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THE *AMEIVA* (LACERTILIA, TEIIDAE) OF
HISPANIOLA.

II. GEOGRAPHIC VARIATION IN *AMEIVA*
CHRYSOLAEMA COPE

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No. 10 — *The AMEIVA (Lacertilia, Teiidae) of Hispaniola*
II. Geographic Variation in *Ameiva Chrysolaema* Cope

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INTRODUCTION

The largest of the three species of Hispaniolan ground lizards, *Ameiva chrysolaema* Cope, was described in 1868 with the type locality "Gonave Island." Three other names were then applied to this species in rapid succession: *vittipunctata* Cope 1871, *affinis* Fischer 1883, and *regularis* Fischer 1888. Of these, *vittipunctata*, as Cochran (1941: 275-276) has made clear, was apparently described by Cope from a young specimen (snout-vent length 88 mm) which was part of the same series from which he himself had taken the type of *chrysolaema*. Cope, however, gave a different type locality — "city of Santo Domingo" — for *vittipunctata*.¹

In her revision of the species in "Herpetology of Hispaniola," Cochran (1941: 275-292) considered *vittipunctata* Cope a strict synonym of *A. chrysolaema* Cope. *A. regularis* Fischer was regarded as a strict synonym of *affinis* Fischer, which was accepted as a valid mainland subspecies (a new status since *affinis* had previously been regarded either as a full species or a synonym).

Prior to 1941 two subspecies of *A. chrysolaema* had been described from satellite islands of Hispaniola: *A. c. woodi* Cochran from Ile de la Tortue and *A. c. abbotti* Noble from Isla Beata. These Cochran considered recognizable. A third subspecies, *A. c. boekeri* Mertens (1938: 338), however, from the mainland at Fondo Negro, República Dominicana, was rejected as a synonym of *A. taeniura*.

¹ Cochran (1941: 245) noted that the type locality of *Celestus* (= *Diploglossus*) *weinlandi*, also described by Cope and said by him to have been collected on Ile de la Gonâve, was incorrect and the specimen actually came from the mainland within 25 miles of Port-au-Prince, Haiti. Since A. C. Younglove who collected the type of *C. weinlandi* in 1868 also collected the type of *A. chrysolaema*, it is appropriate, as Dr. Cochran has done, to restrict the type locality of *A. chrysolaema* to "within 25 miles of Port-au-Prince." If the type of *A. vittipunctata* is actually part of the same series as the type of *A. chrysolaema*, the type locality of the former should likewise be considered the same as that of the latter, despite Cope's statement that it came from the city of Santo Domingo.

The discussion below departs radically from Cochran's revision in rejecting *affinis* while recognizing many other mainland subspecies. In large part this has been due to the much greater amount of material available to us.

Six hundred and fifty-five carefully documented and noted specimens of *A. chrysolaema* have been collected by ourselves and associates between June 1962 and September 1964. Large fresh series of this lizard are now available to us from southern and central Haiti, from Ile de la Tortue and Gonâve, and from the whole of its range in the República Dominicana. These specimens are in the Albert Schwartz Field Series (ASFS) and the collection of Richard Thomas (RT). They have been amassed through the efforts of Miss Patricia A. Heinlein, and Messrs. David C. Leber and Richard Thomas. All deserve our commendations and thanks, most especially Messrs. Leber and Thomas who made special efforts on our behalf to secure topotypes of *A. c. abbotti* on Isla Beata. In addition, we have examined 417 specimens in the following collections: American Museum of Natural History (AMNH), Carnegie Museum (CM), Museum of Comparative Zoology (MCZ), Museum of Zoology, University of Michigan (UMMZ), and United States National Museum (USNM). To the curators and their assistants — Charles M. Bogert and Miss Grace M. Tilger, Neil D. Richmond, Ernest E. Williams, Charles F. Walker and George R. Zug, Doris M. Cochran and James A. Peters — we wish to express our appreciation for allowing us to examine pertinent specimens under their care. Paratypes of new forms have been deposited in the Museum of Natural History, University of Kansas (KU), and the University of Illinois Museum of Natural History (UIMNH), as well as in the above collections. The Harvard collections once again have been indispensable; through the efforts of Dr. Williams, large and well preserved series from northern Haiti have been made available to us; