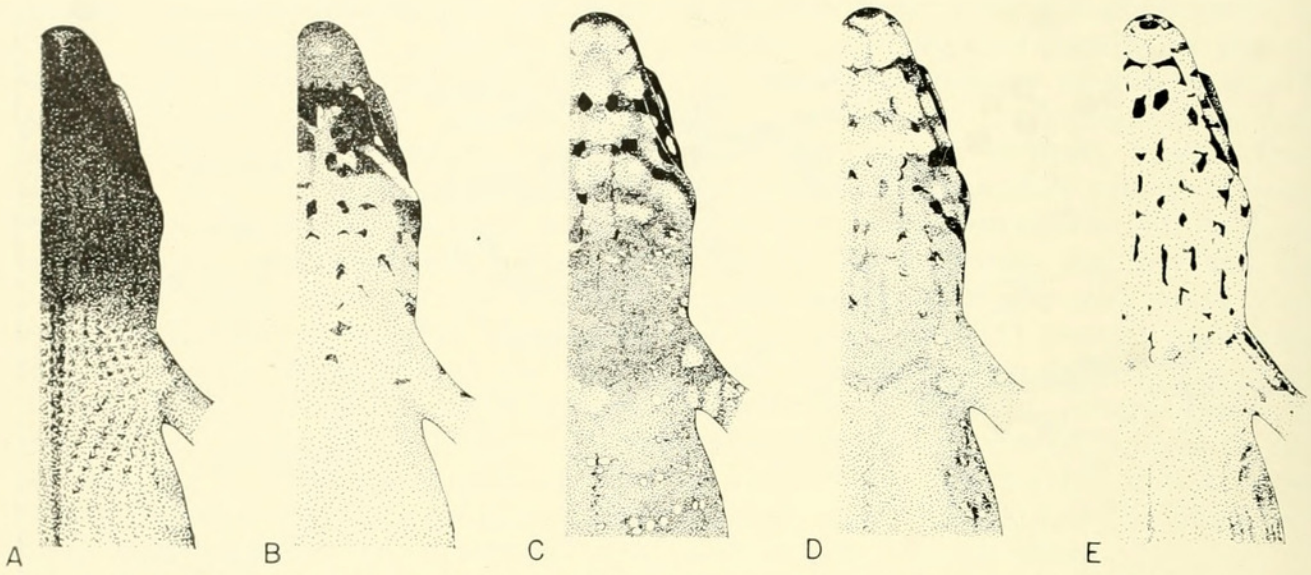

Figure 5. Ventral view of throat of male of five subspecies of *L. personatus*, as follows: a) *L. p. personatus*, MCZ 74636, Roseaux, Dépt. du Sud, Haiti; b) *L. p. trujillo-ensis*, ASFS X7734, 2.2 km SW Río Ozama, Santo Domingo, Distrito Nacional, República Dominicana; c) *L. p. tarachodes*, MCZ 81087, holotype, 6 km SE Nagua, María Trinidad Sánchez Province, República Dominicana; d) *L. p. actites*, MCZ 81088, holotype, Sosúa, Puerto Plata Province, República Dominicana; e) *L. p. budeni*, MCZ 81089, holotype, 12 km NE Jarabacoa, 2000 feet, La Vega Province, República Dominicana.

spots, some heavy and irregular blotching along the sides of the lower jaw, and a prominent black mask. Two younger males (snout-vent lengths 40 mm and 52 mm) show the throats dotted with dark in the fashion of females. The neck and shoulders are crossed by three to five transverse dark bars, and at times these bars are expanded medially to give an irregular black median dorsal nuchal figure (USNM 80776). In other lizards, the transverse bars are somewhat reduced but always there is at least a scapular transverse bar present. The dorsal pattern consists of a median wide brown zone, bounded laterally by broad dorsolateral pale lines; there is a pale lateral line between the limbs and both above and below this line the sides are tannish to gray; considering the bright lateral colors of other races of *L. personatus*, doubtless these lateral areas have an admixture of green and reddish scales in life. The ventral color is presently grayish-blue to tan, but Cochran (1941: 214) who had seen some of this material when it was more fresh, called the ventral coloration "china blue". I suspect that originally the coloration was some shade of green, the typical ventral color of the species *personatus*. The tail is rather weakly chevronate with dark pigment, and the ground color is brown. A sacral transverse bar is sometimes manifested.

The females lack the dark throat and head coloration of the males, and the dorsal zone has a series of complete or incomplete chevrons. The lateral fields are tan with dark vertical brown bars especially on the neck and above the forelimbs. The mask is restricted to a dark-edged temporal rectangle, and both the dorsolateral and lateral pale lines are usually prominent. The throat is heavily spotted with dark gray to black spots, and this pattern continues onto the venter, although the dots may be reduced centrally on the latter region. In some (MCZ 74630) the pale interspaces on the throats have additional dark pigmentation, thereby giving the throat a very densely pigmented appearance.

In general, the pigmentation of young males and adult females is comparable, although young males lack the very heavy ventral spotting that females usually possess.

L. p. personatus is known from the northern shore of the Tiburon Peninsula in Haiti (Fig. 3). This subspecies occurs from near Jérémie (the syntypes) east of Leogâne, and inland to 6 miles (9.7 km) southwest of Miragoâne. The single isolated female (USNM 72613) from Aquin near the south coast, with a snout-vent length of 54 mm, resembles females of *personatus* in all ways. Since females are seldom diagnostic of the subspecies of *L. personatus*, this individual

does not allow complete assurance that *personatus* is the subspecies in this more southern region. There is no justification for considering otherwise, however.

Five specimens (MCZ 8720, 8722-25) from Furcy are clearly *L. p. personatus*; the two males have the typical black throats and heads. However, since neither ourselves nor others have taken any specimens of this lizard at Furcy, despite intensive collecting in that region on the Montagne Noire, I consider the locality dubious. Another specimen (MCZ 25434) from 3 miles (4.8 km) north of Bellevue, Haiti, is also presumably *L. p. personatus* (the specimen is a female). The name Bellevue is a commonplace in Haiti, and although there is a district by this name to the immediate south of Carrefour and west of Port-au-Prince, there is no certainty that this is the locality referred to; it is possible that *L. p. personatus* occurs east of Leogâne, the presently easternmost locality whence it has been definitely recorded.

Another specimen (USNM 75906) requires mention here; it will be discussed in detail later. This lizard is from "Bayeux, near Port-au-Prince" and might be assumed to represent *L. p. personatus*. The lizard is, however, *L. barahonensis*. I cannot locate "Bayeux" on any modern map. As will be shown later, this specimen likely did not originate in this region since it is referrable to *L. b. aureus*.

L. p. personatus is primarily coastal. Other than the specimen from 6 miles southwest of Miragoâne, all records are from near the coast. The highlands of the Massif de la Hotte and Massif de la Selle must act as a southern barrier for this species (although the specimen from Aquin indicates that *L. personatus* has crossed these mountains somewhere). Other than the syntypes, there is only one series (14 specimens) from Roseaux, about 15 kilometers southeast of Jérémie, from this general region. Considering the abundant material of *L. melanochlorus* from the same area (but none of this latter species from Roseaux), it is probable that *personatus* greatly outnumbers *melanochlorus* near the type locality of both species. *L. p. personatus* is known to be sympatric (but likely not syntopic) only with *L. melanochlorus* and only in the Jérémie region. If the *personatus* from Furcy are correctly labelled, sympatry between *personatus* and *melanochlorus* occurs there as well. I have given detailed reasons elsewhere (Schwartz, 1966) for considering that the two species do not occur there.

Specimens examined: Haiti, Dépt. du Sud, near Jérémie, 2 (MCZ 3615, syntypes); Roseaux, 14 (MCZ 74626-39); Grand Boucan, 14 (USNM 80774-87); 10 mi. (16.1 km) E Baradères, 4 (USNM 80763-66); Petit Trou de Nippes, 9 (USNM 80788-89, 80791-92, 80794-98); Aquin, 1 (USNM 72613); 6 mi. (9.7 km) SW Miragoane, 1 (MCZ 25433); *Dépt. de l'Ouest,* L'Acul, 6 (USNM 72607-12); Leogane, 4 (MCZ 13834-37); 3 mi. (4.8 km) N Bellevue (not mapped), 1 (MCZ 25434); "Furcy", 5 (MCZ 8720, 8722-25).

Leiocephalus personatus trujilloensis Mertens, 1939

Leiocephalus personatus trujilloensis Mertens, 1939, Abh. Senckenberg. Naturf. Ges., 449:45.

Type locality: coast at the German-Dominican Tropical Research Institute in Ciudad Trujillo (= Santo Domingo), about 4 km west of the mouth of the Río Ozama, Distrito Nacional, República Dominicana.

Holotype: SMF 26213, an adult male with a snout-vent length of 78 mm (*fide* Mertens, *loc. cit.*).

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of greenish-orange throat with black smudges (Fig. 5b), confluent on sides of head and neck with a black mask, transverse neck bars reduced or absent, a broad dark brown to rich reddish-brown dorsal zone, in fully adult males not bordered by pale dorsolateral lines, and dotted with bright yellow; size moderate (males to 78 mm, females to 60 mm snout-vent length), low number of loreals (3.7), median head shields modally 4, frontoparietals modally 5.

Distribution: South central República Dominicana, from coastal San Cristóbal Province (Sabana Grande de Palenque) east to the Río Ozama (Santo Domingo), and into the interior as far as the vicinity of Villa Altagracia, San Cristóbal Province (Fig. 3); specimens from the city of San

Cristóbal and east at the Río Cumayasa atypical (see discussion).

Variation and discussion: The series of 23 *L. p. trujilloensis* has the following scale counts: dorsal crest scales occiput-vent 47 - 57 (mean 52.3), dorsal crest scales occiput-axilla 15 - 21 (mean 19.1), dorsal crest scales on trunk 28 - 42 (mean 33.1), one half midbody scales 19 - 25 (mean 21.7), subdigital fourth toe tricarinate scales 19 - 24 (mean 21.4), loreals 3 - 10 (mean 3.7), temporals 7 - 12 (mean 9.4), supraoculars 6/6 (9 specimens), 4/4 (1), 5/5 (8), semicircles usually complete (72.7 percent), and parietals always in contact (100 percent). The prefrontal row consists of 3 scales in all specimens, the median head shields vary between 4 and 5 (mode 4), and the frontoparietal row has 2 to 5 scales (mode 5); the prefrontal row is always complete (24 specimens) and the frontoparietal row is usually complete (16 of 20 specimens). The largest male examined by me (UIMNH 44700, a paratype) has a snout-vent length of 75 mm, but Mertens (*op. cit.*:46) gave the snout-vent length of the type as 78 mm. The largest female has a snout-vent length of 60 mm and is from the city of Santo Domingo.

The coloration of freshly collected males may be seen from the following notes on a specimen from Santo Domingo. The dorsum is rich reddish-brown, without dorsolateral pale longitudinal lines; each scale has a yellow dot, thus giving a flecked appearance dorsally. There are about five very diffuse black nuchal and scapular transverse bars, but these are barely visible. The top of the head is brown, with black pigment in the sulci between the scales, and the sides of the head and the chin are deep brown, forming a conspicuous mask. The throat is greenish-orange; anteriorly this color is completely obscured by the dark brown chin pigment, and posteriorly the throat has many fairly large and irregular dark brown smudges. The ventral ground color is greenish-orange, the orange pigmentation due to the deposition of red earth in the epidermis. The underside of the tail is deep reddish (brick) and the underside of the hindlimbs greenish-yellow.

In younger males, the dark brown dorsal band is outlined by buffy dorsolateral lines, and the sides are tan to buffy with mixed red and yellow-green scales. The ventral ground color is pale yellow-green; the chin is bright to pale yellow and heavily smudged with black to dark brown. The underside of the tail is brick to orange, and the sides of the head have creamy to dull orange markings (these head markings are completely obscured by the dark brown mask in fully adult males). The hindlimbs are green to yellowish-green above. The tail is brown, with faint chevrons distally.

Females are like males in dorsal coloration, but have the dorsolateral lines buffy and prominent, and the dorsal zone in young females has about 7 or 8 transverse bars anterior to the hindlimbs. The ventral ground color is dirty yellow, and both the throat and venter are heavily spotted with dark gray to black. Three very young males (snout-vent lengths 47 mm and less) have the female pattern, but this is quickly lost in *trujilloensis*, since two young males with snout-vent lengths of only 42 and 48 mm already show the adult male throat and head pattern, and the reduction of the young male belly dotting.

Four specimens require separate comment; MCZ 75138 from San Cristóbal, San Cristóbal Province, AMNH 7556 from San Pedro de Marcorís, San Pedro de Marcorís Province, and ASFS X8231-32, from the Río Cumayasa, 17 km W La Romana, La Romana Province. The first of these is a large adult male (73 mm) which theoretically should be assignable to the race *trujilloensis*. However, it is pale in color, and has the throat with only vague dusky smudges and no indication of a black face and chin. It may represent another subspecies of *L. personatus*, although I consider this unlikely since specimens from nearby (Sabana Grande de Palenque) are typical *trujilloensis*.

The lizard from San Pedro de Marcorís (a young male, snout-vent length 60 mm), and the two specimens from the Río Cumayasa (two males, snout-vent lengths 62 mm and 52 mm) are all much like the San Cristóbal specimen. Despite the fairly large size of the one male from the Cumayasa, it too lacks any extensive dark chin and face pigmentation. In life, these Cumayasa specimens were grayish-tan dorsally with distinct grayish-buffy dorsolateral lines, and had the sides dotted orange and green.

The throat of the adult has only a few very pale dusky smudges, whereas that of the smaller male has fairly conspicuous dusky markings.

These four specimens are all close to one another in throat pattern. I cannot reconcile them with the much more heavily marked and brightly colored males from the type locality. The status of these four specimens must await further material.

Little need be said concerning comparisons of the races *personatus* and *trujilloensis*. Males are easily distinguished in that the former has a black face and throat, with no indications of dusky throat spotting, whereas the face and throat in *trujilloensis* are dark brown, and the throat always has some indication of dusky smudging. In *personatus*, there is usually a dorsal zone set off by dorsolateral pale lines, whereas adult *trujilloensis* males lack dorsolateral lines. Females of the two races are not distinguishable.

The type localities of both *L. p. trujilloensis* and *"L. p. lunatus"* Cochran are Santo Domingo. Mertens *(loc. cit.)* had considered (and his material confirmed this assumption) that *trujilloensis* was the subspecies to the west of the Río Ozama and *lunatus* the race to the east of that river. Our data indicate that such is not the case; aside from the fact that present collections show the occurrence of *L. personatus* (but apparently not *trujilloensis*) to the *east* of the Ozama, we also have specimens of *lunatus* from the *west* of that river. As has been pointed out, I regard *personatus* and *lunatus* as distinct species. They are not easily confounded, and examples of *L. lunatus* are quickly separable from *L. personatus* where the two species occur together.

In Santo Domingo itself, *L. p. trujilloensis* occurs with some abundance in abandoned lots and even on lawns and along sidewalks. At Sabana Grande we took specimens in a coastal *Cocos* grove where the lizards were not particularly common. The specimens from the Río Cumayasa were taken on rocks near the bluff of the river valley. There is no information on the precise difference in habitat between *lunatus* and *personatus* in this region of overlap, although I have the impression that *L. lunatus* prefers more xeric habitats such as beaches.

Aside from the coastal localities, *L. p. trujilloensis* has been taken inland near Villa Altagracia, and Mertens *(loc. cit.)* mentioned a specimen taken at kilometer 37 on the road between Santo Domingo and La Vega; this individual also came from the vicinity of Villa Altagracia and doubtless is assignable to *trujilloensis*.

The closest approximation of *L. p. personatus* and *L. p. trujilloensis* is about 275 km airline (Villa Altagracia and Leogâne). However, there are specimens of *L. personatus* more or less from the intervening area which will be discussed later. Much of the region between these two localities is extremely arid (Llanos de Azua, Valle de Neiba, Cul de Sac Plain), and these dry regions are inhabited by two other species of *Leiocephalus (semilineatus* and *schreibersi)*, as well as in part (marginally) by *L. barahonensis*. Probably the distribution of *L. personatus* in the east will be found to approach closely to the city of Baní, Azua Province; this town lies about on the borderline between the arid Llanos de Azua and the more mesic eastern coastal regions.

Specimens examined: República Dominicana, San Cristóbal Province, "on Santiago road, 30 miles (48 km) N Santo Domingo" (= vicinity of Villa Altagracia), 6 (AMNH 49886-91); 4.2 mi. (6.8 km) NE Sabana Grande de Palenque, 3 (ASFS X8138-40); *Distrito Nacional*, 5 km SW Madrigal, 2 (MCZ 58083-84); mouth of Río Jaina, 1 (UIMNH 44700 - paratype); Santo Domingo, 3 (MCZ 53919 - paratype of *L. p. lunatus*, MCZ 57984, MCZ 58082); Santo Domingo, 2.2 km SW Río Ozama, 1 (ASFS X7734); Santo Domingo, old airport, 12 (ASFS X9243-53, RT 703). *L. p. subsp.: San Cristóbal Province,* San Cristóbal, 1 (MCZ 75138); *San Pedro de Macorís Province,* San Pedro de Macorís, 1 (AMNH 7556); *La Romana Province,* Río Cumayasa, 17 km W La Romana, 2 (ASFS X8231-32).

Leiocephalus personatus mentalis Cochran, 1932

Leiocephalus personatus mentalis Cochran 1932, Proc. Biol. Soc. Washington, 45:178.
Type locality: Jovero, El Seibo Province, República Dominicana.
Holotype: USNM 65772, an adult male with

a snout-vent length of 64 mm (*fide* Cochran, 1941:228).

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of bright yellow and completely immaculate throat, mental scale dark brown, dark brown face mask extremely bold and prominent against brown to tan dorsal and head coloration (Fig. 4b), dorsolateral lines tan and fairly prominent to absent depending on the shade of dorsal coloration, no nuchal or scapular transverse bars but median crest scales tipped with dark brown to black on the neck and shoulders giving a median series of dark dots; size small (males to 72 mm, females to 58 mm snout-vent length), low number of loreals (4.0), median head shields modally 5, frontoparietals modally 5.

Distribution: República Dominicana, from the type locality eastward to Juanillo (Fig. 3) south of Cabo Engaño (see, however, the discussion of the following subspecies).

Variation and discussion: The series of 36 *L. p. mentalis* has the following scale counts: dorsal crest scales occiput-vent 44 - 54 (mean 50.0), dorsal crest scales occiput-axilla 14 - 22 (mean 17.9), dorsal crest scales on trunk 22 - 37 (mean 32.7), one half midbody scales 19 - 26 (mean 22.2), subdigital fourth toe tricarinate scales 21 - 27 (mean 24.0), loreals 2 - 8 (mean 4.0), temporals 8 - 12 (mean 9.9), supraoculars 6/6 (32 specimens), 5/6 (5), 6/7 (5), 7/7 (2), 7/8 (1), 10/11 (1), semicircles usually complete (69.6 percent), and parietals almost always in contact (95.6 percent). The prefrontal row consists of 2 to 4 (mode 3) scales, the median head shields vary between 4 and 6 (mode 4) scales, and the frontoparietal row has 3 to 6 scales (mode 5); the prefrontal row is almost always complete (45 of 47 specimens) and the frontoparietal row is usually complete (38 of 46 specimens). The largest male has a snout-vent length of 76 mm, the largest female 58 mm; the male is from "Península de Samaná" and the female is a topotype.

L. personatus is presently represented by fairly adequate material from the northern portion of the República Dominicana, from Juanillo in the extreme east to Monte Cristi in the northwest. Cochran (1941:231) assigned specimens from Jovero and Guarabo on the east to Puerto Plata and Sosúa in the north to *mentalis*. In actuality, the specimens from the extreme eastern portion of this area are quite distinct from lizards to the north and west—one of the major differences being the smudged throats of the more northern lizards. I have seen four male topotypes of *mentalis*, and of them only one, a large adult with a snout-vent maculate throat, a character which I consider diagnostic of *mentalis*. Three have a distinct dark brown mask, and this feature is obsolete in the fourth. The dorsa are in general pale at present. I consider the population at Jovero to be somewhat intermediate between *mentalis* and the race next to the west, but the available material indicates that the topotypical population is closer to the lizards to the east than to the west. Accordingly, I employ the name *mentalis* for the more eastern lizards.

Two males from El Macao were described in life as follows. The dorsal ground color is light brown to tan with tan dorsolateral lines. The sides are tan with scattered brick scales. The mask is dark brown and extremely prominent and sharp-edged, bordered below by a bright yellow supralabial line. The head scales are brown with some scattered dark brown punctations, and some of the median crest scales on the neck and shoulders are dark brown, giving a median dorsal row of dark dots. The throats are immaculate bright yellow. The ventral ground color is pale yellow and there are brick lines extending onto the venter along its posterior sides. The sides of the tail are brown with some brick scales, and the underside of the tail is tan and creamy, not orange. The tail is brown above and lacks chevrons. The hindlimbs are dull brownish-green above.

The females from El Macao are tan to brown dorsally with prominent pale buffy dorsolateral lines. The lateral lines between the limbs are dull buffy and not especially prominent. The median zone has a series of about six complete or incomplete chevrons anterior to the hindlimbs. The ventral ground color is white, with heavy black throat spotting and dark gray belly dotting.

The above descriptions agree in pattern length of 70 mm, has a completely im-

details with specimens from Juanillo, although females from that locality have the throat spots somewhat more reduced than more northern specimens. Males from Juanillo have the head scales irregularly suffused with very dark brown and tan, giving a peculiarly frosted appearance; the same condition occurs in males from El Macao, but not to so conspicuous a degree. Young males from all localities as usual resemble females in having darkly spotted throats and venters.

L. p. mentalis surely is one of the most easily recognized subspecies of *L. personatus*. It stands directly opposed to *L. p. personatus* in throat coloration, the latter having a solid black throat, and *mentalis* having a completely immaculate yellow throat. Although the throat of *trujilloensis* is not so extensively dark as that of *personatus*, the dark throat of the former also distinguishes it from *mentalis*. The yellow throat of *mentalis* and the yellow supralabial line make the dark brown mask in this subspecies very bold and distinct in comparison to the almost obliterated masks of *personatus* and *trujilloensis*. The brown-tipped mental scale in *mentalis* is likewise diagnostic; this brown pigment is placed in bold contrast to the otherwise yellow throat. The pale yellow ventral coloration of *mentalis* contrasts with the shades of green of the venters of *personatus* and *trujilloensis*, *mentalis* being the only subspecies of *L. personatus* with a yellow belly.

L. p. mentalis occurs in more or less coastal localities in extreme northeastern Hispaniola (but see the discussion of the following subspecies). Although I have visited Jovero on several occasions I have never seen the lizard there. Our single series was obtained in a sandy coconut grove immediately adjacent to the beach near El Macao. The lizards were extremely abundant at this locality, but were not in evidence until about 1430 hours, after the heat of the day was past. They became increasingly evident as the afternoon cooled.

Specimens examined: República Dominicana, El Seibo Province, Jovero, 10 (USNM 65770-71, 65775-79, 66708-09, 66712,—paratypes); Guarabo, 2 (USNM 66710-11—paratypes); *La Romana Province,* 0.9 mi. (1.4 km) SE El Macao, 20 (ASFS V887-906); Juanillo, 14 (MCZ 75124-37); *?Samaná Province,* "Península de Samaná" (not mapped), 1 (USNM 66764—paratype); "Samaná and Laguna" (not mapped), 1 (USNM 65774—paratype); see discussion of following subspecies for comments on these two specimens.
(USNM 65774—paratype); see discussion of following subspecies for comments on these two specimens).

Leiocephalus personatus **tarachodes,** new subspecies

Holotype: MCZ 81087, an adult male, from 6 km SE Nagua, María Trinidad Sánchez Province, República Dominicana, one of a series collected 26 October 1963 by Albert Schwartz and Richard Thomas. Original number V1804.

Paratypes: ASFS V1802-03, V1805-06, V1813-16, UIMNH 61616-19, UF 21325-27, CM 40564-65, RT 837-38, same data as holotype.

Associated specimens: República Dominicana, Samaná Province, Samaná, 4 (AMNH 63105-08); Chico Puerto Francés (not mapped), 1 (AMNH 42314); *El Seibo Province,* Sabana de la Mar, 52 (MCZ 57139-43, 58052-58, 58060-63, SMF 26033-47, 26288, AMNH 50047, 50049-56, 50060-61, 50063-67, 50125); 0.5 mi. (0.8 km) S Sabana de la Mar, 2 (MCZ 57144, AMNH 41988); 15 km S Sabana de la Mar, 1 (MCZ 58064); Hato Mayor, 2 (AMNH 49804-05).

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of green or gray throat with two rather bold transverse lines composed of black smudges at the level of the fourth and sixth chin shields (Fig. 5c), bright green ventral color, mask present but not especially conspicuous because of dark brown head coloration, bordered below by two or three bright yellow to cream subocular and temporal spots, dorsal ground color tan with transverse nuchal and scapular bars rarely present and usually reduced to a series of black median dots on the dorsal crest scales; size moderate (males to 75 mm, females to 63 mm snout-vent length), low number of loreals (3.8), median head shields modally 4, frontoparietals modally 4, and supraorbital semicircles more often incomplete (63.2 percent) than complete.

Distribution: República Dominicana, from the vicinity of Nagua southeastward to Sabana de la Mar and Hato Mayor, west to near Moca and Salcedo, and presumed to include the Península de Samaná (but see discussion) (Fig. 3).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 75 mm, tail broken; dorsal crest scales occiput-vent 48, dorsal crest scales occiput-axilla 21, dorsal crest scales on trunk 27, one half midbody scales 22, subdigital fourth toe tricarinate scales 21/22, loreals 4, temporals 11, enlarged auriculars 4/3; 3 prefrontal scales, row complete; 4 median head shields; 5 frontoparietal scales, row complete; 5/5 supraocular scales; supraorbital semicircles incomplete; parietal scales in contact.

Dorsal ground color tan, each scale with a golden fleck; dorsolateral pale longitudinal lines absent; sides tan with some brick scales admixed. Mask dark brown, involving the loreal and temporal regions, not especially conspicuous because of brown dorsal cephalic coloration; three yellow spots below mask, two on supralabials and one on temporals. Three transverse nuchal and scapular bars indicated but not prominent. Top of head brown with a series of dark brown dots outlining the median curve of the supraoculars and a single spot on the snout; a series of pale dots more mediad to the dark dots outlining the supraoculars, thus giving a double series of dark and light dots in this region. Upper surface of hindlimbs green, of forelimbs tan. Throat green, chin yellowish, with two transverse black bars across the throat at the levels of the fourth and sixth chin shields, followed by a series of both pale (yellow-green) and dark scales rather randomly smudging the balance of the throat. Ventral ground color bright green. Tail brown above, rather indistinctly chevronate basally and more prominently distally.

Variation: The series of 58 specimens of *L. p. tarachodes* has the following scale counts: dorsal crest scales occiput-vent 44 - 57 (mean 49.8), dorsal crest scales occiput-axilla 14 - 23 (mean 17.9), dorsal crest scales on trunk 23 - 38 (mean 31.2), one half midbody scales 18 - 24 (mean 20.9), subdigital fourth toe tricarinate scales 18 - 25 (mean 20.8), loreals 2 - 6 (mean 3.9), temporals 8 - 14 (mean 9.8), supraoculars 6/6 (36 specimens), 4/5 (1), 4/6 (1), 5/5 (18), 5/6 (19), 6/7 (1), semicircles more often incomplete (63.2 percent), and parietals usually in contact (98.7 percent). The prefrontal row consists of either 3 or 4 scales (mode 3), the median head shields vary between 4 and 6 (mode 4), and the frontoparietal row has 2 to 5 scales (mode 4); the prefrontal row is almost always complete (76 of 77 specimens) and the frontoparietal row is more often complete than not (65 of 78 specimens). The largest males have snout-vent lengths of 75 mm and are topotypes, and the largest female measures 63 mm and is from Sabana de la Mar.

The series of topoparatypes was described in life as follows. Males have the dorsal ground color tan, at times flecked with golden (the type is in this latter condition). The pale dorsolateral lines may be either present or absent, the latter situation being typical of fully adult individuals. The sides are usually tan with brick and green scales admixed, but at times there is no green (even in large adults like the type) and very little brick. The mask is dark brown and has two or three cream to yellow spots along its lower border. The ventral ground color is always bright green, and the throats are green to gray, the brighter color in full adults. There are usually one or two transverse bands across the throat, at the levels of the fourth and sixth chin shields, but in some (not necessarily small) males these may be somewhat reduced (UF 21326, SMF 26033) or even almost completely absent (ASFS V1803, SMF 26036). In a male from Sabana de la Mar (MCZ 58063) the chin is heavily dotted with dark brown and only the anteriormost band is indicated, with additional heavy pigment anterior to it. There may be a few bright yellow scales on the lower jaw near the angle of the mouth.

Females are dark brown dorsally, with tan dorsolateral lines more or less distinct. Many larger females lack any obvious chevronate pattern and the dorsal zone may be flecked with tan. Other females show about eight dorsal chevrons before the hindlimbs. The ventral ground color is pale green as are also the throats, and there is exception-

ally heavy black throat dotting, the dots at times coalescing into short bars or dashes. The venters are dotted with dark gray, often to the ventral midline.

Juvenile males resemble females in dorsal and ventral patterns, but have the belly spotting somewhat less obvious than do young females.

Comparisons: Male *L. p. tarachodes* may be differentiated from *mentalis* in having a green (instead of yellow) throat and venter, in having a patterned (rather than immaculate) throat, and in having a less conspicuous mask and dark mental scale. From both *personatus* and *trujilloensis, tarachodes* differs in having the throat less heavily pigmented, and in having the throat crossed by two bars rather than being more or less solidly dark. *L. p. tarachodes* reaches a slightly larger size than *mentalis* and is slightly smaller than *personatus.* The modal head scalation formula (prefrontals-median shields-frontoparietals) in *tarachodes* is 3-4-4; the formulae for the other three races are 3-5-4 *(personatus)* and 3-4-5 *(trujilloensis* and *mentalis).* An interesting similarity between *tarachodes* and *trujilloensis* is that both have high frequencies of 5/5 supraoculars, although this category is relatively more frequent in *trujilloensis* than in *tarachodes.* It occurs but rarely in *personatus* and *mentalis. L. p. tarachodes* is the only subspecies of *L. personatus* which has the supraorbital semicircles more often incomplete.

Remarks: The precise situation on the Península de Samaná as far as the races *tarachodes* and *mentalis* are concerned is unknown. There are only seven specimens available from the Samaná; of these, four are adult males and easily distinguishable as to subspecies. Two of the males (AMNH 63105-06), although much desiccated and discolored, clearly show the throat smudging of *tarachodes.* The other two males (USNM 65774 and USNM 66764—both paratypes of *mentalis*) are just as clearly *mentalis.* It is possible that *mentalis* occurs on the Samaná, but such a possibility seems remote, especially since the base of the Samaná is bracketed by *tarachodes* (Nagua and Sabana de la Mar). The Samaná *mentalis* may have been fortuitously introduced near the tip of the Samaná, or *mentalis* may have reached that peninsula from the mainland across the Bahía de Samaná. Probably the most likely explanation is that these two lizards were originally mislabeled as to locality. Both were collected by W. L. Abbott on his last trip to the República Dominicana in 1923; one specimen has no date other than the year and the other specimen was collected in March. Abbott made two trips to the República Dominicana in 1923 (Wetmore and Swales, 1931:30-31); on the earlier trip (February and March) he collected south of the Bahía de Samaná at Jovero (where he took the holotype of *mentalis*), El Liar and Las Cañitas. In early March he crossed to the city of Samaná and later collected at Sánchez at the base of the peninsula. On his second 1923 visit (November and December) Abbott collected twice at Sánchez and Samaná, and spent the balance of the time on the south side of the Bahía de Samaná. Conceivably the two "Samaná" specimens of *mentalis* originated south of the Bahía de Samaná during one of Abbott's visits to that area, and did not come from the Península. Additional material from the Samaná should confirm the presence or absence of *mentalis* on the peninsula.

The range of *L. p. tarachodes* embraces much of the very mesic northeastern portion of the República Dominicana. To the east, *tarachodes* approaches *mentalis* closely (Hato Mayor and Jovero), and, as has already been pointed out, specimens from Jovero (the type locality of *mentalis*) show some genetic influence of *tarachodes.* Apparently the Cordillera Oriental does not act as a barrier for *tarachodes,* since the two specimens from Hato Mayor are from the south side of that mountain range. These two specimens are both juveniles and in rather bad condition; possibly they are in actuality related to the southern coastal form discussed under *L. p. trujilloensis.*

In the west, *L. p. tarachodes* intergrades with *L. p. scalaris.* A series of eight lizards from Moca, Espaillat Province (SMF 25955, 26118-23, 26318) and a single female from 3 km NW Salcedo, Salcedo Province (ASFS V2941), are clearly *tarachodes* in coloration and pattern. Of the nine specimens, four have the supraorbital semicircles incomplete. The high dorsal crest scale counts of 50 to 61 are closer to the crest counts for

scalaris (44-63) than *tarachodes* (44-57). I consider these lizards as being intermediate between *tarachodes* and *scalaris,* but much closer to the former.

Much of the range of *L. p. tarachodes* lies within that region of the República Dominicana which has the heaviest rainfall (mean annual precipitation of 2000 mm to 2500 mm or above) in the republic. The rather sharp break in precipitation (and a concommitant change in vegetation) in the region between San Francisco de Macorís and Santiago corresponds in general to the dividing line between the subspecies *tarachodes* and *scalaris.*

The type series from near Nagua was taken along beach dunes and among sea-edge driftwood. Very few lizards were seen in an immediately adjacent and sandy *Cocos* grove, although they were extremely abundant along the beach itself. The series from Moca was taken (Mertens, *op. cit.*:50) in pineapple fields, where the lizards were numerous.

Leiocephalus personatus **actites,** new subspecies

Holotype: MCZ 81088, an adult male, from Sosúa, Puerto Plata Province, República Dominicana, one of a series collected 15 October 1963 by Albert Schwartz and Richard Thomas. Original number V1636.

Paratypes: ASFS V1633-35, V1637, V1646-48, UF 21338-42, UIMNH 61637-40, KU 93333-36, RT 829-30, same data as type; MCZ 13679-91, same locality as type, J. L. Peters, 1916; MCZ 43671-75, same locality as type, W. J. Clench, 1937; MCZ 5443 (2 specimens), Puerto Plata, Puerto Plata Province, República Dominicana, M. A. Frazar, no date; AMNH 40364-66, Puerto Plata, Puerto Plata Province, República Dominicana, 27 September 1929, W. G. Hassler; AMNH 44846-51, Puerto Plata, Puerto Plata Province, República Dominicana, 1 August 1922, G. K. Noble; ASFS V1671, 10 km NW Sabaneta de Yásica, Puerto Plata Province, República Dominicana, 16 October 1963, R. Thomas; USNM 156731-37, USNM 156750, 9 km N Villa Isabela, Puerto Plata Province, República Dominicana, 14 September 1963, A. Schwartz, R. Thomas.

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of pale green throat with usually a pair of transverse black lines at the level of the second and third chin shields (Fig. 5d), pale greenish ventral color, mask present but somewhat faded in older adults with a pair of vertical broad subocular creamy to yellow-orange bars which may in turn be partly or wholly confluent with a horizontal pale temporal bar and its postauricular mate, dorsal ground color from grayish-tan and sandy to practically black, dorsolateral longitudinal lines fairly prominent and bordered medially by a broad ill-defined darker area of the dorsal zone, nuchal and scapular transverse bars absent in adults and only at times indicated by a series of darker (dull brown, rather than dark brown or black) median crest scales; size very large (males to 86 mm, females to 61 mm snout-vent length), moderate number of loreals (4.3), median head shields modally 4, frontoparietals modally 4, and supraorbital semicircles more often complete (58.9 percent).

Distribution: The northern coast of the República Dominicana in Puerto Plata Province, from near Villa Isabela in the west to near Sabaneta de Yásica in the east (Fig. 3).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 76 mm, tail 79 mm, distal half regenerated; dorsal crest scales occiput-vent 48, dorsal crest scales occiput-axilla 17, dorsal crest scales on trunk 31, one half midbody scales 22, subdigital fourth toe tricarinate scales 22/22, loreals 5, temporals 9, enlarged auriculars 3/3; 3 prefrontal scales, row complete; 5 median head shields; 4 frontoparietal scales, row complete; 6/6 supraoculars; supraorbital semicircles complete; parietal scales in contact.

Ground color of dorsal zone tan, somewhat darker laterally, leaving a middorsal longitudinal paler band, the whole back with creamy flecks; dorsolateral longitudinal lines pale sandy and fairly conspicuous; about five darker brown dots on the crest scales in the nuchal and scapular regions; sides deep reddish-orange with some green scales admixed; lateral line between limbs whitish, conspicuous. Top of head brown,

suffused with darker brown and some paler brown, and with a cream line from the canthus over the outer margin of the supraoculars onto the upper temporal region; mask fairly conspicuous, outlined below by a pair of creamy vertical subocular bars and a more diffuse creamy lower temporal region. Upper surface of hindlimbs green, heavily flecked with yellow green; upper surface of forelimbs tan. Throat pale greenish with a prominent transverse bar at the level of the first chin shield and a second bar indicated at the level of the third and fourth chin shield, the latter bar fragmented; remainder of throat with diffuse and scattered dusky smudges. Ventral ground color greenish. Tail brown above with no chevrons.

Variation: The series of 42 specimens of *L. p. actites* has the following scale counts: dorsal crest scales occiput-vent 43 - 58 (mean 50.3), dorsal crest scale occiput-axilla 16 - 21 (mean 18.7), dorsal crest scales on trunk 23 - 39 (mean 31.4), one half midbody scales 21 - 26 (mean 22.6), subdigital fourth toe tricarinate scales 19 - 25 (mean 22.3), loreals 3 - 7 (mean 4.3), temporals 8 - 11 (mean 9.2), supraoculars 6/6 (44 specimens), 5/6 (4), 6/7 (1), semicircles more often complete (58.9 percent), and parietals always in contact (100 percent). The prefrontal row consists of either 3 or 4 scales (mode 3), the median head shields vary between 3 and 6 (mode 4), and the frontoparietal row has 2 to 5 scales (mode 4); the prefrontal row is always complete (56 specimens) and the frontoparietal row is more often complete (50 of 56 specimens). The largest male has a snout-vent length of 86 mm, the largest female 61 mm; both specimens are topotypes.

The series of living *L. p. actites* from Sosúa and Villa Isabela were described as follows. Males have the dorsal ground color brown, sandy, grayish-tan or even black, overlaid with creamy flecks. The dorsolateral lines are buffy and usually readily discernible, especially because of a darker dusky suffusion along their median edges. Adult males lack nuchal and scapular transverse bars and may have dark dots on the anterior crest in this region, but the dots are usually not prominent and may be absent completely. The sides are grayish-tan to sandy with some brick and creamy flecking and without any green lateral dotting; old adults have no red or cream on the sides, which are colored entirely of dusty tans and browns. The mask is variable in extent, and may be bold and prominent and outlined below by the vertical yellow-orange to cream subocular bars, a horizontal bar and a postauricular bar of the same color, or it may be hollowed centrally (Villa Isabela), forming a black-edged tan rectangle. The head is brown, suffused both with paler and darker browns, and there is often a cream canthal-supraocular-temporal line which borders the mask above and renders it more prominent. The ventral ground color is green, usually pale or grayish-green, and the throat is the same shade; there is no yellow on the chin or throat. There are usually two transverse throat bars at the level of the second and third or fourth chin shields. These bars are somewhat variable, but the first is almost always present and the second at least indicated. At times (ASFS V1634) the throat appears to be almost immaculate except for some vague lateral dusky smudges at the level of the second transverse bar. The hindlimbs are dull green with much yellow-green or paler green flecking.

Females are tan to brownish dorsally with usually about four complete and broad chevrons anterior to the hindlimbs; the remainder of the chevrons (alternating between the dark and prominent ones) are suppressed and indistinct. The buffy dorsolateral and lateral lines are bold and prominent. The sides are often dark brown and strongly contrasting with the pale lines both above and below, and are marked with short diagonal darker brown dashes. The ventral ground color is pale green to opalescent, and the throats are whitish-green. The throats are heavily dotted with black to dark gray, and the anterior dots often are aligned to form the two transverse bars which are characteristic of the males. The venter is dotted with dark gray laterally, but is usually more or less clear centrally.

Juvenile males resemble females in coloration and pattern, and have the same reduction of dorsal chevrons which characterizes females.

Comparisons: L. p. actites can be dif-

ferentiated from *L. p. mentalis* by having a green rather than yellow venter and having the mask less prominent. From *personatus* and *trujilloensis, actites* differs in lacking a black or heavily patterned throat and face. Both geographically and in characteristics, *actites* is closest to *tarachodes;* these two subspecies form part of a complex of three similar races from northern Hispaniola. *L. p. actites* differs from *tarachodes* in the position of the transverse throat bars (on the first and third or fourth chin shields in *actites,* on the fourth and sixth in *tarachodes*), and in having these bars much more bold in *tarachodes* than in *actites.* The lack of green on the sides of *actites* and the creamy (versus golden) dorsal flecks are additional chromatic features which distinguish the two races. In size, *actites* is larger than all other subspecies of *L. personatus.*

In having a head scalation formula of 3-4-4, *actites* is like *tarachodes,* but differs from the other subspecies which have formulae of 3-5-4 and 3-4-5. The high incidence of incomplete semicircles in *tarachodes* differentiates that race from *actites* which has the semicircles more often complete. *Tarachodes* has a high frequency of 5/5 supraoculars (as does also *trujilloensis*); this category has not been observed in *actites.*

Remarks: The distribution of *L. p. actites* as currently known is restricted to the coastline of a single province in northern República Dominicana; the distance between the known extreme localities of *actites* is about 80 kilometers. Between the easternmost locality for *actites* (Sabaneta de Yásica) and the westernmost record for *tarachodes* (Nagua) is about 65 kilometers. Although Thomas, Buden, and I have collected several times in the intervening area, we have not encountered *Leiocephalus* in this intermediate region.

The range of *L. p. actites* is separated from the race to the south by the Cordillera Septentrional which lies between the north coast and the Valle de Cibao. *L. personatus* is not known from this mountain range which reaches a maximum elevation of 1249 meters (Pico Diego de Ocampo) between Santiago and Puerto Plata.

The specimens from Villa Isabela were collected on a low rocky bluff immediately adjacent to extensive mangrove flats, whereas those from Sosúa were taken along an open beach and about deserted bath houses where the lizards were exceptionally abundant. Here they sought sanctuary from the heat in copses of *Coccoloba* and in the shade of sandy overhangs at the rear of the beach. The specimen from near Sabaneta de Yásica was collected along the roadside in *Psidium* scrub.

Leiocephalus personatus scalaris Cochran, 1932

Leiocephalus personatus scalaris Cochran, 1932, Proc. Biol. Soc. Washington, 45: 181.

Leiocephalus personatus pulcherrimus Mertens, 1939, Abh. Senckenberg. Naturf. Ges., 449:50 (type locality—2 km S Monción, 450 meters, Santiago Rodríguez Province, República Dominicana; holotype - SMF 25757, an adult male with a snout-vent length of 56 mm, *fide* Mertens, *op. cit.*: 51).

Type locality: Cap-Haïtien, Dépt. du Nord, Haiti.

Holotype: USNM 74054, an adult male with a snout-vent length of 75 mm (*fide* Cochran, 1941:226).

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of green to yellow-green venter and throat, the latter almost immaculate or with only a few dusky smudges usually not aligned into any discernible transverse bars, dorsal ground color varying from tan to dark brown, often flecked or mottled with yellow, cream or brick even in small individuals, dorsolateral line faint in adults, mask prominent and outlined above by an orange canthal-supraocular-temporal line and below by two or three orange vertical subocular bars, which at times are continuous with an orange bar across the lower temporal region, nuchal and scapular bars faint or usually absent, their positions indicated by dark brown crest scale dots; size large (males to 82 mm, females to 63 mm snout-vent length), low number of loreals (3.9), median head shields modally 4, frontoparietals modally 5.

Distribution: From the vicinity of Cap-Haïtien on the north coast of Haiti, and St. Michel de l'Atalaye, eastward along the coast to Monte Cristi; thence inland in the

Valle de Cibao as far east as the vicinity of Santiago along the Dominico-Haitian border and as far south as Cerca-la-Source in Haiti and Bánica in the República Dominicana; Isla Monte Chico in the Siete Hermanos Islands and Isla Cabras off Monte Cristi (Fig. 3).

Variation and discussion: The series of 131 *L. p. scalaris* has the following scale counts: dorsal crest scales occiput-vent 44-63 (mean 53.3), dorsal crest scales occiput-axilla 14-24 (mean 19.6), dorsal crest scales on trunk 24-44 (mean 33.7), one half midbody scales 19-28 (mean 23.3), subdigital fourth toe tricarinate scales 18-26 (mean 22.1), loreals 2-7 (mean 3.9), temporals 7-13 (mean 9.8), supraoculars 6/6 (166 specimens), 5/5 (9), 5/6 (11), 6/7 (15), 7/7 (4), 8/8 (2), semicircles usually complete (82.0 percent), and parietals almost always in contact (97.1 percent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 2 and 7 (mode 4), and the frontoparietal row has 1 to 7 scales (mode 5); the prefrontal row is almost always complete (212 of 213 specimens) and the frontoparietal row is usually complete (172 of 204 specimens). The largest male measures 82 mm in snout-vent length, and the largest female 63 mm; both are from Ti Guinin near Cap-Haïtien.

I reluctantly consider *L. p. pulcherrimus* Mertens a junior synonym of *L. p. scalaris* Cochran. I have seen no live specimens from northern Haiti, but I have collected extensively in the Valle de Cibao region in the northern República Dominicana. This latter area is inhabited by *"pulcherrimus"*; although the type locality of *pulcherrimus* is in the lower northern foothills of the Cordillera Central, the thirteen topoparatypes I have examined are indistinguishable from Cibao specimens; additionally Mertens assigned a specimen from Cayo Pablito (= Isla Cabras) to *pulcherrimus*. This islet lies off the coast at Monte Cristi. The intervening mainland area between Monte Cristi and Monción is inhabited by lizards with the same style of coloration and pattern as the specimen from Monción. Specimens from localities in Santiago Rodríguez Province other than Monción (19 km SE Martín García, 3 km S Los Quemados) are identical with specimens from the Cibao as well. It thus seems certain that all specimens from the Valle de Cibao are identical and belong to *"pulcherrimus"*.

The long and well preserved series of near topotypic *L. p. scalaris* in the Museum of Comparative Zoology appears indistinguishable to me in pattern and residual coloration from *"pulcherrimus."* The scale counts of a series of 94 *"pulcherrimus"* and 38 *scalaris* are virtually identical (both in extremes and means) as well. The only difference between the two lots is the larger adult size in both sexes (although more pronounced in the males) in *scalaris;* male *scalaris* reach a maximum snout-vent length of 82 mm and females 63 mm, whereas male *"pulcherrimus"* reach only a snout-vent length of 74 mm and females 60 mm. The difference in size is rather striking when the two series are compared, but no other character will distinguish the two. I therefore consider *pulcherrimus* Mertens a synonym of *scalaris* Cochran.

Color and pattern notes on series from the Valle de Cibao show the following features. Males have the dorsal ground color varying from tan to dark brown, often flecked or mottled with yellow or brick even in subadult specimens. The creamy to sandy dorsolateral lines are faint in full adults but more prominent in subadults. In some adults the dorsal zone is darker laterally, thus effectively reinforcing the appearance of the dorsolateral lines. The sides are brick with admixed green to turquoise scales, and occasionally with some cream scales as well—resulting in a very handsome lizard. The heads are tan to brown with orange to yellow or cream markings including a pair of subocular vertical bars or spots, followed by, or confluent with, a similarly colored pale rectangle across the lower temporal region. There is often an orange to yellow canthal-supraocular-temporal line which intensifies the dark brown mask above, as the mask is delimited by the orange temporal rectangle below. The transverse nuchal and scapular bars are obscure or absent in adults, their places being marked by a series of dark brown dots on the dorsal crest scales. Specimens from Haiti tend to have a series of three nuchal and scapular bars still visible in full adults, but this is not exclusively diagnostic of the Haitian popula-

tions. The hindlimbs are dark green, flecked with yellow-green and the forelimbs are tan. The ventral coloration varies from green, especially the underside of the hindlimbs which is often blue-green, to a paler yellow-green. The throat is greenish, often with a yellow suffusion, and usually dusky without any clearly defined bars. There may also be some scattered dusky smudges, which are most prominent along the sides of the throat. The mental scale may be all or partly dark brown or black, or it may not be darkly pigmented at all. The sides of the tail are brick and the upper side of the tail is brown, rather weakly chevronate in full adults.

Females are tan to dark brown above with the dorsolateral lines buffy to cream and yellow and with four dark brown to black chevrons anterior to the hindlimbs. The lateral lines are white or yellow and very bold in most specimens, and the sides are tan to dark brown, usually showing darker brown longitudinal dashes within the fields. The venter is very pale greenish-white or opalescent and the throats are white to gray with heavy discrete black spots with some tendency to form transverse dark bars anteriorly behind the chin. The venter is marked with pale to dark gray dots or longitudinal dashes, usually most prominent laterally.

Juvenile males are indistinguishable from young females; at least in Dominican specimens the adult male dusky or faintly smudged throat appears in males with snout-vent lengths of only 45 mm.

L. p. scalaris is closest in characteristics to *L. p. actites* and *L. p. tarachodes*. From the races *personatus, trujilloensis* and *mentalis, scalaris* differs in having a green venter (rather than yellow in *mentalis*), and in lacking the extensive throat and head black pigmentation of *personatus* and *trujilloensis*. The mask is much more prominent in *mentalis* than it is in *scalaris*. From both *actites* and *tarachodes, scalaris* may be differentiated in lacking any clearly defined throat bars (although the throats of some *actites* resemble closely the throats of some *scalaris*), and in being larger than *tarachodes* and smaller than *actites*. The dorsal and ventral coloration of all three races is quite similar.

Scalewise, *scalaris* with a modal head scale formula of 3-4-5 differs from *tarachodes* and *actites*, both of which have formulae of 3-4-4, and resembles *trujilloensis* and *mentalis*, both of which have formulae of 3-4-5. The race *personatus* is distinct with a formula of 3-5-4. *Tarachodes* also differs from *scalaris* in having the semicircles more often incomplete than complete.

The distribution of *L. p. scalaris* encompasses in part the dry and hot north-central regions of Hispaniola, in the Valle de Cibao. In this region, specimens were taken in well shaded cactus woods, in *Opuntia* thickets, along the open hot shore of a mangrove lagoon, along the open borders of a sisal field, in xeric *Acacia* woods, and in shady *Euphorbia* woods near the coast. The subspecies is not restricted to such bleak habitats, however, and reaches an elevation of 800 meters. In more mesic situations, *scalaris* was encountered along a rocky road-cut in pine woods (Santiago de la Cruz), in a *cafetal* on the southern slopes of the Cordillera Septentrional (La Cruz de Guayacanes), along a rocky stream bordered by deciduous woods (Martín García), and in a roadside ditch adjacent to a grassy field (Loma de Cabrera). Mertens (*op. cit.*:51) collected the type series of *pulcherrimus* in open pine woods. From the above, it can be seen that in the República Dominicana, *scalaris* occupies a variety of habitats and occurs at moderate elevations. The specimens from Bánica may well have come from still higher, but rather less mesic, situations.

The Haitian range of *scalaris* seems to be the northern coast from Cap-Haïtien eastwards, and inland to St. Michel de l'Atalaye and Cerca-la-Source. Too few specimens are available from these more interior localities (three from Cerca-la-Source, one from St. Michel) to say with complete assurance that this region is inhabited by *scalaris*. What specimens are available (including three adult males) do indicate that at least the lizards in this region are related closely to (if not identical with) *scalaris*. The single specimen from Isla Monte Chico in the Siete Hermanos group is presently not distinguishable from *scalaris*. It is interesting that Richard Thomas visited the islets of Ratas, Torurú, and Muertos without finding *L. personatus* on any of them.

L. p. scalaris is separated from *actites* by the Cordillera Septentrional, and intergrades with *tarachodes* to the east of Santiago (see discussion under *L. p. tarachodes*). The relationships of *scalaris* with the race to the south in the Cordillera Central will be discussed below.

Specimens examined: Haiti, Dépt. du Nord, Cap-Haïtien, 8 (MCZ 46918-19 - paratypes, 63251-52, 63253-56); Ti Guinin, near Cap-Haïtien (not mapped), 74 (MCZ 66710-83); Citadelle Laferrière, 1 (MCZ 66809); Grande Rivière du Nord, 26 (MCZ 63250, 66784-808); Caracol, 2 (USNM 72636-37); Fort Liberté, 6 (USNM 76764-69); Cerca - la - Source, 3 (USNM 76777-79); *Dépt. de l'Artibonite,* St. Michel de l'Atalaye, 1 (USNM 76651); *República Dominicana, Monte Cristi Province,* 4 km E Pepillo Salcedo, 4 (ASFS V1156, V1163-65); 5 km SE Pepillo Salcedo, 3 (ASFS V1454-55, V1461); 1 km SE Pepillo Salcedo, 1 (ASFS V1456); 10 km N Copey, 1 (ASFS V1161); Monte Cristi, 2 (MCZ 43823-24); 3 km NE Monte Cristi, 5 (ASFS V1270-74); 2 km SE Monte Cristi, 29 (ASFS V1182-202, V1260-65, RT 809-10); 4 km E Los Conucos, 1 (ASFS V1348); 3 km E Los Conucos, 7 (ASFS V1515-21); 9 km NW Villa Vásquez, 2 (ASFS V1226-27); 7 km N Guayubín, 2 (ASFS V1492-93); 5 km W Guayubín, 4 (ASFS V1509-10, ASFS V1607-08); Isla Monte Chico, Siete Hermanos, 1 (USNM 76714); *Dajabón Province,* 1 km S Loma de Cabrera, 900 feet (295 meters), 1 (ASFS V1468); 3 km E Santiago de la Cruz, 750 feet (246 meters), 3 (ASFS V1242-44); *San Rafael Province,* Bánica, 2 (MCZ 58066-67); 3 km E Bánica, 1 (MCZ 58065); *Valverde Province,* 7 km NW La Cruz de Guayacanes, 1 (ASFS V1236); 2 km N Esperanza, 9 (ASFS V1746-54); *Santiago Rodríguez Province,* 19 km SE Martín García, 600 feet (197 meters), 8 (ASFS V1245-52); 2 km S Monción, 450 meters, 1 (UIMNH 44699, SMF 25748-56, 25782-84 — paratypes of *pulcherrimus*); 3 km S Los Quemados, 1 (ASFS V1767); *Santiago Province,* Santiago, 11 (MCZ 58039-43, 58045-50); 7 km W Santiago, 1 (ASFS V2928); Licey al Medio, 2 (MCZ 58321-22).

Leiocephalus personatus **budeni,** new subspecies

Holotype: MCZ 81089, an adult male, from 12 km NE Jarabacoa, 2000 feet (656 meters), La Vega Province, República Dominicana, one of a series collected 27 November 1964 by Donald W. Buden and native collector. Original number V4223.

Paratypes: ASFS V4224-35, same data as holotype; CM 40566-69, same locality as holotype, 30 November 1964, native collector; USNM 156738-40, same locality as holotype, 30 November 1964, D. W. Buden, R. Thomas; UIMNH 61620-23, same locality as holotype, 2 December 1964, native collector; KU 93316-21, same locality as holotype, 3 November 1963, R. Thomas.

Associated specimens: República Dominicana, La Vega Province, La Vega, 1 (AMNH 40973); between Jarabacoa and La Vega (not mapped), 1 (SMF 25684).

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of grayish-brown dorsal zone with prominent buffy dorsolateral stripes and one transverse nuchal and one transverse scapular bar, sides darker gray-brown with no green or brick scales, lateral stripes faintly pinkish, venter white with a faint greenish tinge, throat greenish with prominent dark brownish-gray smudges and usually a transverse bar at the level of the second chin shield (Fig. 5e); size small (males to 66 mm, females to 52 mm in snout-vent length), low number of loreals (4.0), median head shields modally 4, frontoparietals modally 4, and supraorbital semicircles usually complete (59.4 percent).

Distribution: Known only from intermediate elevations on the north slopes of the Cordillera Central and presumably from La Vega, all in La Vega Province, República Dominicana (Fig. 3).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 66 mm, tail 108 mm; dorsal crest scales occiput-vent 45, dorsal crest scales occiput-axilla 16, dorsal crest scales on trunk 29, one half midbody scales 21, subdigital fourth toe tricarinate scales 21/22, loreals 4, temporals 10, enlarged auriculars 3/4; 3 prefrontal scales, row complete; 5 median head shields; 3 frontoparietal scales, row incomplete; 6/6

supraocular scales; supraorbital semicircles incomplete; parietal scales in contact.

Dorsal ground color dark grayish-brown, dorsolateral stripes buffy and conspicuous; a single nuchal and a scapular transverse dark bar; sides darker grayish-brown, lateral stripe pinkish. Mask present, somewhat hollowed centrally, and bounded below by a loreal buffy rectangle, a pair of buffy subocular blotches and a buffy lower temporal stripe, but not bordered with pale above. Top of head brown with some darker brown suffusion. Upper surface of both fore- and hindlimbs brown. Throat and venter white with a greenish tinge; throat with rather conspicuous blackish-brown smudges as far as the chest, and a barely discernible transverse black bar at the level of the second chin shield. Tail reddish-brown above, distinctly chevronate for its entire length, and bright orange below.

Variation: The series of 23 *L. p. budeni* has the following scale counts: dorsal crest scales occiput-vent 45 - 59 (mean 49.9), dorsal scales occiput-axilla 16 - 23 (mean 18.9), dorsal crest scales on trunk 26 - 35 (mean 30.8), one half midbody scales 20 - 25 (mean 22.0), subdigital fourth toe tricarinate scales 18 - 24 (mean 20.7), loreals 3 - 5 (mean 4.0), temporals 8 - 12 (mean 10.5), supraoculars 6/6 (25 specimens), 5/5 (1), 5/4 (1), 6/5 (3), 6/7 (1), semicircles more often complete than incomplete (59.4 percent), and parietals always in contact (100 percent). The prefrontal row always consists of 3 scales, the median head shields vary between 4 and 7 (mode 4), and the frontoparietal row has 2 to 5 scales (mode 4); the prefrontal row is always complete (30 specimens) and the frontoparietal row is more often complete than not (22 of 31 specimens). There is only one more specimen with 4 median head shields than with 5. The largest male measures 66 mm and the largest female 52 mm in snout-vent length; both are topoparatypes.

The series of male paratypes resembles the holotype in coloration and pattern, except that in subadult males the dorsal pattern is even more contrasting, the buffy lines being especially conspicuous. The tails may be more pink than orange in some males and the throat may have a distinctly greener tinge than the venter. There is never any green on the back or sides, and the sides likewise lack any red or brick pigments.

The females are gray-brown dorsally with prominent cream to buffy dorsolateral stripes and a series of four to seven transverse black bars before the hindlimbs, the lesser number resulting from the suppression of the alternating bands in larger specimens. In one female (ASFS V4229) the bars are reduced to a series of black points bordering the upper margins of the dorsolateral lines. The sides are dark brown (almost black) and the lateral stripes between the limbs are cream to yellowish. The venters are white in young females and with a greenish tinge in adults. The underside of the tail varies from yellow-orange to bright orange or pink. The throat is extremely mottled with black, and the venter is also heavily marked with black to dark gray dots and dashes.

Juvenile males resemble the adult females in coloration and pattern, but at times their throats (KU 93320) are even more densely spotted with black, almost forming a pale whitish reticulum in contrast to the thickly set spots.

Comparisons: L. p. budeni is distinctly different from its neighbor to the north, *L. p. scalaris.* These two races differ in depth of dorsal pigmentation, the one being very dark and the other considerably lighter. *Budeni* lacks the green hindlimbs and green venter of *scalaris,* and lacks both green and red in the lateral fields and on the dorsum. From all other subspecies, *budeni* differs in the very pale whitish-green venter, from *personatus* and *trujilloensis* in extensive throat and head dark coloration, from *mentalis* in lacking a conspicuous dark brown mask and in being very much darker dorsally and not having a yellow venter, and from *tarachodes* in lacking transverse throat bands. *L. p. budeni* is the smallest of the races of *L. personatus.* In having 4 frontoparietals modally, *budeni* differs from *trujilloensis, mentalis* and *scalaris,* all of which usually have 5. The extremely heavy ventral dotting of juvenile males and females helps in distinguishing these specimens from all other subspecies.

Although the median dorsal crest scales

of *L. p. budeni* are slightly attenuate and imbricate, in the available specimens of this race the scales are less attenuate than in all other subspecies. Perhaps none of the specimens is fully adult. However, in comparably sized males of other subspecies the scales already show the distinctly attenuate conformation. I can only assume that this particular character of *L. personatus* is not so well expressed in *budeni* as it is in other races.

Remarks: The single specimen from La Vega (AMNH 40973) I consider *L. p. budeni;* it is a female with a snout-vent length of 52 mm and thus is equal to the largest female of the subspecies. The very heavy throat spotting agrees well with the definition of *budeni,* and the dark dorsal color and prominent dorsolateral stripes likewise confirm this diagnosis.

Aside from the specimens from La Vega and between that city and Jarabacoa, all other material of *L. p. budeni* was taken about old buildings near the town of Buena Vista at an elevation of 2000 feet (656 meters). The lizards were not uncommon but were observed only on sunny days; since the region is extremely wet and rain is fairly regular as a daily occurrence, the lizards were rather difficult to secure except on particularly favorable and not rainy days. The general floral picture at the type locality is pine woods with ravines heavily wooded with deciduous trees. Mertens (*op. cit.*:49) reported taking a female *"L. p. mentalis"* (SMF 25684) from the pine-woods between Jarabacoa and La Vega.

L. p. budeni lies between the ranges of *L. p. scalaris* to the north and the very distinctive subspecies in the interior uplands of the Cordillera Central to the south. I imagine that *budeni* will be found to occur along the eastern flank of the Cordillera Central and also along the northern flank where the range does not abut directly upon the Valle de Cibao; in the latter situation, *L. p. scalaris* is the intermediate elevation race.

Leiocephalus personatus **agraulus,** new subspecies

Holotype: MCZ 81090, an adult male, from 1 mi. WSW Constanza, 4000 feet (1311 meters), La Vega Province, República Dominicana, one of a series collected 4 July 1963 by native collector. Original number X8658.

Paratypes: AMNH 94245-52, MCZ 81091-95, same data as holotype; CM 40570-75, UF 21328-34, same locality as type, 2 July 1963, native collector; ASFS V8612-19, V8640-47, USNM 156741-46, UIMNH 61624-32, KU 93322-29, RT 681-82, same locality as holotype, 3 July 1963, native collector; MCZ 79261-62, Constanza, La Vega Province, República Dominicana, 31 December 1963, J. D. Lazell, Jr.; MCZ 57983, Tireo, La Vega Province, República Dominicana, 23 July 1958, C. E. Ray and A. S. Rand.

Associated specimens: República Dominicana, San Juan Province, Río Arriba del Norte, 1950 feet (639 meters), 5 (ASFS V516-20); 7 km N Carpintero, 1 (MCZ 58068).

Diagnosis: A subspecies of *L. personatus* characterized in males by a combination of a tan to brown middorsal zone with dirty tan dorsolateral lines, a dark blackish-brown head with white supraorbital stripes, sides pea-green flecked with orange, venter and upper surfaces of hindlimbs bright pea-green, and throat immaculate but blackish and with some bright orange on the chin; size moderate (males to 74 mm, females to 60 mm snout-vent length), moderate number of loreals (4.5), median head shields modally 6, and supraorbital semicircles more often complete (88.7 percent).

Distribution: The interior uplands of the Cordillera Central in the Valle de Constanza and the Valle de Tireo, and the southern slope of the Cordillera Central in the region north of San Juan, República Dominicana (Fig. 3).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 70 mm, tail 98 mm; dorsal crest scales occiput-vent 50; dorsal crest scales occiput-axilla 17, dorsal crest scales on trunk 23, one half midbody scales 23, subdigital fourth toe tricarinate scales 21/21, loreals 5, temporals 11, enlarged auriculars 3/4; 3 prefrontal scales, row complete; 5 median head shields; 5 frontoparietal scales, row complete; 6/7 supraocular scales; supraorbital semicircles complete; parietal scales in contact.

Dorsal ground color tan, clearest medially

and much suffused with black laterally; dorsolateral lines dirty tan, beginning as white supraocular lines on the head and extending onto the base of the tail; sides bright pea-green, much flecked with orange; lateral line dirty tan and conspicuous. Dorsum with indications of about eight or nine transverse dark bars before the hindlimbs, of which the nuchal and scapular bars are the most obvious. Venter and throat bright pea-green as are also the upper surfaces of the hindlimbs; forelimbs tan above. Throat pea-green, much suffused with blackish anteriorly and chin bright orange. Tail brown above with prominent black to dark brown chevrons.

Variation: The series of 75 *L. p. agraulus* has the following scale counts: dorsal crest scales occiput-vent 41 - 55 (mean 46.7), dorsal crest scales occiput-axilla 13 - 21 (mean 15.7), dorsal crest scales on trunk 26 - 37 (mean 31.7), one half midbody scales 19 - 24 (mean 22.5), subdigital fourth toe tricarinate scales 18 - 25 (mean 21.7), loreals 2 - 8 (mean 4.5), supraoculars 6/6 (47 specimens), 5/5 (2), 5/6 (3), 6/7 (7), 7/7 (3), 6/8 (1), 11/9 (1), 9/9 (1), 6/9 (1), 11/10 (1), semicircles more often complete (88.7 percent), and parietals more often in contact (66.7 percent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 3 and 9 (mode 6), and the frontoparietal row has 3 to 10 scales (mode 5); the prefrontal row is almost always complete (70 to 71 specimens) and the frontoparietal row is more often complete than not (57 of 66 specimens). The largest male has a snout-vent length of 74 mm and the largest female measures 60 mm; both are topoparatypes.

The males from Constanza are remarkably constant in coloration and pattern. The dorsal transverse bar remnants noted in the holotype are not a regular feature of adult males of that size, and usually all but one nuchal and one scapular bar disappear in full adults; even these two bars may be absent, either with or without their old position shown by slightly darker crest scales in this anterior region. The white supraorbital line and the green venter, orange chin and duskily suffused throat are all regular features in subadult and adult males.

The single male from Río Arriba del Norte basically agrees with the Constanza males but is somewhat lighter with a tan middorsal zone, the lateral portions of which are dotted with maroon. The sides are green, flecked with maroon, and are especially bright green above the hindlimbs. The hindlimbs are green, distinctly flecked with black and pale green. The mask, which is not especially prominent in Constanza males due to their dark coloration, is black and prominent in the Río Arriba specimen, and is set off by a longitudinal gray subocular stripe; this feature may be present but much less obvious in Constanza males. The venter is green, washed centrally with yellow-orange, and the green throat is overlaid with orange. Although in some details of coloration this male does not agree completely with the specimens from the type locality, it certainly is related to the material from the more interior highlands and I group it with them *pro tem.*

Females from Constanza are reddish-brown dorsally with the dorsolateral lines indistinct and primarily delimited by black pigment—the black bases of the four to seven dorsal crossbars and the black dashes in the lateral fields. The ventral ground color is opalescent greenish, the chin and throat whitish-green. The throat is heavily marked with black spots or smudges, and the venter with black dashes laterally; centrally the venter is almost patternless. There is a distinct tendency for the anterior throat spots to fuse behind the chin to give one or two ill-defined crossbars.

Only one subadult and one juvenile male (MCZ 79261-62) show any indication of the female throat pattern; the smaller of these (36 mm snout-vent) is like the females both above and below, whereas the larger individual (51 mm snout-vent) shows the loss of the throat spots. Other males of comparable size already have lost all traces of the female throat pattern.

The female (56 mm) from Río Arriba del Norte is brown with a darker dorsal pattern, buffy dorsolateral lines, sides yellowish-tan with black dashes and the ventral ground color is yellowish, heavily spotted on the throat (and venter, especially laterally) with black.

Two features of the scalation of *agraulus*

are of interest. This is the only subspecies of *L. personatus* which lacks parietal contact in so many specimens (23 of 69); the highest incidence of this character other than in *agraulus* occurs in *scalaris* (6 of 207). Of all specimens of *L. personatus* examined, only 35 lack parietal contact, and of these 35, 23 are *agraulus*. Secondly, the wide variation of number of supraoculars is striking. In *agraulus* there are ten categories of supraocular combinations, ranging from 5/5 to 11/10. No other subspecies is comparable, the closest being *personatus* with seven categories. No other subspecies has any supraocular counts so high as *agraulus* except *mentalis* with one individual having a count of 11/10, the next highest in *mentalis* being a more orthodox 7/8.

Comparisons: L. p. agraulus, by virtue of its dark dorsal coloration, green and orange sides, white supraorbital line, immaculate but dusky green throat and bright orange chin, is easily separable from all other subspecies. Two more different subspecies than the "adjacent" *agraulus* and *budeni* are difficult to imagine; the vivid green sides and venter, and orange chin of *agraulus* stand in direct contrast to the less colorful and more sombre tones of *budeni*. *L. p. agraulus* is the only subspecies which has a head scale formula of 3-6-5, since only *agraulus* has six median head shields as the modal condition. The diversity of number of supraoculars has already been commented upon, as has also the relatively high number of specimens with parietals not in contact.

Remarks: The distribution of *L. p. agraulus* is the interior highlands of the Cordillera Central and apparently the southern slopes of this massif as well. Three races of *L. personatus* are associated with the periphery of the Cordillera Central: *scalaris* in the northwest, *budeni* in the northeast and *agraulus* in the south. Of these three subspecies, *agraulus* is the only one restricted to the Cordillera itself. Although the closest localities for *budeni* and *agraulus* are separated by only about 30 kilometers airline and although we collected extensively within this intermediate area, no *Leiocephalus* were encountered. In fact, none of the specimens of *agraulus* from near Constanza was secured by us. Natives told us that the lizards had been collected under rocks in a large open meadow, studded with a few pines, and partly under cultivation, in the Valle de Constanza. Since the weather at Constanza, even during the summer, is often very cool and usually rainy, to encounter these lizards abroad probably requires a warm and dry day—something which was seldom available during the two weeks we spent in the Constanza region. The small series from Río Arriba del Norte was secured by Richard Thomas by turning rocks in a pasture; the day was overcast and wet.

There are five other specimens from the central República Dominicana which require comment. These are all from *San Juan Province*, and from the following localities: 17 km E Vallejuelo, 1500 feet (492 meters), 1 (ASFS V298); 15 km E Vallejuelo, 1600 feet (525 meters), 1 (ASFS V299); 10 km E Vallejuelo, 3 (ASFS V300-01, V391). This lot of lizards comes from the Sierra de Neiba, which is separated from the Cordillera Central in this region by the Valle de San Juan, a high but dry valley which appears not to be inhabited by *L. personatus*. Thus the Sierra de Neiba populations are not in genetic continuity (at least directly) with *agraulus* on the southern slopes of the Central. The series consists of one adult (65 mm) and one tiny juvenile male, and three females. The adult male resembles *agraulus* in general, but is much paler (dorsal zone tan), has yellowish dorsolateral lines, has an orange chin and entirely green venter, with some rust on the sides which are *not* green. The hindlimbs are pea-green like those of *agraulus*. The throat is clear green and lacks the very conspicuous dusky wash of *agraulus*. When sufficient material from the Sierra de Neiba is available, I imagine that it will be found to differ from *agraulus* in several characters, although obviously derived from, or allied to, the more northern subspecies.

The Sierra de Neiba lizards lie approximately between the subspecies *personatus* in Haiti and *trujilloensis* in the south-central República Dominicana. However, they show no affinities with either of these two races but do break the extensive gap between the southern Haitian and Dominican segments of the species.

Specimens from St. Marc, Haiti

There are two other specimens of *L. personatus* which have not been mentioned. These are both from St. Marc, Dépt. de l'Artibonite, Haiti; one (AMNH 77569) is a young male with a snout-vent length of 48 mm and the other (MCZ 65455) is a female with a snout-vent length of 42 mm. Both were collected in 1928 and now are much faded. Both have a pale tan dorsal zone without any markings, a darker brown lateral band, prominent lateral stripes (but lack dorsolateral stripes). Both have the throats heavily blotched with black, and the female has some diffuse dark gray markings on the sides of the venter. In having a small preauricular and distinctly overlapping crest scales (although they are not especially attenuate nor would I expect them to be in so small a male) they are surely related to *L. personatus*. The geographically closest subspecies of *L. personatus* is *scalaris* to the northeast; the latter occurs at St. Michel de l'Atalaye, about 52 kilometers airline. The two localities are separated by the important Rivière de l'Artibonite and the Montagnes Noires (Monts Cahos), and St. Michel additionally lies on the relatively high Plateau Central at an elevation of 420 meters, whereas St. Marc is on the coast. It seems unlikely that the St. Marc specimens are *scalaris* (and they do not agree with that subspecies in pattern), and I merely assign them to the species *L. personatus* with the above comments.

Leiocephalus lunatus Cochran, 1934

Leiocephalus personatus lunatus Cochran, 1934, Occ. Papers Boston Soc. Nat. Hist., 8:153 (type locality — Santo Domingo, Distrito Nacional, República Dominicana).

Definition: A species of *Leiocephalus* characterized by a combination of 1) small size (males to 67 mm, females to 60 mm snout-vent length), 2) sexually dichromatic, males with black nuchal and shoulder patches usually at least indicated, and with a pair of enlarged postanal scales in males, 3) absence of a lateral fold, 4) dorsal scales imbricate, weakly denticulate, and keeled, ventral scales imbricate, smooth, and denticulate, 5) median dorsal crest scales enlarged, greatly attenuate and strongly overlapping (Fig. 2b and c), slightly lower than median dorsal caudal scales, 50 to 68 in occiput to vent distance, 6) one half midbody scales 19 to 27, 7) supraoculars usually 6/6, 8) loreals 2 - 8, 9) temporals 7 - 14, 10) supraorbital semicircles usually complete, 11) parietals always in contact, 12) median head scales varying between 3 and 10 (modally 4), 13) preauricular scale small (Fig. 2a), 14) throat in males with bold and discrete black spots on a white to pale gray ground, in females with faint gray dots, 15) ventral color pale yellowish to tan or lavender, 16) ventral pattern absent in both sexes, 17) mask absent, and 18) black neck and shoulder patches present.

Leiocephalus lunatus lunatus Cochran, 1934

Type locality: Santo Domingo, Distrito Nacional, República Dominicana.

Holotype: Field Museum of Natural History (= Chicago Natural History Museum) 166, an adult male with a snout-vent length of 64 mm (*fide* Cochran, 1941:233).

Diagnosis: A subspecies of *L. lunatus* characterized in males by a combination of tan to brown dorsal zone, often dotted with yellow, dorsolateral lines creamy and prominent, usually at least one nuchal and one scapular bar, lateral nuchal and scapular patches large, extensive and black (Fig. 7a), throat white to gray with large more or less uniformly sized black spots extending onto chest (Fig. 8a), ventral ground color variable from white and creamy to tan, extremely pale translucent green, or pale lavender on the sides of belly; size large (males to 67 mm, females to 55 mm snout-vent length), high number of loreals (4.7), median head shields modally 4.

Distribution: Southeastern shore of the República Dominicana from just west of Santo Domingo east across the Río Ozama to east of Boca Chica (Fig. 6).

Variation and discussion: The series of 28 *L. l. lunatus* has the following scale counts: dorsal crest scales occiput-vent 52 - 67 (mean 61.3), dorsal crest scale occiput-axilla 19 - 27 (mean 22.0), dorsal crest scales on trunk 33 - 45 (mean 39.0), one half midbody scales 21 - 27 (mean 24.2), subdigital fourth toe tricarinate scales 21 - 27 (mean 23.2), loreals 3 - 7 (mean 4.7), tem-

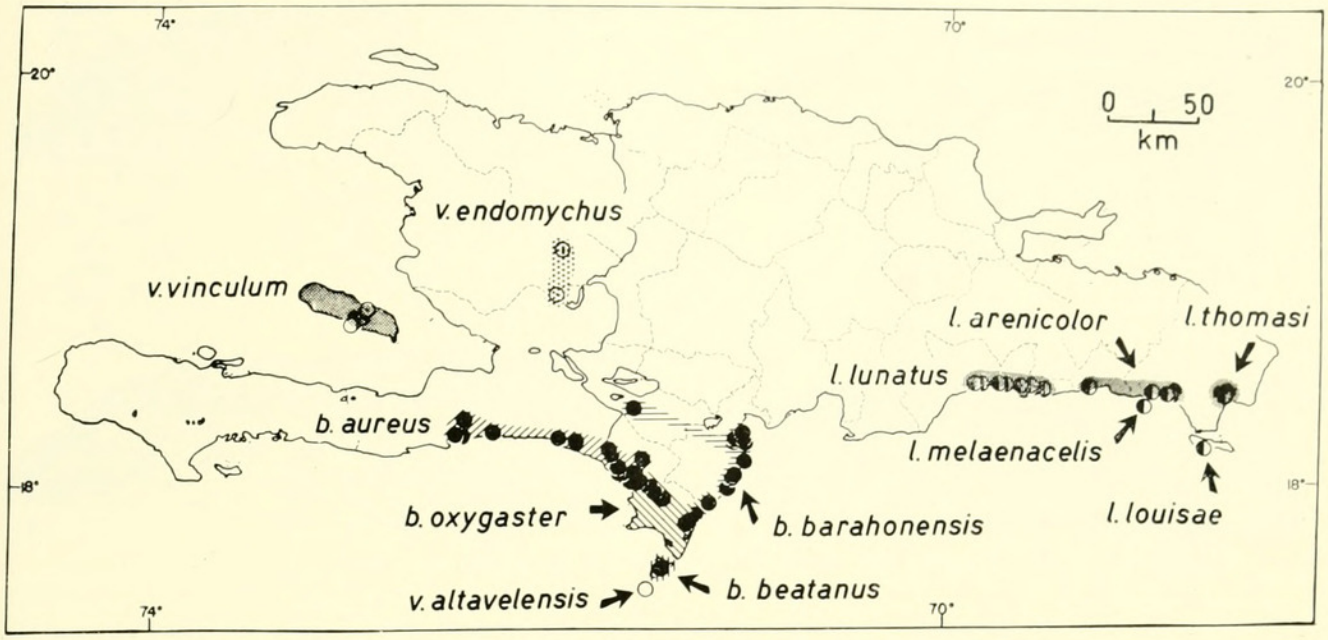

Figure 6. Hispaniola, showing the known distributions of three species of *Leiocephalus*, as follows: *L. lunatus* (semi-solid symbols); *lunatus*, fine vertical lines; *arenicolor*, fine diagonal lines, upper right to lower left; *thomasi*, fine diagonal lines, upper left to lower right. *L. barahonensis* (solid symbols); *barahonensis*, widely spaced horizontal lines; *oxygaster*, widely spaced diagonal lines, upper left to lower right; *aureus*, widely spaced diagonal lines, upper right to lower left; *beatanus*, widely spaced vertical lines. *L. vinculum* (hollow symbols): *vinculum*, light stippling; *endomychus*, dark stippling. Overlap of symbols in the region of Pedernales, República Dominicana, indicates area of intergradation between *oxygaster* and *aureus*.

porals 9 - 13 (mean 10.5), supraoculars 6/6 (19 specimens), 6/7 (4), 7/7 (3), semicircles usually complete (78.6 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 or 3 scales (mode 3), the median head shields vary between 4 and 7 (mode 4), and the frontoparietal row has 3 to 5 scales (mode 5); the prefrontal row is always complete (27 specimens) and the frontoparietal row is more often complete (19 of 25 specimens). The largest male measures 67 mm in snout-vent length, the largest females 55 mm; all are from 8.6 miles east of Santo Domingo.

When Mertens (1939:46-47) described *L. p. trujilloensis*, he pointed out that, at least insofar as his specimens indicated, the "subspecies" *trujilloensis* and *lunatus* (both described from the city of Santo Domingo) were separated by the Río Ozama. This wide river courses through the capital city, and although there are various names for districts of the city both on the east and west banks, with propriety all can be called Santo Domingo. With the recent collection of *L. lunatus* on the *west* side of the river (and thus within the supposed range of *trujilloensis*) and of a *trujilloensis* relative far to the *east* of the river within *lunatus* country, it is obvious that not only does the river not separate the two "subspecies" *trujilloensis* and *lunatus* but also that there are two distinct species involved, both of which occur on both sides of the river.

The series of specimens for which the data are presented above all originated on the east side of the river, and thus within orthodox *lunatus* territory. Males of this series are tan to brown with creamy and prominent dorsolateral lines. The head is brown and is not usually suffused with darker brown except rarely on the supraoculars. A nuchal and a scapular transverse bar are fairly common and some (not the largest) specimens have heavy dorsal yellow flecking. The sides are brightly colored; they vary from orange to brownish with green scales, and yellow and brick scales may also be admixed. The green scales often form vertical lateral bars which become yellow bars on the lower sides and lateral portions of the abdomen. The lateral line between the limbs is indistinct to absent. On the sides of the neck and shoulders above the forelimb insertion is a large jet black

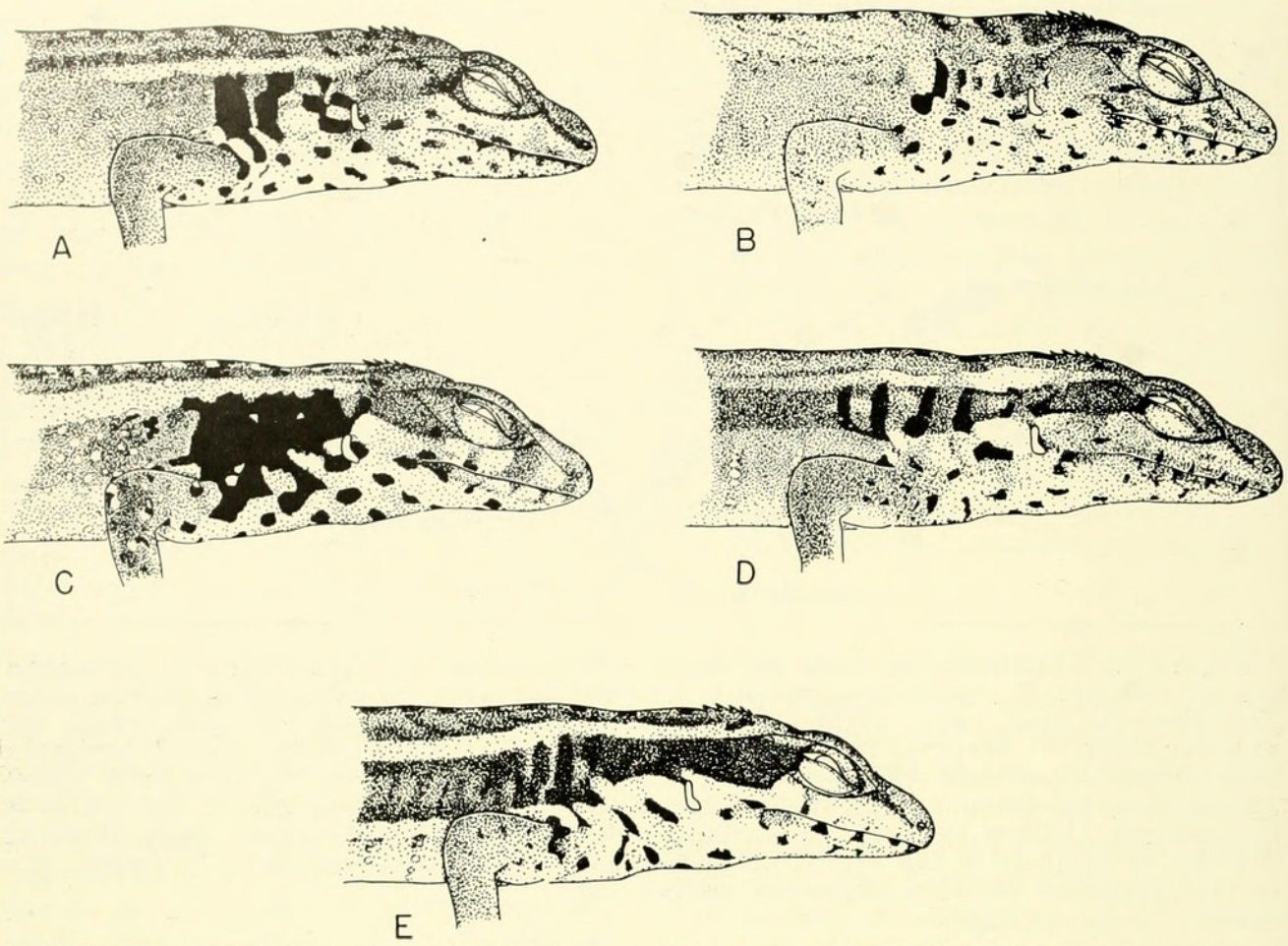

Figure 7. Lateral view of head and neck of five subspecies of *L. lunatus*, as follows: a) *L. l. lunatus*, ASFS V641, 0.9 km E Boca Chica, Distrito Nacional, República Dominicana; b) *L. l. arenicolor*, ASFS X8194, 0.5 mi. S San Pedro de Macorís, San Pedro de Macorís Province, República Dominicana; c) *L. l. melaenacelis*, MCZ 81096, holotype, western end, Isla Catalina, La Romana Province, República Dominicana; d) *L. l. thomasi*, MCZ 81097, holotype, 0.5 mi. NW Boca de Yuma, La Romana Province, República Dominicana; e) *L. l. louisae*, ASFS V3005, environs of Mano Juan, Isla Saona, República Dominicana.

patch, usually bi- or tripartite, but often complete and extensive. If any portion of the blotch is missing, it is the most anterior (nuchal) third. The blotch is never absent completely, and may be especially well delineated. The venter is regularly pale, varying from very pale green to pale tan, pale yellow, or even pale lavender, especially on the sides. The throat is white to pale gray, and is rather evenly covered by large black spots which usually extend onto the chest. These spots are bold, discrete, sharp-edged and all of about the same general diameter, so that there is an impression of rather uniform throat and chest spotting. These spots are comparable to, but certainly very distinct from, the dusky smudges which occur in the males of several races of *L. personatus*. The upper side of the hindlimbs may be pea-green, but usually they are tan. The tail is brownish-orange above, vaguely chevronate proximately and more boldly marked distally; the underside of the tail is orange.

Females resemble males dorsally, with a sandy to brown dorsal zone bounded by buffy dorsolateral lines. The sides are tan, lack longitudinal dark dashes which occur in female *L. personatus*, and at times have some scattered creamy scales as well. There are about seven vague dorsal chevrons before the hindlimbs. The tails are tan to brown above and are chevronate. The venter is immaculate white to grayish. The throat is pale grayish with slightly darker gray dots.

The smallest males (snout-vent lengths of 47 mm) are already patterned like adult males with heavy black throat and chest spotting.

The three specimens from west of the Río Ozama (ASFS V2471-73) are two males (snout-vent lengths 65 and 61 mm)

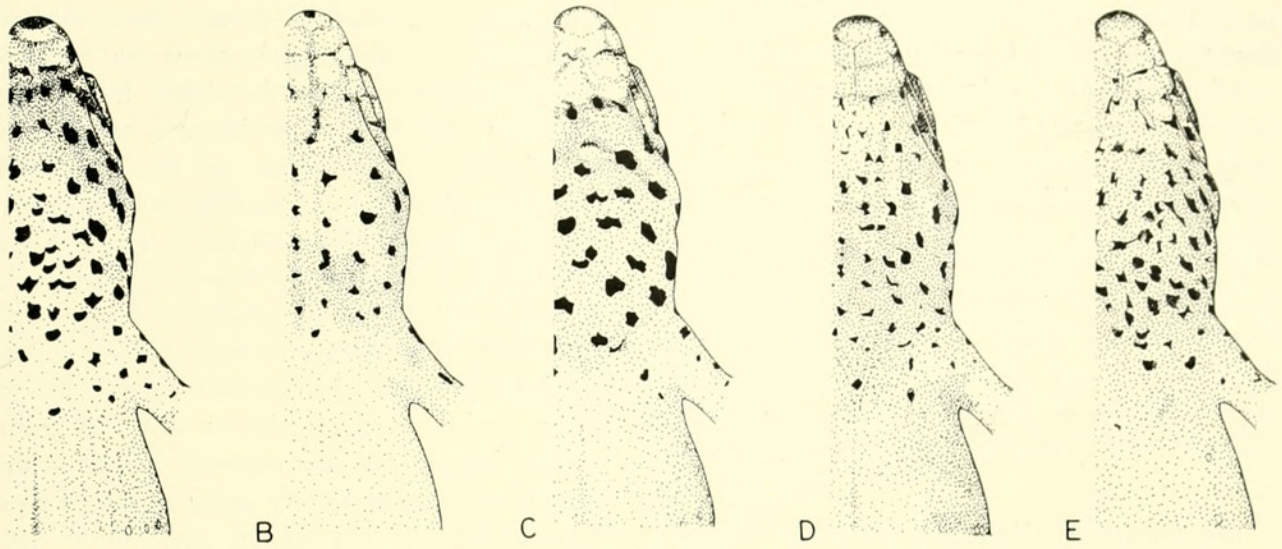

Figure 8. Ventral view of throats of males of five subspecies of *L. lunatus;* same specimens as Figure 7.

and a female (53 mm). They conform in size and scalation with the material from east of the river. The males do differ slightly, however, in having the throat dots much smaller and more widely separated than *lunatus* from the east side. If more material from west of the river becomes available, the differences in throat markings, if constant, should easily differentiate the two populations. This will also require examination of the type specimen which I have not studied. From Cochran's drawing (1941:Pl. 6A), at least the illustrated specimen agrees much better with specimens from east of the river.

As has been previously noted, *L. l. lunatus* occurs in part sympatrically with *L. p. trujilloensis.* The two can be readily distinguished by the nuchal-scapular blotch and heavy throat spotting in the former, in contrast to the black face, green venter and smudged throat of the latter. Females of the two species are equally distinct, the heavily dotted throat and venter of female *trujilloensis* contrast with the unspotted venter and very lightly spotted throat of *lunatus.* Since I have not taken both species at the same locality, I do not know if they occur syntopically.

L. l. lunatus is not especially abundant. The largest series was taken from a semi-arid cultivated area at the foot of the limestone bluffs which parallel the coast east of the Río Ozama. Here the lizards were taken on and among large concrete slabs and trash. Elsewhere they were collected in coastal situations, such as *Cocos* groves, but seldom were encountered commonly.

Specimens examined: República Dominicana, Distrito Nacional, 8.6 km W Santo Domingo, 1 (ASFS V2471); 5.9 km W Santo Domingo, 2 (ASFS V2473-74); Tres Ojos (not mapped), 1 (SMF 25552); 6 km E Santo Domingo, 2 (ASFS, V2481, V2484); 8.6 mi. (13.8 km) E Santo Domingo, 12 (ASFS X7822-31, RT 615-16); 16.7 mi. (26.9 km) E Santo Domingo, 1 (ASFS X7766); La Caleta (not mapped), 8 (SMF 25561, 25590-96); Boca Chica, eastern edge, 4 (ASFS V680-83); 0.9 km E Boca Chica, 10 (ASFS V639-48); 7 mi. (11.3 km) E Boca Chica, 1 (ASFS X7764).

Leiocephalus lunatus arenicolor Mertens, 1939

Leiocephalus personatus arenicolor Mertens, 1939, Abh. Senckenberg. Naturf. Ges., 449:48.

Type locality: Sandy seashore at San Pedro de Macorís, San Pedro de Macorís Province, República Dominicana.

Holotype: SMF 25715, a male with a snout-vent length of 53 mm (*fide* Mertens, *loc. cit.*).

Diagnosis: A subspecies of *L. lunatus* characterized in males by a combination of sandy to tan dorsal zone, often with a bronzy metallic sheen or flecked with creamy, dorsolateral lines faint (= unicolor with back) to white, grayish-sandy or buffy, at times one nuchal and one scapular transverse dark bar, but these are usually absent

or reduced to a series of dark dots on the dorsal crest scales, lateral nuchal and scapular patches always restricted and at times completely absent (Fig. 7b), throat white to gray with relatively few black dots of unequal sizes (which also may be absent completely) rarely extending onto chest (Fig. 8b), ventral ground color white to pale greenish, pale yellow-green, pale buffy or creamy, with sides of belly lavender-gray; size large (males to 65 mm, females to 53 mm snout-vent length), high number of loreals (4.5), median head shields modally 4.

Distribution: Southeastern coast of the República Dominicana from San Pedro de Macorís east to Boca Chavón (Fig. 6).

Variation and discussion: The series of 62 *L. l. arenicolor* has the following scale counts: dorsal crest scales occiput-vent 53 - 66 (mean 58.1), dorsal crest scales occiput-axilla 16 - 26 (mean 21.3), dorsal crest scales on trunk 33 - 46 (mean 36.7), one half midbody scales 20 - 26 (mean 23.0), subdigital fourth toe tricarinate scales 20 - 27 (mean 22.4), loreals 3 - 8 (mean 4.5), temporals 7 - 14 (mean 10.5), supraoculars 6/6 (32 specimens), 4/5 (2), 5/5 (5), 5/6 (5), 6/7 (2), 7/7 (3), 6/9 (1), semicircles usually complete (75.0 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 3 and 10 (mean 4), and the frontoparietal row has 1 to 6 scales (mode 4 or 5 with equal frequencies); the prefrontal row is almost always complete (61 of 63 specimens) and the frontoparietal row is more often complete (40 of 59 specimens). The largest males measure 65 mm in snout-vent length, the largest female 53 mm; the female is from San Pedro de Macorís and the males are from this locality and La Romana.

A series of 39 topotypes showed the following coloration and pattern. In males, the dorsum is tan to slightly darker with a bronzy metallic sheen. The dorsolateral lines are indistinguishable from the ground color to buffy. The head is light brown with some darker suffusion on the supraocular scales. The nuchal and scapular transverse brown bars are indicated by a median series of dark dots on the crest scales. The sides are slightly darker than the dorsum, and occasionally have some green or bronzy scales admixed. The lateral line between the limbs is always very obscure or absent. The sides of the neck and shoulder above the forelimb insertion have a much reduced black tripartite patch, which is often restricted to a few black fragments on the neck or may be absent entirely (ASFS X8195). The venter is white, pale greenish, or buffy. The throats are white to pale gray, and the black throat dots are small, rather irregularly scattered, of varying sizes, and may be completely absent except along the margin of the lower jaw. The upper side of the hindlimbs is dull green. The tail is brown dorsally with the chevrons poorly defined or absent and pale orange to pink below.

Females are like the males dorsally, but the dorsolateral lines are even less prominent. Females lack dorsal chevrons or transverse bars and instead have at least the neck and scapular region, and at times the entire back, with dark dots on the crest scales. The throats are pale gray dotted with vague slightly darker gray dots. The ventral ground color is pinkish to whitish and immaculate, and the underside of the tails is pale orange.

I include seven specimens (five males, two females) from La Romana and a series from Boca Chavón, both localities to the east of San Pedro de Macorís, with *arenicolor.* The La Romana series, which I did not see in life, resembles the topotypes fairly closely in pattern, although three of the males have the black neck and shoulder patch somewhat better developed than topotypes, and the throats of all males have the black dots somewhat more widely scattered than most San Pedro males. The two La Romana females have completely immaculate throats. The series of twenty-one specimens from Boca Chavón includes males with dorsal cream dotting, and the black neck and shoulder spot is restricted to absent. The sides are flecked with turquoise. The venter is pale yellow-green to creamy with lavender sides. The main difference between this lot and the topotypes is the presence of nuchal and scapular transverse bars, which persist into even the largest male. Since these specimens are inter-

mediate geographically between *arenicolor* and the race next to the east, it is not surprising that they resemble the latter in some characters, such as the persistent transverse bars. One of the series (one of two males from the east side of the Río Chavón) is very like the more eastern race in all dorsal features, but is closer to *arenicolor* in throat spotting. Everything considered, I place the Boca Chavón material with *arenicolor*, although acknowledging its intermediate characteristics.

L. l arenicolor occurs with *L. personatus* in part of its range (San Pedro de Macorís, Río Cumayasa). If the two occur syntopically, there should be no difficulty in separating them, since the *L. personatus* males from this region lack any prominent throat markings and the females have the throats and venters heavily dotted with dark gray to black. The subspecies *lunatus* and *arenicolor* are easily differentiated on the basis of the paler dorsal coloration, less prominent dorsolateral lines, and less spotted throat in the latter. The equal incidence of 4 and 5 frontoparietals (21 specimens in each category) in *arenicolor* differs from the mode of 5 in *lunatus*. Both subspecies are equally large.

The range of *lunatus* is separated from that of *arenicolor* by about 28 kilometers airline. There is one major barrier in this region—the Río Macorís which lies just to the west of San Pedro de Macorís; this river possibly separates the two subspecies. The topotypes were collected about the lighthouse just south of San Pedro de Macorís on sandy soil in and about a garbage dump, which they occupied with *Ameiva chrysolaema*, although the latter were much less abundant. The specimens from the mouth of the Río Chavón were collected in shady sea-grape stands along the beach, and here *L. l. arenicolor* was associated with *Ameiva taeniura*. The lizard from northeast of Boca Chavón was taken in wet rocky woods on a limestone ridge behind the settlement.

Specimens examined: República Dominicana, San Pedro de Macorís Province, 0.5 mi. (0.8 km) S San Pedro de Macorís, 43 (ASFS X8192-230, RT 647-50); *La Romana Province,* La Romana, 7 (MCZ 57135-37, 75079-82); mouth of Río Chavón, west side, 19 (ASFS V1042-60); Boca Chavón, 1 (ASFS V1073); 1 mi. (1.6 km) NE Boca Chavón, 1 (ASFS V1074).

Leiocephalus lunatus **melaenacelis**, new subspecies

Holotype: MCZ 81096, an adult male, from the western end, Isla Catalina, La Romana Province, República Dominicana, one of a series taken 20 August 1963 by David C. Leber, Ronald F. Klinikowski, Albert Schwartz, and Richard Thomas. Original number V571.

Paratypes: ASFS V572-75, V578-81, AMNH 94253-56, UIMNH 61633-36, RT 786-87, same data as holotype.

Diagnosis: A subspecies of *L. lunatus* characterized in males by a combination of tan to grayish-tan dorsal zone with very prominent gray to buffy dorsolateral lines, prominent black nuchal and scapular transverse bars in adults, large jet black nuchal and shoulder patch (Fig. 7c), upper surface of hindlimbs tan, spotted with dark brown and cream, throat white to pale gray with relatively few but large black spots which extend onto the chest (Fig. 8c), venter pale yellow with lavender sides; tail bright orange above; size moderate (males to 61 mm, females to 60 mm snout-vent length), high number of loreals (4.4), median head shields variable, with 5 and 6 having the same frequency.

Distribution: Isla Catalina, off the coast near La Romana, República Dominicana (Fig. 6).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 58 mm, tail 76 mm; dorsal crest scales occiput-vent 56, dorsal crest scales occiput-axilla 20, dorsal crest scales on trunk 36, one half midbody scales 25, subdigital fourth toe tricarinate scales 24/-, loreals 5, temporals ?, enlarged auriculars 4/4; 3 prefrontal scales, row complete; 4 median head shields; 3 frontoparietal scales, row complete; supraocular scales 7/6; supraorbital semicircles ?, parietal scales ?.

Dorsal ground color tan, medially with a pale creamy zone which is crossed by a series of pale tan "chevrons"; dorsal crest scales alternately cream and tan, depending upon the ground color on either side of

the crest; a black nuchal and a black scapular transverse bar, the latter the wider and more conspicuous; dorsolateral lines very bold and grayish and extending onto the base of the tail. Sides of neck and shoulder region above forelimb with a large and more or less solid jet black patch which extends anteriorly to (but not including) the temporal region. Upper surface of hindlimbs tan with cream and brown scales; forelimbs tan above with cream spots over entire member and black spots mostly on the brachium. Lateral line between limbs buffy and very distinct; sides very pale orange with pale greenish or tan scales admixed. Venter very pale yellow, lavender on sides, with contrasting rows of cream to greenish scales descending onto abdomen from sides. Throat pale gray with large black spots, all of about uniform size and uniform distribution, extending onto chest. Tail bright orange above, bright orange with some cream scales below.

Variation: The series of 17 *L. l. melaenacelis* has the following scale counts: dorsal crest scales occiput-vent 54 - 68 (mean 59.8), dorsal crest scales occiput-axilla 19 - 25 (mean 22.3), dorsal crest scales on trunk 32 - 44 (mean 36.8), one half midbody scales 21 - 27 (mean 24.3), subdigital fourth toe tricarinate scales 23 - 27 (mean 24.7), loreals 3 - 6 (mean 4.4), temporals 10 - 13 (mean 10.9), supraoculars 6/6 (6 specimens), 6/7 (4), 7/7 (3), semicircles more often complete (75.0 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 to 4 scales (mode 3), the median head shields vary between 4 and 7 (mode 5 and 6), and the frontoparietal row has 2 to 5 scales (mode 5). The prefrontal row is always complete (16 specimens) and the frontoparietal row is more often complete (10 of 14 specimens). The largest male has a snout-vent length of 61 mm, the largest female 60 mm.

Males resemble the description of the holotype in coloration and pattern with the following exceptions. Subadult and young males have the back more completely chevronate than the type, and the two bold black transverse bars are a late ontogenetic feature. No other male has so much black dotting on the forelimbs as the type. The black lateral nuchal and shoulder patch is always bold and conspicuous but may be somewhat less in extent than in the type. The tan hindlimbs with dark and light spots are a common feature of all the males.

The females are like males dorsally except that, because of a dark brown ground color, the buffy to yellowish dorsolateral lines are extremely bold. In contrast to females of other races, the backs of female *melaenacelis* are more or less chevronate for their entire lengths with about nine dark brown incomplete chevrons bordered posteriorly by pale tan before the hindlimbs. The sides are dark brown with no dark longitudinal dashes. The tail is orange-brown above and bright orange below. The venter is whitish to gray and the throat has a few very faint gray dots.

Young males resemble the females except that the throat spots are slightly darker and more prominent.

In scalation, the variation in mode of median head shields (5 or 6, five individuals in each category; four lizards have 4 median head shields) is unusual.

Comparisons: L. l. melaenacelis differs from *L. l. arenicolor* on the adjacent mainland in having large and equally sized throat spots and a large nuchal-shoulder patch, in having a boldly lineate dorsum and tan (versus green) hindlimbs, and an orange tail. Female *melaenacelis* are chevronate, whereas *arenicolor* females are not. The Catalina subspecies most closely resembles *lunatus* to the west, but the two can be differentiated by the much lighter dorsum and more contrasting pattern of male *melaenacelis,* the orange tails in both sexes of the insular subspecies, the green hindlimbs of male *lunatus,* and the chevronate pattern of female *melaenacelis.* Both *lunatus* and *arenicolor* reach a larger size than *melaenacelis,* and both have the median head shields modally 4, in contrast to 5 or 6 in the insular subspecies.

Remarks: The series of *L. l. melaenacelis* was taken in the late afternoon (after about 1400 hours), especially along the sandy beach under low coconut palms; a few specimens were seen and collected in rather mesic hammock woods, and others were taken in a grassy savanna where they sought refuge under blocks of limestone. When running, the bright orange underside of the

tail is very conspicuous, and even at rest the orange upper surface makes the lizards stand out in contrast to the pale sandy substrata. The lizards became active only in the mid-afternoon; on the day of our visit to Isla Catalina the weather was extremely hot and dry, and the more barren areas inhabited by *L. l. melaenacelis* were undoubtedly too hot at midday for these lizards. *L. l. melaenacelis* was collected with both *Ameiva lineolata* and *Ameiva chrysolaema.*

Leiocephalus lunatus **thomasi,** new subspecies

Holotype: MCZ 81097, an adult male, from 0.5 mi. (0.8 km) NW Boca de Yuma, La Romana Province, República Dominicana, one of a series collected 30 August 1963 by Albert Schwartz. Original number V856.

Paratypes: ASFS V857-60, RT 797, same data as type; ASFS V816-24, 0.3 mi. (0.5 km) NW Boca de Yuma, La Romana Province, República Dominicana, 29 August 1962, A. Schwartz, R. Thomas; MCZ 75083-123 + one unnumbered specimen (FN 5374), Boca de Yuma, La Romana Province, República Dominicana, 28 March 1963, C. E. Ray and R. Allen.

Diagnosis: A subspecies of *L. lunatus* characterized in males by a combination of grayish-tan dorsal zone, often chevronate and with a nuchal and a scapular black transverse bar, buffy dorsolateral lines bold and contrasting, a bold and extensive black nuchal-shoulder patch which often, because of the dark reddish-brown sides, is indistinct (Fig. 7d), upper surface of hindlimbs tan with scattered dark brown and pale tan scales, throat greenish-white to pale yellowish with bold black dots which are scattered, usually few in number, and of varying sizes on any throat (Fig. 8d), venter pale greenish, tail brownish-orange above; size large (males to 66 mm, females to 55 mm snout-vent length), low number of loreals (3.8), median head shields modally 4.

Distribution: Known only from the vicinity of Boca de Yuma in extreme eastern República Dominicana (Fig. 6).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 58 mm, tail 97 mm; dorsal crest scales indeterminate; one half midbody scales 22, subdigital fourth toe tricarinate scales 23/23, loreals 3, temporals 11, enlarged auriculars 2/5; 3 prefrontal scales, row complete; 4 median head shields; 5 frontoparietal scales, row complete; supraocular scales 6/6; supraorbital semicircles complete, parietal scales in contact.

Dorsal ground color grayish-tan, crest scales alternately black and golden, chevrons barely indicated, nuchal and scapular transverse bars slightly darker than chevron remnants; dorsolateral lines buffy and fairly prominent, extending onto the base of the tail. Sides of neck and shoulder region with a series of four black spots, the most posterior behind the forelimb insertion, and the one above the limb the largest. Upper surface of hindlimbs tan with scattered darker brown and turquoise scales; forelimbs tan speckled with buffy above. Lateral line between limbs obsolescent; sides dark reddish-brown with scattered turquoise flecks. Venter very pale greenish. Throat greenish-white with black dots of varying size but in general small and rather widely and variably separated from one another, and extending onto chest. Tail orange brown above, weakly chevronate proximally, and pale orange below.

Variation: The series of 52 *L. l. thomasi* has the following scale counts: dorsal crest scales occiput-vent 50 - 66 (mean 58.0), dorsal crest scales occiput-axilla 16 - 25 (mean 19.7), dorsal crest scales on trunk 32 - 44 (mean 37.8), one half midbody scales 19 - 24 (mean 22.1), subdigital fourth toe tricarinate scales 20 - 26 (mean 22.8), loreals 2 - 6 (mean 3.8), temporals 9 - 12 (mean 10.3), supraoculars 6/6 (33 specimens), 5/5 (1), 5/6 (4), 6/7 (5), 7/7 (2), 7/5 (1), semicircles more often complete (66.0 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 2 and 7 (mode 4), and the frontoparietal row has 2 to 6 scales (mode 5). The prefrontal row is almost always complete (49 of 50 specimens) and the frontoparietal row is more often complete (29 of 47 specimens). The largest male has a snout-

vent length of 66 mm, the largest female 55 mm.

L. l. thomasi is the most variable of the subspecies of *L. lunatus* as far as throat pattern is concerned. Dorsally, most males agree with the description of the holotype in coloration and pattern although fairly regularly the dorsa are weakly to moderately prominently chevronate. The nuchal and scapular transverse bars are usually much darker than in the type. Due to the dark sides, the black nuchal-shoulder patch is often not so obvious (MCZ 75115) as it is in the type, but it is always large and extensive, and may be solid or fragmented. The throat color varies between greenish-white and pale yellowish. The throat spots always vary in size on each throat, and are usually well separated. In some specimens (MCZ 75093, 75098 for instance) there is a tendency for the black spots on the central portion of the throat to form a pair of paramedian longitudinal lines, although the dots maintain their individuality and do not fuse—they are merely aligned into longitudinal rows. The black dots regularly extend onto the chest and onto the sides of the neck.

The females are dark reddish-brown dorsally with about nine complete or incomplete dark brown chevrons before the hindlimbs. The dorsolateral lines are creamy to buffy and distinct against the darker dorsum and the dark brown to black sides. The lateral line is cream to tan and is irregular or almost scalloped into a series of pale ovals extending between the limbs. The ventral ground color is white and there are some very pale gray dots on the throats; the abdomen as usual is immaculate. The tails are orange-brown above, weakly chevronate distally, and pale orange ventrally. The hindlimbs are brown, spotted with cream above. Juvenile males are patterned like females, even having the lateral lines scalloped; the throat dots are slightly darker, however.

Comparisons: From its adjacent neighbor, *L. l. arenicolor, thomasi* differs in having a much darker dorsum with prominent longitudinal lines, weakly chevronate males, brown versus green hindlimbs, and much larger black nuchal-shoulder patches and more heavily spotted throat. Females of *arenicolor* are not chevronate as are female *thomasi*, and lack the scalloped lateral line. From *lunatus, thomasi* differs in dark and lined dorsum, less heavily spotted throat (although the spots are comparable in these two races), and in having chevronate females. *L. l. thomasi* most closely resembles *melaenacelis.* The more strongly chevronate dorsum and dark reddish-brown lateral fields distinguish male *thomasi.* The entire chromatic picture of *thomasi* is brighter than *melaenacelis,* especially the pigments on the sides. Both races lack green hindlimbs in males. Females of the two can be distinguished by the darker coloration and the scalloped and irregular lateral lines of *thomasi.*

Remarks: The region between Boca de Yuma in the east and Boca Chavón in the west is presently inaccessible by road. I have already commented on the resemblance of one of two males from Boca Chavón (east side of the river) to *thomasi,* which has been interpreted to indicate that even this far west the genetic influence of *thomasi* is expressed in *arenicolor* populations.

At Boca de Yuma, specimens were collected on the mesic forested limestone ridge behind the settlement. Here the lizards were fairly abundant on and about rocks. The orange undersides of the tails made the lizards rather obvious against the more sombre leaf litter of the forest floor. In this area, *L. l. thomasi* was encountered with the shade-dwelling *Ameiva taeniura.*

Only 22 kilometers to the northeast of Boca de Yuma is Juanillo, the easternmost locality for *L. p. mentalis.* Presumably somewhere in this intermediate region the two species come in contact. Where they do, they should be easy to differentiate since *mentalis* has a solid yellow and immaculate throat and a prominent face mask.

Leiocephalus lunatus louisae Cochran, 1934

Leiocephalus personatus louisae Cochran 1934, Occ. Papers Boston Soc. Nat. Hist., 8:177.

Type locality: Isla Saona, República Dominicana.

Holotype: MCZ 37551, an adult male with a snout-vent length of 56 mm.

Diagnosis: A subspecies of *L. lunatus* characterized in males by a combination of

dark gray dorsal zone with chevrons usually indicated, dorsolateral lines white to creamy and bold, lateral nuchal and scapular patches variable, but usually restricted and often indistinguishable anteriorly from the dark gray to black lateral fields (Fig. 7e), throat white to faintly greenish with either very tiny and discrete, or large and discrete, dots extending onto the chest (Fig. 8e), ventral ground color pale yellow-green, hindlimbs tan, usually not spotted with dark or pale; size small (males to 57 mm, females to 50 mm snout-vent length), low number of loreals (3.9), median head shields modally 4.

Distribution: Isla Saona, República Dominicana (Fig. 6).

Variation and discussion: The series of 18 *L. l. louisae* has the following scale counts: dorsal crest scales occiput-vent 50 - 62 (mean 57.1), dorsal crest scales occiput-axilla 16 - 25 (mean 20.1), dorsal crest scales on trunk 32 - 46 (mean 37.0), one half midbody scales 21 - 26 (mean 22.3), subdigital fourth toe tricarinate scales 20 - 26 (mean 22.6), loreals 2 - 5 (mean 3.9), supraoculars 6/6 (12 specimens), 4/5 (1), 5/5 (1), 6/7 (1), 7/7 (1), semicircles usually complete (70.6 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 to 4 scales (mode 3), the median head shields vary between 4 and 7 (mode 4), and the frontoparietal row has 2 to 5 scales (mode 5); the prefrontal row is always complete (17 specimens), and the frontoparietal row is more often complete (12 of 16 specimens). The largest male measures 57 mm and the largest female 50 mm in snout-vent length.

The dorsal zone in males is charcoal gray with chevron remnants usually fairly prominent and with nuchal and scapular dark brown transverse bars. The dorsolateral lines are cream to white and thus stand out very boldly against the darker dorsal ground. The sides are dark gray to black, especially anteriorly, and thus the nuchal-shoulder black patch may be somewhat obscured. The patch itself is variable in extent, and may be entire or reduced to a sequential series of two or three discrete spots. In the known specimens it is never absent. The lateral line between the limbs is obsolete, and scalloped anteriorly. The tails are straw colored dorsally and mottled rusty to nearly uniform orange ventrally. The throats and chests are white to faintly greenish with dark brown to black spots. The spots themselves are extremely variable in size, the type (and especially the paratype, MCZ 37552) being at the lower extreme in throat spotting with very tiny and widely scattered dots. In some males the dots are quite large (ASFS V3006) and in others (ASFS V3005) somewhat smaller but still much larger than in the type. The anterior dots show a tendency in some lizards to form a pair of transverse bands at the level of the first and fourth chin shields. The throat dots regularly extend onto the chest. The venter is pale yellow-green with a series of greenish-yellow scales forming ventrolateral lines extending toward the midline from the sides.

The females are like the males dorsally, but have the chevrons more prominent and have the lateral line obvious and scalloped as well. The sides are very dark brown without longitudinal dark dashes. The venter is white, and the throats are faintly grayish with slightly darker indications of gray spotting. One female (ASFS V3014) lacks throat dots completely. The tails are brownish and distinctly chevronate above, and orange below.

The single juvenile male resembles the females in both coloration and pattern but has darker gray throat spots.

L. l. louisae is obviously most closely related to *L. l. thomasi* which presumably occupies the adjacent mainland. The Saona subspecies is distinctly smaller (57 versus 66 mm in males), and lacks the reddish-brown sides (having instead dark gray to black sides). Females of the two races are very similar but again the lateral coloration will separate them. The throat patterns of both *thomasi* and *louisae* are quite variable, but my impression is that the throat of *louisae* is in general less heavily marked than that of *thomasi.*

Since *louisae* is the smallest subspecies of *L. lunatus,* it is distinct from the balance of the races, being approached most closely by *melaenacelis.* From *arenicolor* and *lunatus, louisae* differs in having a less densely marked throat than the latter and a more

heavily marked throat than the former. The chevronate pattern of female *louisae* is not matched by females of these two western subspecies. The nuchal-shoulder patch in *louisae* is much more extensive than that of *arenicolor*. The differences in hindlimb coloration will separate *louisae* from both *lunatus* and *arenicolor*. *Louisae* differs from *melaenacelis* in having more (but smaller) throat dots in males and in much darker dorsal coloration; females of the two subspecies can be distinguished since *melaenacelis* lacks a scalloped lateral line.

Remarks: L. l. louisae is moderately abundant on Isla Saona where it occupies semiarid scrub grading into mangrove flats, and adjacent to shady woods. It occurs with *Ameiva taeniura* in the region about Mano Juan on the south coast.

Specimens examined: República Dominicana, Isla Saona, no other locality, 4 (MCZ 37551—type: MCZ 37552-54—paratypes); environs of Mano Juan, 14 (ASFS V3004-17).

Leiocephalus barahonensis Schmidt, 1921

Leiocephalus barahonensis Schmidt, 1921, Bull. Amer. Mus. Nat. Hist., 44(2):15 (type locality—Barahona, Barahona Province, República Dominicana).

Definition: A species of *Leiocephalus* characterized by a combination of 1) moderate size (males to 80 mm, females to 64 mm snout-vent length), 2) sexual dichromatism not pronounced dorsally but throat pattern somewhat variable between sexes, and males with two pairs of enlarged postanal scales, 3) absence of a lateral fold, 4) dorsal scales imbricate, strongly denticulate or tricuspid, and keeled, ventral scales imbricate, smooth, and denticulate, 5) median dorsal crest scales slightly enlarged, not attenuate, slightly imbricate (Fig. 9b and c), slightly lower than median dorsal caudal scales, 42 to 57 in occiput to vent distance, 6) one half midbody scales 16 to 24, 7) supraoculars usually 6/6, 8) loreals 2-8, 9) temporals 3-7, 10) supraorbital semicircles usually incomplete, 11) parietals always in contact (one exception of 346 specimens examined), 12) median head scales varying between 2 and 6, 13) preauricular scale extremely enlarged (Fig. 9a), 14) throat in both sexes with a gray to black reticulum, black transverse bars, or dark smudges, 15) ventral color bright orange or orange-yellow, 16) ventral pattern absent in both sexes, 17) mask absent, and 18) black neck and shoulder patches absent.

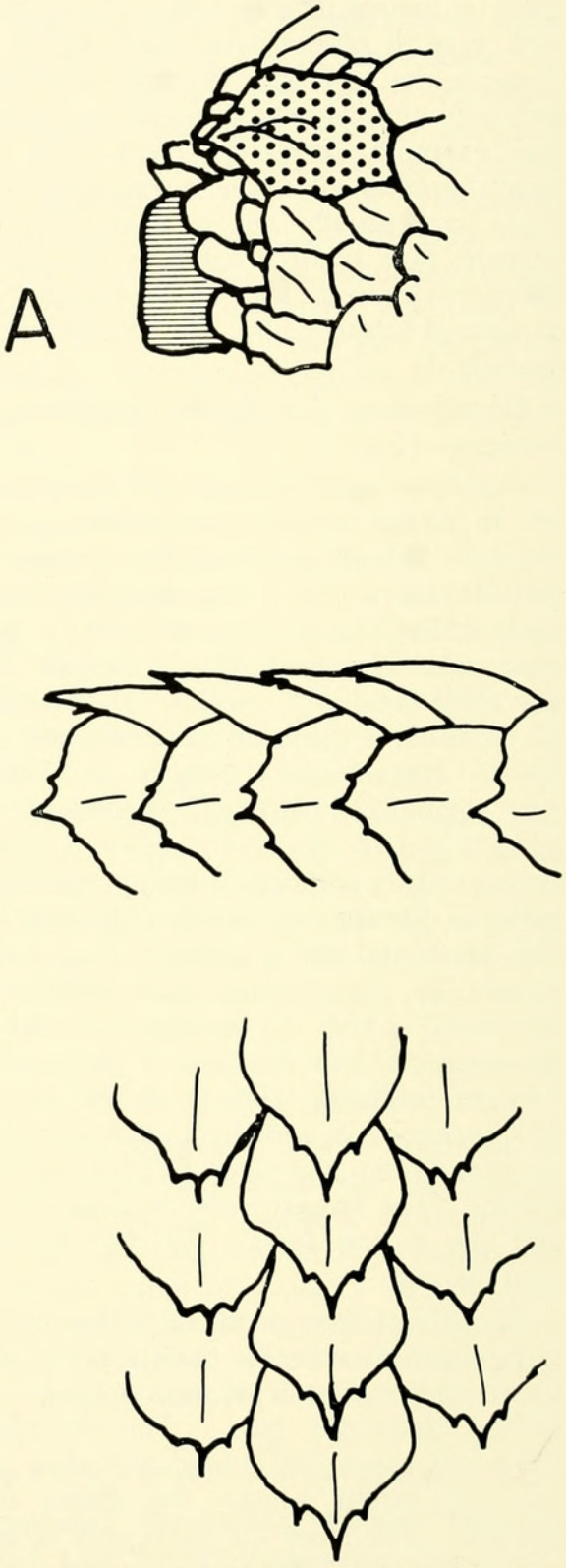

Figure 9. Scale features of *L. barahonensis*, showing a) auricular opening (horizontal lines) and enlarged preauricular scale (stippled); b) lateral view of median dorsal crest scales; and c) dorsal view of median dorsal crest scales. *L. vinculum* agrees with *L. barahonensis* in (b) and (c) but resembles Fig. 2(a) in preauricular scale size.

Leiocephalus barahonensis barahonensis Schmidt, 1921

Type locality: Barahona, Barahona Province, República Dominicana.

Holotype: AMNH 2736, an adult male with a snout-vent length of 70 mm (George W. Foley, pers. com.).

Diagnosis: A subspecies of *L. barahonensis* characterized in males by a combination of a broad dorsal zone varying from golden-yellow to slightly reddish or brown, and without an included pair of paramedian dorsal stripes, dorsolateral light stripes indistinct, throat dark (gray, dirty orange, gray with bronzy sheen) with a heavy black pattern of lines and smudges, indistinct on the dark ground color (Fig. 11a), ventral ground color yellow-orange to bright orange, frontoparietals modally 5.

Distribution: Independencia and Barahona provinces in the República Dominicana, from near El Naranjo on the west to Paraíso on the south, both to the north and east of the Sierra de Baoruco (Fig. 6).

Variation and discussion: The series of 18 *L. b. barahonensis* has the following scale counts: dorsal crest scales occiput-vent 48 - 54 (mean 51.1), dorsal crest scales occiput-axilla 15 - 20 (mean 17.6), dorsal crest scales on trunk 30 - 36 (mean 33.4), one half midbody scales 18 - 21 (mean 19.8), subdigital fourth toe tricarinate scales 20 - 26 (mean 22.5), loreals 2 - 6 (mean 4.1), temporals 7 - 10 (mean 8.2), supraoculars 6/6 (10 specimens), 5/5 (2), 5/6 (3), 6/7 (2), 7/7 (2), semicircles always incomplete (100 percent) and parietals always in contact (100 percent). The prefrontal row consists of 2 or 3 scales (mode 3), the median head shields vary between 3 and 6 (mode 4), and the frontoparietal row has 4 to 7 scales (mode 5); the prefrontal row is always complete (18 specimens) and the frontoparietal row is usually complete (14 of 18 specimens). The largest male measures 74 mm in snout-vent length, the largest female 60 mm; both are topotypes.

L. b. barahonensis is poorly represented in collections in contrast to the larger series of the three other subspecies of *L. barahonensis*. The coloration (but not especially the pattern) seems to be quite variable. Males are golden-yellow to slightly reddish (Barahona) or brown (southwest of Barahona) dorsally and lack any clear-cut paramedian dark lines, although these may be slightly indicated. The dorsolateral stripes are inconspicuous and fuse almost imperceptibly with the dorsal zone, thereby giving the dorsal zone somewhat paler (but concolor) edges. The head is tan and distinct from the dorsal zone in color. The sides are dark brown with or without a few green or turquoise scales. The lateral stripe between the limbs is dull and inconspicuous. The venter is bright orange to yellow-orange, always very vivid, and these colors continue onto the underside of the tail and hindlimbs. The throats vary from gray to dirty orange (= orange greatly suffused with gray) or gray with a bronzy sheen, and the throat pattern consists of a more or less random series of black lines or smudges on a darker background, extending onto the chest. The entire throat pattern is much clouded by the dark ground color and is not boldly distinct. Often there are a few yellow scales scattered on the throat. The chin is either white (and thus in strong contrast to the balance of the throat) or pale gray, the latter color if the balance of the throat is darker gray. The hindlimbs are brown above, with some darker brown marblings; the forelimbs are tannish-brown.

Females are tan to grayish-tan dorsally, either with or without some darker smudges (= chevron remnants) in the dorsal zone, and without conspicuous dorsolateral stripes. The sides are gray or dark brown with a pale blue-green suffusion and without longitudinal dark dashes; the lateral line is gray. The throats are white with a random gray to black pattern of transverse lines and smudges. The venter is opalescent. The underside of the tail is white to pale tan.

A juvenile male with a snout-vent length of 27 mm has the throat bright orange and the underside of the tail orange also. The pattern of this young individual is comparable to that of young females. No females of comparable size had an orange throat.

L. b. barahonensis occupies the foothills and associated lowland areas on the north and east sides of the Sierra de Baoruco, from El Naranjo in the west to Paraíso in

the south. It does not invade the arid Valle de Neiba and prefers somewhat more mesic situations, such as forest. Specimens have also been collected along the coast in palm groves, although in the city of Barahona, *L. b. barahonensis* is greatly outnumbered by *L. schreibersi*. Mertens (*op. cit.*:44-45) reported *L. b. barahonensis* (as *L. p. barahonensis*) from Barahona (where he collected four females), Fondo Negro on the north side of the Río Yaque del Sur, and also considered a half-grown female from Azua as this subspecies. The latter two records are based upon specimens which Mertens himself doubted were *barahonensis*, since both have completely unmarked throats—a condition not known in the species *L. barahonensis*. Although I have not examined these lizards, I too doubt very strongly that they are *L. b. barahonensis* and there is no reason to extend the range of the subspecies into the Fondo Negro region. The habitat noted for the Fondo Negro individual *(Kakteen-Buschwald)* likewise is not typical for *L. b. barahonensis*. The four females taken by Mertens south of Barahona on the road to Paraíso were collected in dry forest in a stone pile. Altitudinally, *L. b. barahonensis* occurs from sea level to 1000 feet (328 meters) near El Naranjo.

As noted above, *L. b. barahonensis* is sympatric (but usually not syntopic) with *L. schreibersi*. The two are easily distinguishable on the basis of the lateral fold in *schreibersi* and the much more vivid colors of *barahonensis; schreibersi* has a pale sandy-tan to pale gray overall coloration and lacks an orange or yellow-orange venter.

There is a single specimen (USNM 75906) from "Bayeux, near Port-au-Prince" which is *L. barahonensis*. Bayeux is presently not locatable. The lizard is an adult male with a snout-vent length of 79 mm, has incomplete semicircles and also, remarkably, lacks frontoparietal scales completely. The throat pattern consists of a few dark smudges on a lighter ground. This pattern does not resemble that of *L. b. barahonensis* and is even somewhat extreme for the south coastal *L. b. aureus*, which has a lightly patterned throat. Since *L. b. barahonensis* occurs so close to the Dominico-Haiti border at El Naranjo, it is to be expected in Haiti along the northern flank of the Morne des Enfants Perdus. However, I doubt that the Bayeux specimen is a Haitian *L. b. barahonensis*. The specimen was collected by J. S. C. Boswell, who also collected a specimen of *L. b. aureus* from the "Artibonite Valley", far to the north of, and separated by the Massif de la Selle and the Cul de Sac Plain from the known distribution of that subspecies. Boswell also collected the holotype of *aureus*. It is thus certain that Boswell collected within the range of *aureus*. I suspect that USNM 75906 is in actuality a specimen of *L. b. aureus* from within the recognized distribution of that subspecies.

Specimens examined: República Dominicana, Independencia Province, 1 km W El Naranjo, 1000 feet (328 meters), 3 (ASFS X9940-42); *Barahona Province,* Barahona, 4 (ASFS X9709-12); Barahona Aviation Field, Barahona, 1 (MCZ 43810); 4 km NW, 1 km SW Barahona, 2 (ASFS V202, RT 769); 4 km NW, 2 km SW Barahona, 500 feet (164 meters), 3 (ASFS V205-07); 2 km SE Barahona, 2 (ASFS X9518-19); 3.3 mi. (5.3 km) NE La Ciénaga, 1 (ASFS X9383); 9 mi. (14.5 km) SW La Ciénaga, 1 (ASFS X9449); Paraíso, 2 (ASFS V298-99); 6 km SW Paraíso, 1 (ASFS V297).

Leiocephalus barahonensis **oxygaster,** new subspecies

Holotype: MCZ 81098, an adult male, from 13.1 mi. (21.1 km) SW Enriquillo, Pedernales Province, República Dominicana, one of a series collected 22 July 1963 by Albert Schwartz and Richard Thomas. Original number X9417.

Paratypes: ASFS X9418-26, RT 710-11, same data as holotype; USNM 156747-49, same locality as holotype, 30 July 1963, D. C. Leber, A. Schwartz, R. Thomas; ASFS V4419, same locality as holotype, 10 December 1964, R. Thomas; CM 40576, 1.3 mi. (2.1 km) NW Oviedo, Pedernales Province, República Dominicana, 30 July 1963, R. Thomas; KU 93330-32, 5 mi. (8.1 km) NE Oviedo, Pedernales Province, República Dominicana, 30 July 1963, D. C. Leber, A. Schwartz; AMNH 94257-59, 5 mi. (8.1 km) NE Oviedo, Pedernales Province, República Dominicana, 7 August 1963, D. C. Leber, R. Thomas; UF 21335-37, 3 km SW

Enriquillo, Barahona Province, República Dominicana, 7 August 1963, D. C. Leber, R. Thomas; MCZ 58031-33, Oviedo, Pedernales Province, República Dominicana, 20 August 1958, C. E. Ray and A. S. Rand.

Associated specimens: República Dominicana. Pedernales Province, 30 km NW Oviedo, 4 (MCZ 58027-30); 20 km NW Oviedo, 1 (ASFS X9889); 22 km SE Pedernales, 2 (ASFS X9887-88); 16 km SE Pedernales, 1 (MCZ 58037); 15 km SE Pedernales, 1 (ASFS X9885).

Diagnosis: A subspecies of *L. barahonensis* characterized in males by a combination of brown broad dorsal zone which is usually dark (some shade of brown) but varying toward brownish-orange or vivid orange-red, usually without an included pair of paramedian dark stripes, dorsolateral stripes moderately distinct, throat pale cream to dark gray with a pattern of either about three or four black crossbars or a bold black reticulum (Fig. 10a and 11b), ventral ground color golden yellow-orange to bright orange; frontoparietals modally 4.

Distribution: The Península de Barahona, from south of Enriquillo in the east to about 22 kilometers southeast of Pedernales in the west; intergradation between *oxygaster* and *aureus* occurs in a narrow zone 12 to 16 kilometers southeast of Pedernales (Fig. 6).

Description of the holotype: An adult male with the following measurements and counts: snout-vent length 72 mm, tail 76 mm, practically all regenerated; dorsal crest scales occiput-vent 42, dorsal crest scales occiput-axilla 13, dorsal crest scales on trunk 29, one half midbody scales 19, subdigital fourth toe tricarinate scales indeterminate; loreals 5, temporals 9, enlarged auriculars 2/4; 3 prefrontal scales, row complete; 4 median head shields; 4 frontoparietal scales, row complete; supraocular scales 6/6; supraorbital semicircles incomplete, parietal scales in contact.

Dorsal ground color brown with buffy dorsolateral stripes moderately distinct; dorsal zone suffused with darker above dorsolateral stripes but there are no clearly defined paramedian lines; neck with some scattered dark brown flecks, top of head brown. Sides dull orange with scattered blue-green scales; lateral lines absent. Throat pale yellow, suffused with some gray before

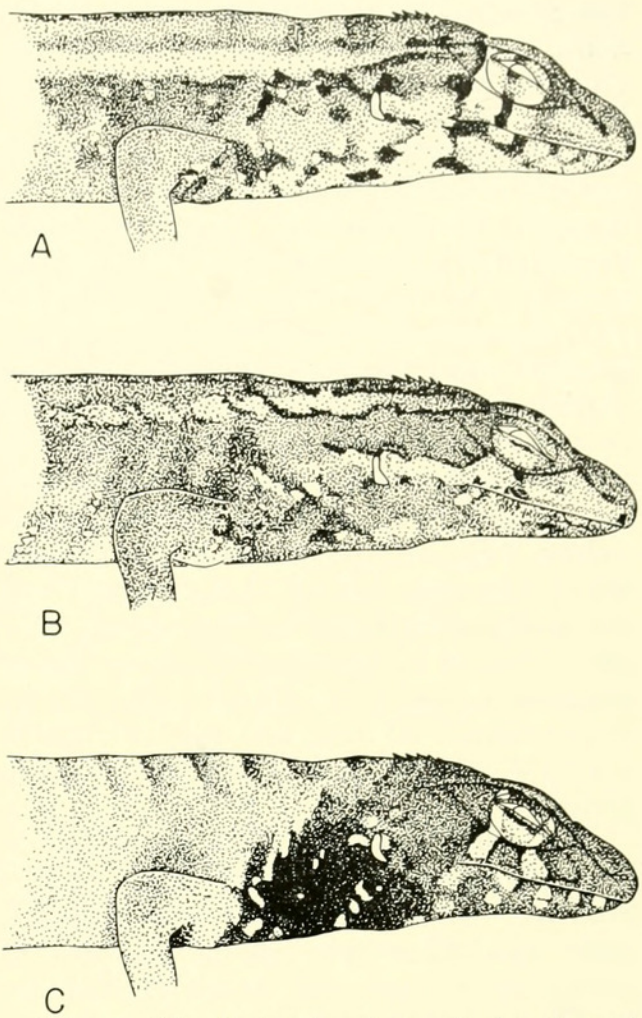

Figure 10. Lateral view of head and neck of one subspecies of *L. barahonensis* and two subspecies of *L. vinculum*, as follows: a) *L. b. oxygaster*, MCZ 81098, holotype, 13.1 mi. SW Enriquillo, Pedernales Province, República Dominicana; b) *L. v. vinculum*, ASFS X2491, 1.5 mi. S Etroits, Ile de la Gonâve, Haiti; c) *L. v. endomychus*, MCZ 81099, holotype, 3.4 mi. NE Barrage de Péligre, Dépt. de l'Ouest, Haiti.

chest, chin white; throat pattern four complete transverse black bars (the last two continuous dorsally with black subocular and postocular stripes on the face and temporal region) followed by a series of about six ill-defined and incomplete transverse bars, two of which are on the chest; these latter bars are composed of series of black (anteriorly) to gray (posteriorly) smudges. Ventral color bright golden yellow-orange, continuous onto underside of tail and hindlimbs. Upper side of hindlimbs brown with scattered darker brown flecks; forelimbs tan above. Tail tan and without chevrons above.

Variation: The series of 35 *L. b. oxygaster* has the following scale counts: dorsal crest

scales occiput-vent 42 - 52 (mean 47.3), dorsal crest scales occiput-axilla 12 - 20 (mean 15.6), dorsal crest scales on trunk 29 - 37 (mean 31.9), one half midbody scales 17 - 21 (mean 19.0), subdigital fourth toe tricarinate scales 20 - 26 (mean 22.9), loreals 2 - 6 (mean 3.9), temporals 7 - 10 (mean 8.6), supraoculars 6/6 (23 specimens), 5/5 (1), 5/6 (3), 6/7 (5), 7/7 (3), semicircles more often incomplete (75.0 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 3 and 5 (mode 4), and the frontoparietal row has 3 to 5 scales (mode 4). The prefrontal row is almost always complete (36 of 37 specimens) and the frontoparietal row is more often complete (26 of 37 specimens). The largest male has a snout-vent length of 80 mm, the largest female 60 mm; the male is from 30 km NW Oviedo and the female is from Oviedo.

The males agree in details of coloration and pattern with the description of the holotype. A male from 22 km SE Pedernales (and thus approaching the area of intergradation between *oxygaster* and *aureus*) is dull golden-orange above, with the sides and hindlimbs rust, and with a vivid bright orange-red venter—a brilliantly colored lizard. No other more eastern specimens of *oxygaster* are so brightly colored above. This individual, however, has the throat pattern of *oxygaster*. In eastern males, the chin varies from white to pale whitish-green, and the throat from pale gray to yellow, overlaid with the black throat pattern. The pattern itself is variable but usually consists of about four transverse black bars followed by an area of black to gray smudges, at times (as in the type) oriented into a series of additional (but less complete and well defined) black bars. This basic pattern may be much distorted and obscured by the dark ground color in some specimens, or the two more posterior transverse bars may be fragmented. In general there is usually some indication of transverse markings. The dorsa are usually dark (most often some shade of brown) and there may be faint indications of dark paramedian stripes, but these are never bold. The neck often has a few scattered dark flecks as in the type. The blue-green lateral scales extend onto the venter as rows of isolated blue-green scales, and stand out in strong contrast to the ventral color.

The females are brown above like the males, and often have a series of about ten

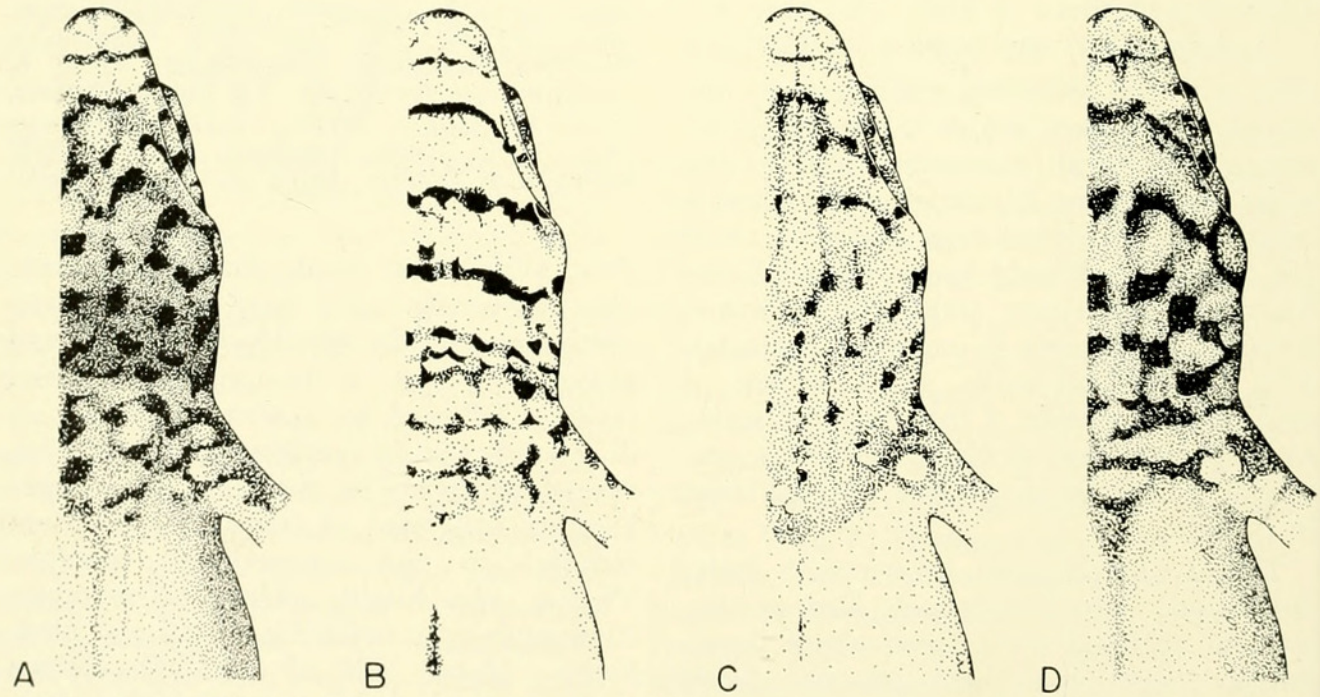

Figure 11. Ventral view of throat of males of four subspecies of *L. barahonensis*, as follows: a) *L. b. barahonensis*, ASFS X9708, Barahona, Barahona Province, República Dominicana; b) *L. b. oxygaster*, MCZ 81098, holotype, 13.1 mi. SW Enriquillo, Pedernales Province, República Dominicana; c) *L. b. aureus*, ASFS X9756, 1 km E Pedernales, Pedernales Province, República Dominicana; d) *L. b. beatanus*, ASFS V2732, Isla Beata, República Dominicana.

paramedian dark brown chevron remnants above the buffy dorsolateral lines. The throats are pale cream and the venter dull yellowish-gray. The throat pattern is much as described for the males, with a series of four transverse bars followed by some dark gray smudges; however, as in the males, the throat pattern is variable and may even be reticular. There is always, however, some indication of the transverse bars. The sides are dark brown and have no longitudinal dark dashes. The undersides of the hindlimbs are pale yellow-orange. The tail is a dull orange brown above and is usually chevronate. The hindlimbs are brown with both darker and lighter flecking, and the forelimbs are brown above.

Comparisons: The races *barahonensis* and *oxygaster* can be differentiated by the throat pattern, which in the nominate subspecies is not transversely oriented and lacks bars. The modal frontoparietal condition of 4 scales in *oxygaster* differs from the 5-scale mode in *barahonensis*. In coloration above the males of the two races are comparable, but *oxygaster* in general is darker than *barahonensis;* the dorsolateral lines are more prominent in *oxygaster* than in the more northern race.

Remarks: The distribution of *L. b. oxygaster* includes the major portion of the Península de Barahona, to the southeast and south of the Sierra de Baoruco. At the type locality, the lizards were abundant in shady hammock woods and in dried mangrove flats adjacent to the Laguna de Oviedo, preferring the latter habitat to the former. On the north, *oxygaster* (3 km SW Enriquillo) approaches *barahonensis* (6 km SW Paraíso) in Barahona Province; the distance separating the two races at this point is about 12 kilometers airline. As has been pointed out by myself and others, the eastern coast of the Península de Barahona lacks any coastal plain in many areas, the mountains descending into the ocean. The region between Enriquillo in the south and La Ciénaga on the north (and thus including Paraíso) is characterized by this abrupt coast. In fact, Paraíso lies in a valley which has associated with it a small bit of coastal plain and beach. Undoubtedly this abrupt coastline has caused the differentiation of *L. barahonensis* into two races in this area, as it has in other reptiles.

L. b. oxygaster grades rather rapidly into *aureus,* the subspecies to the west. This area of intergradation, which lies about 12 and 16 kilometers southeast of the town of Pedernales, lies in the arid region of the Península de Barahona and is not correlated with any obvious topographic features. At least to the east (within the range of *oxygaster*) some specimens are closer to *aureus* than to the expected subspecies (see comments above on the specimen from 22 km SE Pedernales). The two races may be divided fairly well at the line mentioned.

As far as known, *L. b. oxygaster* has a completely lowland range. No specimens have been taken on the mountain slopes. Both *barahonensis* to the north and *aureus* to the west occur at higher elevations, and it is likely that *oxygaster* does so as well. No other species of *Leiocephalus* is sympatric with *L. b. oxygaster.*

Leiocephalus barahonensis aureus Cochran, 1934

Leiocephalus personatus aureus Cochran 1934, Occ. Papers Boston Soc. Nat. Hist., 8:175.

Type locality: Jacmel, Dépt. de l'Ouest, Haiti.

Holotype: USNM 75909, an adult male, with a snout-vent length of 68 mm (*fide* Cochran, 1941:224).

Diagnosis: A subspecies of *L. barahonensis* characterized in males by a combination of broad dorsal zone gray to golden with moderately prominent gray to cream dorsolateral stripes, usually without a pair of included paramedian dorsal dark stripes, throat white to gray with a pattern of scattered gray to black spots, seldom aligned into transverse rows (Fig. 11c), ventral ground color dirty yellowish to bright orange; frontoparietals modally 5.

Distribution: From Jacmel and Méyer along the southeastern coast of Haiti east to the vicinity of Pedernales, República Dominicana (Fig. 6).

Variation and discussion: The series of 127 *L. b. aureus* has the following scale counts: dorsal crest scales occiput-vent 44 - 57 (mean 50.8), dorsal crest scales occiput-axilla 13 - 22 (mean 17.0), dorsal crest scales on trunk 28 - 39 (mean 33.9), one half midbody scales 17 - 23 (mean

19.8), subdigital fourth toe tricarinate scales 19-29 (mean 23.7), loreals 2-8 (mean 4.0), temporals 7-10 (mean 8.8), supraoculars 6/6 (100 specimens), 5/5 (3), 5/6 (8), 6/7 (15), 7/7 (7), 7/8 (1), 8/8 (1), semicircles usually incomplete (84.1 percent) and parietals always in contact (one exception of 142 specimens examined). The prefrontal row consists of 2 to 6 scales (mode 3), the median head shields vary between 3 and 7 (mode 4), and the frontoparietal row has 2 to 6 scales (mode 5); the prefrontal row is almost always complete (143 of 145 specimens) and the frontoparietal row is almost always complete (109 of 138 specimens). The largest male measures 79 mm in snout-vent length, the largest female 62 mm; the male is from Saltrou and the female from Gormand.

Brightly colored males of *L. p. aureus* attest to the complete appropriateness of the name. Although the dorsal ground color is quite variable, ranging from gray with paler gray to cream dorsolateral stripes to golden (Pl. 9K7, Maerz and Paul, 1950) with or without paler dorsolateral lines, the latter condition provides an extremely showy lizard. The sides and hindlimbs are brick-red to orange-red, spotted with cream in some males, and in others are tan to vivid orange-brown with scattered green to turquoise scales. The heads are tan to vivid orange-brown, often speckled with a few dark brown flecks. The lateral stripe is gray to reddish-brown and often inconspicuous against the coloration of the sides. The upper surface of the hindlimbs varies between brick-red and orange-red to rusty orange and has a few inconspicuous brownish flecks. The venter is dirty yellowish to orange (Pl. 9L10) and the green and turquoise scales from the sides extend ventrad as lines of individual scales onto the bright belly. The throat is white to gray, and the chin white. The throat pattern consists of black to gray smudges, either reticular or individual, but seldom arranged in any transverse linear pattern (if so, there are never four transverse bars) and in general not especially distinct against the grayish background. Often the throat pattern is much reduced and is limited to scattered dusky smudges, comparable to the throat pattern of some of the subspecies of *L. personatus* from the northern República Dominicana. The upperside of the tail is unicolor with that of the back, and thus may be gray to golden. Usually the tail is prominently chevronate only distally. The underside of the tail is light gray to orange.

Females are much less showy, with the dorsum sandy to dirty brownish-gray, and lacking completely the orange and reds of the males. The dorsolateral lines are buffy and conspicuous and the dorsal zone often has paramedian zones of chevron remnants. The tail is prominently chevronate above and orange below. The throat is white to pale gray with a slightly darker gray pattern which in its variation is precisely comparable to that of the males, although there may be as many as three weakly expressed gray bands behind the chin. The ventral color is very pale yellow to very pale greenish. The hindlimbs may have a slightly rusty tinge, but are usually brown with faint darker flecking.

Of the two specimens which I consider intergrades between *aureus* and *oxygaster*, one is a male (ASFS V2534) and the other a female (ASFS X9886). The male has a gray and vermiculate throat pattern, and a rusty-brown dorsal zone. The female has a black vermiculate throat pattern with a grayish-tan dorsum and a pale gray head. The two specimens are intermediate in intensity and configuration of throat pattern between *aureus* and *oxygaster*. Attention has already been called to the occurrence of golden specimens within the western position of the range of *oxygaster*, so that the zone of intergradation may be somewhat broader than these few specimens indicate. One of these two intergrades (ASFS V2534) has the unique count in *L. barahonensis* of 24 midbody scales.

The distribution of *L. b. aureus* extends from Jacmel in the west along the southeastern coast of Haiti to the town of Pedernales and its environs on the Dominico-Haitian border. In both countries, *aureus* extends into the southern portion of the Massif de la Selle and the Sierra de Baoruco, being known in the former from Marbial at an elevation of about 200 meters and in the latter from above Las Mercedes at an elevation of 1900 feet (623 meters).

There is a specimen (USNM 75916) of

aureus from the "Artibonite Valley"; this specimen was collected by J. S. C. Boswell, and once again the locality is surely incorrect. *L. barahonensis* is not known to occur north of the Cul de Sac Plain (although a related species does occur there); since Boswell collected the holotype of *L. b. aureus* and since this specimen is clearly that race rather than any other, I assume that the specimen was mislabeled in the past and probably originated near Jacmel or at least on the south coast.

At one locality (Marbial) *L. b. aureus* occurs with *L. melanochlorus*. The two are readily differentiable on the basis of the lateral fold and dorsal pattern of dark mottling in the former. Neither appears to be common at Marbial, and I suspect that the Marbial vicinity is at the upper altitudinal or ecological limits of the lowland *aureus* and at the lower limits of the (eastern) upland *melanochlorus*.

At least in the República Dominicana (and judging also from the quantity of Haitian specimens) *L. b. aureus* is quite common. It occurs primarily in wooded situations, such as shady *Acacia* stands and about the edges of cultivated and cleared areas, and shuns the more open hot and arid regions. Its occurrence in the foothills in more mesic surroundings indicates the predilection of *L. barahonensis* for less rigorous environments.

Specimens examined: Haiti, Dépt. de l'Ouest, Jacmel, 4 (MCZ 37535-38); Méyer, 4 (MCZ 65156-57, CM 37827-28); Marbial, 21 km NE Jacmel, 2 (MCZ 65155, CM 37826); one half way between Cayes Jacmel and Marigot, 1 (MCZ 57134); between Cayes Jacmel and Marigot (not mapped), 5 (AMNH 49756-60); Saltrou, 24 (MCZ 57145-46, AMNH 50011-32); Lan Banane, nr. Saltrou, 10 (MCZ 68597-601, CM 38527-31); Trou Roche, nr. Saltrou, 15 (MCZ 68587-96, CM 38522-26); Tête à l'Eau, nr. Saltrou, 17 (MCZ 68602-11, CM 38532-38); Gormand, nr. Saltrou (not mapped), 2 (MCZ 68612-13); Tean, nr. Saltrou (not mapped), 10 (MCZ 69393-402); "Artibonite Valley", 1 (USNM 75916); *República Dominicana, Pedernales Province,* Pedernales, 16 (ASFS V2552-63, V2664-66, V2805); 5 km N Pedernales, 2 (ASFS V2542-43); 1 km E Pedernales, 8 (ASFS X9754-60); 3 km E Pedernales, 10 (ASFS X9870-78, X9890); 4 km E Pedernales, 4 (ASFS V2508, MCZ 58034-36); 5 km E Pedernales, 3 (ASFS V2530-32); 5 km SE Pedernales, 4 (ASFS X9761-64); 6 km SE Pedernales, 6 (ASFS X9879-83, RT 750); 10 km SE Pedernales, 1 (ASFS V2533); 7 km S Las Mercedes, 1 (ASFS V2654); 4 km NE Las Mercedes, 1900 feet (623 meters), 1 (ASFS V2653). Intergrades between *L. b. aureus* and *L. b. oxygaster: República Dominicana, Pedernales Province,* 12 km SE Pedernales, 1 (ASFS V2534); 16 km SE Pedernales, 1 (ASFS X9886).

Leiocephalus barahonensis beatanus Noble, 1923

Leiocephalus beatanus Noble, 1923, Amer. Mus. Novitates, 64:5.

Type locality: Isla Beata, República Dominicana.

Holotype: AMNH 24330, an adult male, with a snout-vent length of 76 mm (*fide* Noble, *loc. cit.*).

Diagnosis: A subspecies of *L. barahonensis* characterized in males by a combination of a broad ashy-gray dorsal zone with a pair of paramedian and a median dark stripes, dorsolateral pale lines distinct and outlined medially by the paramedian dark stripes, throat light to dark gray with a pattern of five or six bold transverse bars (often incomplete medially) followed by a few black flecks on the chest (Fig. 11d), ventral ground color orange (sometimes greenish- or grayish-orange); frontoparietals usually 5.

Distribution: Isla Beata, República Dominicana (Fig. 6).

Variation and discussion: The series of 42 *L. b. beatanus* has the following scale counts: dorsal crest scales occiput-vent 43 - 54 (mean 48.8), dorsal crest scales occiput-axilla 13 - 20 (mean 16.9), dorsal crest scales on trunk 25 - 36 (mean 31.9), one half midbody scales 17 - 22 (mean 19.7), loreals 3 - 6 (mean 4.2), temporals 7 - 10 (mean 8.7), supraoculars 6/6 (39 specimens), 5/5 (1), 5/6 (1), 6/7 (2), 7/7 (8), semicircles usually incomplete (84.3 percent), and parietals always in contact (100 percent). The prefrontal row consists of 2 to 4 scales (mode 3), the

median head scales vary between 3 and 6 (mode 4), and the frontoparietal row has 2 to 7 scales (mode 5); the prefrontal row is always complete (53 specimens) and the frontoparietal row is more often complete (32 of 43 specimens). The largest male measures 80 mm snout-vent length, the largest female 64 mm.

Males are ashy-gray above with a pair of darker paramedian stripes and a dark middorsal stripe, as well as with a pair of pale dorsolateral stripes—the net effect being that of a dorsally striped or lined lizard. The sides below the dorsolateral lines are dark (charcoal to reddish) with scattered blue flecks, the blue flecking extending ventrad as isolated scales onto the belly. The lateral line is buff to reddish and the lower sides are greenish-gray to faintly reddish with a heavier concentration of blue scales. The venter and underside of hindlimbs and tail are usually orange, although occasional lizards have these areas greenish-orange or grayish-orange. The throats and chests are some shade of gray, usually rather dark, and the throat pattern consists of five or six bold black transverse bars, often incomplete medially, followed by a few scattered black or dark gray smudges on the chest. Occasional specimens have the bars somewhat fragmented, but nonetheless discernible. The heads are gray to brown, usually with some random darker brown markings. The hindlimbs are immaculate tannish-orange above, and the forelimbs are dull grayish-tan with some darker gray mottling.

The females are colored like the males dorsally but the longitudinal stripes are even more bold. The ground color of the throat is pale gray and the throat pattern is comparable to that of the males, although there is a distinct tendency toward fragmentation of the bars and subsequent formation of a reticulum, especially posteriorly. The venter is usually greenish to grayish-white and lacks the brighter shades of orange.

Juvenile males are patterned like the females and are boldly lineate above.

The dorsal striped pattern of *beatanus* will distinguish the insular subspecies from all other races; occasional males from the mainland are striped dorsally, but never so boldly as *beatanus*. The throat pattern of *beatanus* differs widely from that of *barahonensis* and *aureus* and most closely resembles that of *oxygaster*. In the latter the throat pattern consists of three or four transverse bars followed by a rather large area of dark smudges and may even be reticular, whereas in *beatanus* there are five or six bold bars with less posterior area devoted to smudges. The striped dorsal pattern (which occurs occasionally in *oxygaster*) will also separate *beatanus*. In having a mode of 4 frontoparietals *oxygaster* differs from *beatanus* with a mode of 5; in *beatanus* there are 17 specimens with 5 frontoparietals (the modal class) and 16 with 4 frontoparietals, so that the modality of 5 is almost equalled by a modality of 4.

Judging from the number of specimens available, *L. b. beatanus* is quite common in Isla Beata. *L. b. beatanus* occurs in open areas on the limestone platform on Beata, both on exposed limestone and in stands of a small arborescent cactus. Its closest affinities are obviously with *oxygaster* of the adjacent mainland, these two subspecies being the only two with distinct throat barring. The prominently striped dorsum and different coloration details of *beatanus* are characteristic of the insular subspecies.

Specimens examined: República Dominicana, Isla Beata, 57 (ASFS V2723-42, MCZ 17737—paratype, 33382, 28726-40 + two untagged, 37539-50 + three untagged; RT 933).

Leiocephalus vinculum Cochran, 1928

Leiocephalus vinculum Cochran, 1928, Proc. Biol. Soc. Washington, 41:54 (type locality—Pointe à Raquettes, Ile de la Gonâve, Haiti).

Definition: A species of *Leiocephalus* characterized by a combination of 1) moderate size (males to 77 mm, females to 73 mm snout-vent length), 2) sexual dichromatism not pronounced dorsally but throat pattern dichromatic in one subspecies, and males with a pair of enlarged postanal scales, 3) absence of a lateral fold, 4) dorsal scales imbricate, denticulate, and keeled, ventral scales imbricate, smooth, and weakly to strongly denticulate, 5) median dorsal crest scales slightly enlarged, not attenuate, slightly imbricate (Fig 9b and c), lower than median dorsal caudal scales, 51 to 65

in occiput to vent distance, 6) one half midbody scales 18 to 28, 7) supraoculars usually 6/6, 8) loreals 3 - 7, 9) temporals 8 - 13, 10) supraorbital semicircles most often complete, 11) parietals always in contact, 12) median head scales varying between 3 and 7, 13) preauricular scale small (Fig 2a), 14) throat in one or both sexes black, or with a pair of paramedian dark longitudinal lines, 15) ventral color yellow, 16) ventral pattern absent in both sexes, 17) mask absent, and 18) black neck and shoulder patches absent.

Leiocephalus vinculum vinculum
Cochran, 1928

Type locality: Pointe à Raquettes, Ile de la Gonâve, Haiti.

Holotype: MCZ 25435, an adult female, with a snout-vent length of 66 mm.

Diagnosis: A subspecies of *L. vinculum* characterized in males by a tan to metallic tan dorsum with prominent dorsolateral buffy stripes, the dorsal zone with a vague pair of paramedian dark stripes which enclose about twelve chevron arm remnants on each side, throat clouded yellowish-gray with a dark gray to black pattern consisting of a pair of paramedian dark lines preceded by one or two dark transverse bars and bordered laterally by parallel lines or line remnants (Figs. 10b, 12a), ventral ground color pale yellow; size large (males to 77 mm, females to 73 mm snout-vent length), frontoparietals modally 5.

Distribution: Ile de la Gonâve, Haiti (Fig. 6).

Variation and discussion: The series of 45 *L. v. vinculum* has the following scale counts: dorsal crest scales occiput-vent 51 - 60 (mean 55.8), dorsal crest scales occiput-axilla 15 - 24 (mean 18.6), dorsal crest scales on trunk 32 - 41 (mean 37.0), one half midbody scales 18 - 24 (mean 20.5), subdigital fourth toe tricarinate scales 21 - 26 (mean 23.3), loreals 3 - 7 (mean 4.8), temporals 8 - 12 (mean 9.8), supraoculars 6/6 (49 specimens), 5/6 (1), 6/7 (1), semicircles usually complete (68.6 percent) and parietals always in contact (100 per cent). The prefrontal row consists of 2 to 5 scales (mode 3), the median head shields vary between 3 and 7 scales (mode 4) and the frontoparietal row has 2 to 5 scales (mode 5); the prefrontal row is always complete (53 specimens), and the frontoparietal row is usually complete (40 of 52 specimens). Although presence of 3 prefrontals is distinctly modal (33 lizards), the high incidence of 2 prefrontals (19 lizards) is noteworthy. The largest male measures 77 mm snout-vent length, the largest female 73 mm (and is the largest female of any member of the *L. personatus* complex); the male is from Etroits, and the female from Ti Palmiste.

The males have a tan to metallic tan broad dorsal zone bounded by a pair of prominent buffy dorsolateral stripes. The dorsal zone also includes a pair of darker paramedian stripes with a series of about twelve darker areas which, upon comparison with the females, are shown to be the remnants of the arms of the chevrons. The head is tan with occasional dark suffusions and dark dots. The neck may have as many as three complete chevrons but these are not black or outstanding as are the nuchal and scapular bars of some races of *L. personatus*. The sides are darker brown than the back with scattered clear yellow (not green, blue, turquoise, brick, or orange) scales. The throat is pale yellow, much clouded with gray, and the venter is also pale yellow. The throat pattern consists of gray to black markings, including a pair of paramedian longitudinal lines which do not extend onto the chest, preceded by one or two fainter dark transverse bars and bordered laterally either by two more longitudinal lines or remnants thereof. The chest is usually gray with some darker gray spots and yellow scales admixed. The yellow scales on the sides of the body extend onto the venter in irregular rows but remain distinct despite the pale yellow ventral ground color. The underside of the hindlimbs is heavily mottled with clear yellow scales. The tail is tan above and weakly chevronate, and is pale clear orange below. There is a deep orange suffusion on the sides of males in the region of the groin. The hindlimbs are brownish dorsally with some yellow flecks; the forelimbs are tan above with vague darker mottling.

Females are colored above like the males, but lack the metallic sheen. The dorsolateral stripes are moderately prominent and

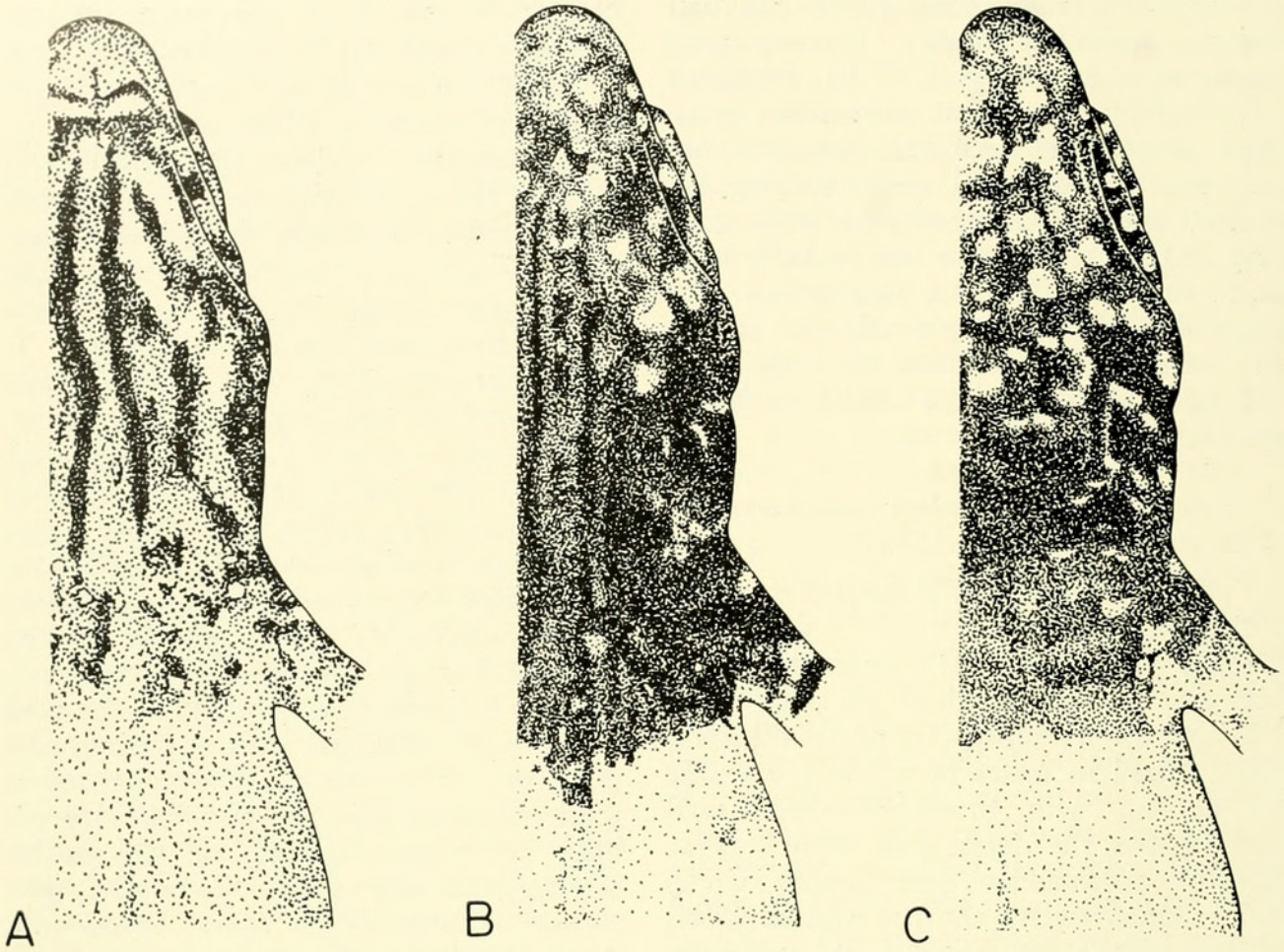

Figure 12. Ventral view of throat of males of three subspecies of *L. vinculum*, as follows: a) *L. v. vinculum*, ASFS X2491, 1.5 mi. S Etroits, Ile de la Gonâve, Haiti; b) *L. v. endomychus*, MCZ 81099, holotype, 3.4 mi. NE Barrage de Péligre, Dépt. de l'Ouest, Haiti; c) *L. v. altavelensis*, MCZ 79374, Isla Alto Velo, República Dominicana.

the dorsal zone includes two paramedian dark stripes which contain about twelve chevron tips. The median dorsal zone has the remainder of the chevrons strongly to weakly indicated, so that the net effect is one of a herringboned or transversely banded lizard. The throat is pale gray and the pattern is comparable to that of the males; the paramedian throat lines may be preceded by two or three dark transverse bars and bordered laterally by about three diagonal lines (pointed anteromedially) or their remnants. The throat pattern is most distinct in young females, and these smaller specimens (and an occasional subadult) have some gray flecking extending onto the anterior and lateral portions of the abdomen. The lateral line between the limbs, which is absent in adults of both sexes, is only very weakly indicated in young females. The sides of young females may have some indications of lateral longitudinal dark dashes, but this is not the rule.

The single juvenile male with a snout-vent length of 42 mm is colored and patterned like the young females, and has some gray chest and lateral abdominal streaking.

L. v. vinculum is the only species of the genus known from Ile de la Gonâve. It is widespread on the island, occurring from Pointe Ouest (Cochran, 1941:238) in the north to the southern portion of the island at Pointe à Raquettes. Near Etroits, the lizards were abundant on the rocky hillside at the foot of the hills which form the central Gonâve uplands. The flora here was xeric scrub with some large shade trees. The lizards were sunning on rocks in the early afternoon (1300 hours) and had not been seen between 1100 hours and that time.

Specimens examined: Haiti, Ile de la Gonâve, 1.5 mi. (2.4 km) S Etroits, 15 (ASFS X2491-505); Pointe à Raquettes, 2 (MCZ 25435 — holotype, MCZ 25437 — paratype); Ti Palmiste, 6 km from Pointe à

Raquettes, 31 (MCZ 80769-99); Nan Café, 5 (MCZ 61059-63).

Leiocephalus vinculum **endomychus,** new subspecies

Holotype: MCZ 81099, an adult male, from 3.4 mi. (5.5 km) NE Barrage de Péligre, 1100 feet (361 meters), Dépt. de l'Ouest, Haiti, one of two taken 11 July 1962 by David C. Leber and Albert Schwartz. Original number X2215.

Paratype: ASFS X2216, same data as holotype.

Associated specimen: Haiti, Dépt. de l'Artibonite, Hinche, 1 (MCZ 25431).

Diagnosis: A subspecies of *L. vinculum* characterized in males by a combination of a pale greenish-tan dorsal zone without dorsolateral stripes, the dorsal zone crossed by a series of about twelve grayish herringbones, throat and chest solid black with scattered green scales on chin and throat, the black pigment extending dorsally onto the sides of the neck and onto the anterior surface of the forelimbs (Figs. 10c and 12b), ventral ground color yellow; size moderate (male 69 mm, female 59 mm snout-vent length), frontoparietals 4.

Distribution: Known only from the type locality in central Haiti and very questionably from Hinche to the north of the type locality (Fig. 6).

Description of holotype: An adult male with the following measurements and counts: snout-vent length 69 mm, tail 79 mm, distal two-thirds regenerated; dorsal crest scales occiput-vent 57, dorsal crest scales occiput-axilla 19, dorsal crest scales on trunk 38, one half midbody scales 21, subdigital fourth toe tricarinate scales 21/-, loreals 4, temporals 10, enlarged auriculars 4/3; 3 prefrontal scales, row complete; 4 median head shields; 4 frontoparietal scales, row complete; supraoculars 6/6; supraorbital semicircles complete, parietal scales in contact.

Dorsal ground color greenish-tan with no indication of dorsolateral stripes or lines; a series of about twelve grayish herringbones separated by pale greenish scales, the entire back having a distinctly transversely banded or herringbone pattern. Sides grayish-tan with scattered green scales, lateral line between limbs absent. Head tan above. Throat and chest black (slightly less intense on anterior two-thirds of throat) with scattered green scales on throat; black throat pigment extending dorsally onto the sides of the neck and onto the anterior aspect of the brachia. Hindlimbs greenish above, marbled with gray; forelimbs gray marbled with darker gray above. Tail (unregenerated portion) grayish with vague darker gray chevrons. Venter yellow with irregular lines of green scales extending ventromedially from sides. Underside of tail yellow.

Variation: The paratype is an adult female with a snout-vent length of 59 mm, dorsal crest scales occiput-vent 65, dorsal crest scales occiput-axilla 19, dorsal crest scales on trunk 46, one half midbody scales 23, subdigital fourth toe tricarinate scales 20/20, loreals 5, temporals 13, supraoculars 6/6, semicircles complete, parietals in contact; 2 prefrontals, row complete; 4 median head shields; 4 frontoparietals, row complete.

The female is dull brown above with about fourteen dull brownish transverse bars or herringbones. In details of pattern the female resembles the male, lacking a lateral line and with very pale greenish scales extending from the sides onto the venter. The throat is very dark but allows the appearance of a pair of longitudinal paramedian lines bordered by a dark gray reticular area on each side. The venter and the underside of the tail are yellowish-green. The tail is brown with distinct chevrons above. Both fore- and hindlimbs are brown, marbled with paler brown or tan.

Comparisons: Male *L. v. endomychus* can be easily differentiated from male *L. v. vinculum* by the black throat with scattered green scales of the former versus a patterned throat in the latter. The tan dorsa of *vinculum* with their prominent dorsolateral stripes contrast with the transversely barred and greenish dorsum without longitudinal stripes in *endomychus.* Females are similar, but the throat of the single female *endomychus* is much darker than that of any of the many female *vinculum,* and the pattern is reminiscent but less prominent. Apparently, *endomychus* has a higher number of dorsal scales in occiput to vent and a

greater number of temporals; these differences need confirmation by additional specimens. The modal number of 5 median head shields in *vinculum* contrasts with the mode of 4 in *endomychus*.

Remarks: The type and topoparatype of *L. v. endomychus* were collected on the hillside above the lake formed by the Barrage de Péligre. The male was taken on the rocky wall of a roadcut, and the female was secured in a shady cavity in the same roadcut about 3.5 meters above the road. The general area was mesic but sunny and exposed. No other lizards were observed.

The associated specimen (MCZ 25431) is from Hinche, which lies about 28 kilometers directly north of the type locality. I associate this lizard with *endomychus* only extremely tentatively. It is an adult male with a snout-vent length of 73 mm and is thus larger than the type. The specimen is presently discolored and shows only the very vaguest dorsal pattern, which includes prominent dorsolateral stripes. The throat, although dark, is not black and has a pattern of a pair of paramedian dark lines bordered by areas of dark smudges and longitudinal dashes. The specimen is clearly *L. vinculum*, but it does not agree in pattern with the very distinctive specimens from Péligre. It has 56 dorsals in occiput-vent distance (thus just one scale below the lowest count of *endomychus* and not significant), but has extremely high fourth toe counts of 28 and 27—much higher than the counts of 20 and 21 in the two *endomychus*. Hinche lies on the Plateau Central, and the type locality of *endomychus* is on the southern slopes of the Montagnes Noires; conceivably there is another subspecies of *L. vinculum* on the Plateau.

Although no other species of *Leiocephalus* is known from the region of the type locality, it is noteworthy that *L. personatus scalaris* occurs nearby both in Haiti (at Cerca-la-Source, 40 kilometers northeast) and in the República Dominicana (Bánica, 40 kilometers east-northeast). These localities are even closer to Hinche. If the two species occur together in this region, they can easily be distinguished by the attenuate crest scales and practically unpatterned throat of *scalaris* in contrast to the non-attenuate scales and dark or lined throats of *L. vinculum*.

Leiocephalus vinculum altavelensis Noble and Hassler, 1933

Leiocephalus altavelensis Noble and Hassler, 1933, Amer. Mus. Novitates, 652:14.

Type locality: Isla Alto Velo, República Dominicana.

Holotype: AMNH 51055, an adult male, with a snout-vent length of 60 mm (*fide* Noble and Hassler, *op. cit.*:15).

Diagnosis: A subspecies of *L. vinculum* characterized in males by a combination of a yellowish-brown dorsal zone not outlined by dorsolateral stripes and usually with a series of about twelve transverse bands giving a faintly crossbarred or herringbone effect, throat and chest dark blue-gray spotted with white (Fig. 12c), ventral ground color yellowish; size moderate (males to 71 mm, females to 63 mm snout-vent length), frontoparietals modally 5.

Distribution: Isla Alto Velo, República Dominicana (Fig. 6).

Variation and discussion: The series of 21 *L. v. altavelensis* has the following scale counts: dorsal crest scales occiput-vent 54 - 61 (mean 57.2), dorsal crest scales occiput-axilla 15 - 23 (mean 19.6), dorsal crest scales on trunk 31 - 43 (mean 37.7), one half midbody scales 23 - 28 (mean 25.5), subdigital fourth toe tricarinate scales 24 - 29 (mean 26.3), loreals 3 - 5 (mean 3.7), temporals 9 - 13 (mean 10.8), supraoculars 6/6 (15 specimens), 6/7 (5), 7/7 (3), 7/8 (1), 6/8 (1), 9/10 (1), semicircles equally divided between incomplete and complete, and parietals always in contact (100 percent). The prefrontal row always consists of 3 scales (26 specimens), the median head shields are 3 to 5 (mode 4), and the frontoparietal row has 3 to 6 scales (mode 5); both the prefrontal and frontoparietal rows are always complete. The largest male has a snout-vent length of 71 mm, the largest female 63 mm.

L. v. altavelensis is one of the two members of the *personatus* complex which I have not seen in life, and this is especially unfortunate, since *altavelensis* is certainly the most puzzling lizard of the group. Fortunately, Noble and Hassler (*op. cit.*:16)

have given some information on the coloration of this form in life, and I have drawn on their notes. The dorsum is yellowish-brown, without dorsolateral longitudinal pale lines, and with a golden-bronze sheen. The dorsal pattern is variable, since these authors stated that the males lacked any dorsal pattern except for one lizard that, prior to shedding, showed faint cross-lines which became indistinct after shedding. Of the six males before me, only one (AMNH 51054, the largest male known) lacks dorsal crossbars, and this lizard is presently badly worn. A slightly smaller male (AMNH 51060, snout-vent length 66 mm) clearly shows the bars or at least their remnants. It is possible that large males lose these crossbars, but even this is not certain since so few male *altavelensis* are known. The legs are darker than the back and have light spots, but no barring. The tail is light yellowish-brown above with faint chevrons. The sides are greenish with scattered metallic green scales. The throat is dark bronzy brownish-black with small white spots which are at times confluent. The venter is yellowish with sometimes a slightly green tint.

Noble and Hassler noted that there was no sexual dichromatism, and there appears to be none in pattern (and probably also in coloration) in the specimens before me. The females are all distinctly crossbarred dorsally, and all have the throat pattern like that of the males. The dorsally spotted head of both sexes is a very distinctive feature of *altavelensis*.

L. v. altavelensis is said to be common on Alto Velo, "living among rocks, leaves and grass along the coast and ranging to the top of the higher ridge in the center of the island" (Noble and Hassler, *loc. cit.*).

I have debated the affiliation of *altavelensis* since I first examined the specimens. Its closest geographic relative (on Isla Beata, which lies to the northeast of Alto Velo and is separated by a channel 12 kilometers in width) is *L. b. beatanus*. These two forms are extremely different in pattern and size, with *altavelensis* smaller, transversely barred dorsally, and with virtually black throats, and *beatanus* large and stocky, longitudinally lined dorsally, and with transversely barred throats.

The most trenchant scale difference between *L. barahonensis* and *L. vinculum* is the presence in the former of the enlarged preauricular scale. In this character, *altavelensis* clearly is like *vinculum*. *L. barahonensis* is more strongly dimorphic (males to 80 mm, females to 64 mm) than is *vinculum* (males to 77 mm, females to 73 mm). *Altavelensis* is intermediate between these two extremes, but the difference (males to 71 mm, females to 63 mm) is more like that of *vinculum* than *barahonensis*. The dorsal pattern of *altavelensis* is transversely oriented, which is the case also in *vinculum*, but not in *barahonensis*, where the pattern is longitudinally oriented. The yellow venter of *altavelensis* is like that of *vinculum* and different from the very vivid colors (yellow-orange and orange) of *barahonensis*.

In most scale counts (but especially in the three dorsal counts, midbody scales, and number of temporals), *altavelensis* agrees with *vinculum* and *endomychus*. The most obvious exceptions to this are counts of fourth toe scales (which are higher in *altavelensis* than both *barahonensis* and *vinculum*) and loreals (which are less in *altavelensis* than in *vinculum* or *endomychus*, and in fact lower also than any subspecies of *barahonensis*). In extremes of the three dorsal scale counts and temporals, *altavelensis* is like *vinculum*, and only in fourth toe scales are the extremes of *altavelensis* like those of *barahonensis*.

The dark throats of both sexes of *altavelensis* with their scattered white scales are very reminiscent of the dark throat with scattered green scales of *endomychus*. In the latter subspecies, females still show the longitudinal orientation of the throat lines, a feature of *L. v. vinculum*. At least young female *altavelensis* have the throats dark as do adults of both sexes, and there is no evidence from this source as to the basic throat pattern of *altavelensis*. Finally the condition of the supraorbital semicircles might be a useful clue, but the precise division of the available specimens into half with complete semicircles and half with them incomplete precludes any useful information from this character.

There are three interpretations of *altavelensis*: 1) *altavelensis* is an extremely

aberrant subspecies of *L. barahonensis,* both scutellogically and chromatically different from its parent stock; 2) *altavelensis* is a separate species (in which event, the sole character which might distinguish it from both *L. barahonensis* and *L. vinculum* is the black throat in *both* sexes; 3) *altavelensis,* despite its peculiar geographic position, is a subspecies of *L. vinculum.* Another alternative is that *L. barahonensis* and *L. vinculum* are conspecific, and that *altavelensis* in some ways bridges the gap between these two forms. I reject this latter interpretation as unsatisfactory. If *altavelensis* is not to be regarded as a race of *L. vinculum,* then it must be considered a separate species, and not as a subspecies of *L. barahonensis.* To include it in the latter weakens the diagnosis and concept of *L. barahonensis,* thereby obscuring the distinctive scale and chromatic characters of this southern species.

L. v. altavelensis may be differentiated from *L. v. vinculum* by its yellow-brown dorsal coloration and very dark throat without longitudinal lines. From *L. v. endomychus, altavelensis* differs in brown rather than green dorsum and in having black-throated females. Of the two northern races, *altavelensis* seems closer to *endomychus* than *vinculum.*

Specimens examined: República Dominicana, Isla Alto Velo, 26 (AMNH 51051-54, 51056-68, 51070-71—paratypes; MCZ 43950-51—paratypes; MCZ 79373-77).

Leiocephalus eremitus Cope, 1868

Liocephalus eremitus Cope, 1868, Proc. Acad. Nat. Sci. Philadelphia, 20:122.

Mertens (*op. cit.*:10), in discussing the affinities of the Navassan fauna with that of Hispaniola and Cuba, suggested the relationship of *L. eremitus* with *L. personatus.* Such a relationship is not unwarranted, since the Navassan fauna has several elements which are allied to Hispaniolan species. There are but two specimens of *eremitus* known, the holotype (USNM 12016) and a referred juvenile individual (AMNH 16919). The latter in actuality is not conspecific and was presumably collected in Haiti (see Thomas, 1966, and Schwartz, 1966), and represents the western subspecies of *Leiocephalus melanochlorus.* Thus, comments upon the status of *eremitus* perforce must be based upon only the holotype; the species is presently presumed to be extinct.

The holotype is a large female, with a snout-vent length of 64 mm. The counts are: dorsal crest scales occiput-vent 50, dorsal crest scales occiput-axilla 16, dorsal crest scales on trunk 34, one half midbody scales 21, subdigital fourth toe tricarinate scales 27/28, loreals 6/7, temporals 13, supraoculars 7/7, semicircles incomplete, parietals in contact; 5 prefrontals, row complete; 7 median head shields; 5 frontoparietals, row incomplete. The dorsum now is gray with about nine transverse bands with paler posterior edges, not uniform in width, narrower toward the midline, and somewhat staggered. The venter is extremely dark brown with many light-tipped scales; the chest and throat are similar to the abdomen and there is no obvious throat pattern.

The most salient structural character of *L. eremitus* is the comb-scales which lie on the outer edges of toes 1 and 2. These scales in *eremitus* are multicarinate, and not unicarinate and cuneiform as they are in all other living West Indian members of the genus.

The peculiar head scalation (with a formula of 5-7-5) and the structure of the comb-scales, as well as the "aberrant" ventral coloration and pattern, all attest to the distinctness of *L. eremitus.* I see no valid reason to associate it with any members of the *personatus* complex (although the dorsal pattern is reminiscent of that of *L. vinculum*), nor for that matter with any other West Indian species. Apparently *L. eremitus* was a very distinctive Navassan endemic which is presently extinct.

The following table summarizes salient features of the four species of the *Leiocephalus personatus* complex described in this paper.

Discussion

In the foregoing account, the species *Leiocephalus personatus* has been shown to be divisible into four species—*personatus, lunatus, barahonensis,* and *vinculum.* Although each species has in combination both scale and pattern coloration characteristics which distinguish it from each of the others,

Table 1. Chart showing mensural, chromatic and scale characters of the four species of *Leiocephalus* in the *personatus* complex.

	L. barahonensis	*L. vinculum*	*L. personatus*	*L. lunatus*
Maximum size ♂	80	77	86	67
♀	64	73	63	60
Supraorbital semicircles	usually incomplete	usually complete	usually complete	usually complete
Preauricular scale	very large	small	small	small
Dorsal crest scales (♂'s)	not attenuate	not attenuate	attenuate	attenuate
Throat pattern ♂	bold black reticulate or transversely barred	very dark to solid black, usually with longitudinal lines	solid black to no pattern except a few diffuse dots	heavy discrete dots
♀	dark gray reticulate or transversely barred	very dark	heavy dots	faint gray dots
Ventral color	orange	yellow	green to yellow	pale yellowish to tan or lavender
Ventral pattern				
♂	none	none	none	none
♀	none	none	dots	none
Face mask	absent	absent	present, bold	absent
Neck blotch	absent	absent	absent	present
Dorsal crest scales (occiput-vent)	42 - 57	51 - 65	41 - 64	50 - 68
Dorsal crest scales (occiput-axilla)	12 - 22	15 - 24	13 - 27	16 - 27
Dorsal crest scales (trunk)	25 - 40	32 - 46	22 - 44	32 - 46
One half midbody scales	16 - 24	18 - 28	18 - 28	19 - 27
Fourth toe scales	19 - 29	20 - 28	18 - 27	20 - 27
Loreals	2 - 8	3 - 7	2 - 10	2 - 8
Temporals	7 - 11	8 - 13	7 - 14	7 - 14

there are two pairs of species involved—*personatus* and *lunatus*, and *barahonensis* and *vinculum*. The character of the dorsal crest scales (attenuate in the first species pair, not attenuate in the second) seems a basic difference. The differences between the species *personatus* and *lunatus* seem to me greater in degree than the differences between *barahonensis* and *vinculum*, although the large versus small preauricular scale in this latter pair is significant. There is no reason to combine *personatus* and *lunatus*, since there is no evidence of intergradation between them, both maintaining their distinctness where they occur sympatrically. On the other hand, it might be proper to combine *barahonensis* and *vinculum*, especially because of the occurrence of *altavelensis* so far removed from its relatives to the north. However, if *barahonensis* and *vinculum* are combined, we unite two forms which differ strongly in size of the preauricular scale, completeness of the supraorbital semicircles (complete in *vinculum*, incomplete in *barahonensis*), basic dorsal pattern (zonate or lined in *barahonensis*, transversely barred in *vinculum*), and throat pattern (longitudinally lined or solid black in *vinculum*, transversely barred or reticular in *barahonensis*). There

seems no reason at present to weaken the definition of either of these species by including the other.

Of the four species, two are clearly north island (*sensu* Williams, 1961) forms—*personatus* and *lunatus*. The occurrence of *personatus* on the northern coast of the south island suggests that *personatus* has invaded this region from the north and has been prevented further access to the south by the high ranges of the La Hotte and La Selle (although it has apparently been able somewhere to cross to Aquin in the south). There is presently a large gap between the range of the Tiburon subspecies (*personatus*) and that subspecies closest on the south shore of the north island (*trujilloensis*); this gap is partly closed by specimens from the *north* slope of the Sierra de Neiba, although these Sierra de Neiba populations are not in a direct line, either geographically or as far as relationships are concerned, with either *personatus* or *trujilloensis*, their affinities being with *agraulus* in the Cordillera Central. Much of the area between *personatus* and *trujilloensis* today is inhospitable as far as these lizards are concerned, being the very arid Cul de Sac-Valle de Neiba plain (which in actuality is a fossil strait formerly separating the north and south islands) and the almost equally dry Llanos de Azua. These xeric regions are in general not suitable for *L. personatus* and are today occupied by two other species of *Leiocephalus, semilineatus* and *schreibersi*.

Possibly the two specimens of *L. personatus* from St. Marc are pertinent; these specimens (unassignable to subspecies) may represent an *L. personatus* population which once (and perhaps even today) extended along the southern shore of the north island and from which *L. p. personatus* was derived. Collecting in the coastal strip between Port-au-Prince and St. Marc has not revealed *L. personatus*, but this is negative evidence at best. In any event, it seems likely that the range of *L. personatus* on the north island was once more extensive than it is today, and that the species has retracted from some areas where it formerly occurred.

The origin and distribution of *L. lunatus* is difficult to explain. No living population of *L. personatus* approaches *L. lunatus* in details of pattern and coloration. Its nearest geographical *personatus* races (*trujilloensis, mentalis, tarachodes*) are all so distinctly different that none can logically be invoked as ancestral to *L. lunatus*. The occurrence of a subspecies of *L. lunatus* on Isla Saona and the occurrence of three mainland subspecies in a relatively restricted area indicate that *L. lunatus* has been in residence here for some time. I consider *L. lunatus* the resident of this southeastern coastal region, and *L. p. trujilloensis* as the invader from the west. Once again, as in *Ameiva lineolata* and two subspecies of *Ameiva chrysolaema, trujilloensis* stops abruptly at about the region of Baní, where the dry Llanos de Azua merge with the more mesic eastern coastal plain. It seems possible that a *trujilloensis*-like lizard formerly inhabited areas farther to the west along the coast of the north island, and has since become increasingly restricted eastward with climatic and vegetational changes in the Llanos de Azua. Perhaps *L. lunatus* was the resident species of these southeastern mesic regions whose distribution has been compressed both by climatic change and invasion by *trujilloensis*, although the latter has apparently not been overly successful.

The northern subspecies of *L. personatus* (*scalaris, actites, tarachodes*, and, since it intergrades with *tarachodes, mentalis*) form a group of races which are obviously related. Of them, *mentalis* is the most distinct. I consider that these subspecies represent one center of differentiation and dispersal, probably from an area in or about the Valle de Cibao. Of all the races of *L. personatus*, only *scalaris* tolerates extremely xeric conditions, although in this dry macrosituation it inhabits more shady microsituations. I consider that *tarachodes* was derived from *scalaris* (and further that *mentalis* is a *tarachodes* derivative) and that *actites* evolved by a northwestward coastal movement from *tarachodes*, rather than across the Cordillera Septentrional from *scalaris*.

It seems logical to consider *budeni* a derivative of *scalaris* (since it is close to *scalaris* geographically) and *agraulus* a derivative of *budeni*. I doubt that this is the true situation, since *budeni* differs radically from both its neighbors in coloration and shows no special relationships to either, although it appears closer to *scalaris*. Both

budeni and *agraulus* have surely had long and independent histories; the latter has presumably evolved in the high Cordillera Central and the former in the pine-clad northeastern slope of this same range.

L. barahonensis is completely restricted to the eastern end of the south island; it occurs on Isla Beata also. There is no evidence that *barahonensis* and *vinculum* are conspecific. I do not know what prevents *barahonensis* from extending west of Jacmel, and perhaps it does. It is not known to occur in the Les Cayes-Cavaillon region which is occupied by *L. melanochlorus*. Along the north slope of the Sierra de Baoruco, *L. barahonensis* occurs very near to the Dominico-Haitian border, and should certainly be looked for along the southern border of the Cul de Sac Plain in Haiti. I have no doubt that *L. barahonensis* occupied at least the eastern portion of the south shore of the inter-island strait. Differentiation of *L. barahonensis* into three subspecies on the Península de Barahona in response to local geographic and edaphic conditions has already been discussed. Why *aureus* and *oxygaster* meet and intergrade in the precise area they do is unknown. There is no obvious physiographic reason to single out this region as a dividing line between the two subspecies, but nonetheless it is. *L. b. beatanus* is a direct derivative of *L. b. oxygaster* and colonization of Beata from the adjacent mainland can easily account for the similarity of these two races.

Of the four species, only *L. vinculum* presents a real problem of distribution. Occurring on two islands, one to the north of and the other to the south of the south island, and in the interior of Haiti as well, *vinculum* has a most peculiar disjunct distribution. I regard *vinculum* as the earlier and sequential forerunner of *barahonensis*, which was previously more widespread on the south island and which thence migrated to the north island across the inter-island channel. Once on the more northern land mass, *vinculum* occupied the central interior portion of Haiti. Although there is no evidence either pro or con, I suspect that at one time (and probably today) *vinculum* was the dominant *Leiocephalus* of this complex in the poorly known interior of Haiti; it may also have occurred in favorable localities along the shores of the Golfe de la Gonâve. From this mainland center, *L. vinculum* reached Gonâve and there developed the distinctive *L. v. vinculum*. On the south island, *L. vinculum* had reached Alto Velo, but not Beata; the absence of the species on Beata is fortuitous.

Meanwhile, on the south island, *L. barahonensis* evolved from a *vinculum*-like ancestor; I can suggest no other region for the origin of *barahonensis* than the Península de Barahona. Since today *L. barahonensis* prefers more shady and mesic situations and occurs at least in the forested foothills of both the Massif de la Selle and the Sierra de Baoruco, it is possible that primitively *barahonensis* was an upland (versus *vinculum* as a lowland) species. Whatever the situation, *barahonensis* gradually expanded its range and forced out *L. vinculum* from the Barahona, and invaded Isla Beata. Again fortuitously, *L. barahonensis* has not succeeded in crossing the strait between Beata and Alto Velo, and on this latter islet *L. vinculum* has been able to persist. If the above postulated history of these two species on the south island is reasonable, one might expect that there are residual *L. vinculum* populations on the Península de Barahona—something which has yet to be demonstrated. However, there may well be no colonies of *L. vinculum* in this region due to the success of *L. barahonensis*. On the other hand, the extreme southern portion of the Barahona is still unknown herpetologically, and possibly relict *L. vinculum* may be encountered there.

Hispaniola has the richest *Leiocephalus* fauna of the West Indies. There are now recognized eight living Hispaniolan species (*semilineatus, pratensis, schreibersi,* and *melanochlorus,* in addition to the four in the *personatus* complex). A key to the eight Hispaniolan species is presented below. There is also an extinct species (*L. apertosulcus* Etheridge) known from the north island. Cuba stands second with diversity of members of the genus, with five species (*carinatus, raviceps, macropus, cubensis, stictigaster*). Five species occur in the Bahama Islands (*carinatus, loxogrammus, greenwayi, psammodromus, inaguae*) of which two are obviously related to Cuban (*carinatus, lox-*

ogrammus) and one *(inaguae)* to Hispaniolan species. (Etheridge, 1964:55, regards *punctatus* in the Bahamas as an additional Bahaman species). There are two recently extinct species, *eremitus* on Navassa and *herminieri* on Martinique, and three fossil species, *cuneus* from Barbuda, *apertosulcus* from Hispaniola, and *jamaicensis* from Jamaica have been described. There are *Leiocephalus* on all of the Cayman Islands *(carinatus)* and the genus is known fossil from Florida (Etheridge, *op. cit.*:57).

From the above summary of the known distribution of the species of *Leiocephalus*, it is clear that Hispaniola has been the primary center of differentiation of *Leiocephalus* in the Antilles. The variety of coloration, pattern, size, structural and scale characteristics of the Hispaniolan forms easily exceeds the lesser diversity of the Cuban species. Between the Cuban and Hispaniolan species, there are no clear-cut indicators of relationships. Each island must have had one or several early independent invasions, with subsequent differentiation *in situ*. The much greater topographic and historical complexity of Hispaniola versus Cuba has contributed to the complexity of the interrelationships of the Hispaniolan species.

The following key will serve to identify Hispaniolan species of *Leiocephalus*. In a third part of my studies on *Leiocephalus* additional races will be described. Until that time a key to the subspecies would be premature.

Key to the Hispaniolan species of *Leiocephalus*

1. a) Lateral folds with conspicuously smaller scales present 2
   b) Lateral folds absent 3

2. a) Size large (♂♂ to 130 mm, ♀♀ to 102 mm snout-vent length); dorsal scales 37 to 53 in occiput-vent distance; supraoculars usually 6/6; dorsal pattern not distinctly sexually dichromatic, consisting (by subspecies) of either 9 to 11 dark velvety crossbands or faint, fragmented or obsolete crossbands; throat reticulated or very dark and without pattern in both sexes ..... *L. melanochlorus*
   b) Size moderate (♂♂ to 107 mm, ♀♀ to 75 mm snout-vent length); dorsal scales 63 to 87 in occiput-vent distance; supraoculars usually 7/7; dorsal pattern distinctly sexually dichromatic, ♂♂ (by subspecies) pale sandy to tan sprinkled with pale dots or with a median dark brown band, ♀♀ with a series of about 8 transverse grayish bars and often with a black to gray axillary spot; throat in males grayish to purplish with scattered clear pale blue to green scales, in females streaked or clouded with darker gray ..... *L. schreibersi*

3. a) No regular row of middorsal scales; frontoparietal row almost always complete, preauricular scale not enlarged; dorsal pattern and hindlimbs prominently lined longitudinally; size small (♂♂ to 64 mm, ♀♀ to 55 mm snout-vent length) ..... *L. pratensis*
   b) A row of median scales present, either conspicuously enlarged or not; size variable 4

4. a) Preauricular scale small (= not enlarged in comparison with adjacent temporal scales) 5
   b) Preauricular scale much larger than adjacent temporal scales 7

5. a) Dorsal crest scales not attenuate or strongly overlapping; size moderate (♂♂ to 77 mm, ♀♀ to 73 mm snout-vent length); supraorbital semicircles usually complete; throat pattern very dark in both sexes to solid black in males, usually with remnants of longitudinal lines ..... *L. vinculum*
   b) Dorsal crest scales attenuate; size moderate 6

6. a) Male throat with heavy discrete dots on clear pale ground, female throat with faint gray dots; neck blotch present; face mask absent ..... *L. lunatus*
   b) Male throat solid black to patternless except for a few diffuse dots, female throat heavily patterned with dark gray spots; neck blotch absent; face mask present ..... *L. personatus*

7. a) Size larger (♂♂ to 80 mm, ♀♀ to 64 mm snout-vent length); dorsal crest scales enlarged but not attenuate or strongly overlapping; throat pattern present, consisting of a reticulum, black transverse bars, or dark smudges (somewhat variable between sexes); venter orange ..... *L. barahonensis*

   b) Size smaller (♂♂ to 53 mm, ♀♀ to 48 mm snout-vent length); dorsal crest scales only very slightly or not enlarged; throat white to pale purplish pink, immaculate or with some faint gray spots (females) or oblique lines (males); venter white to pale yellow ..... *L. semilineatus*

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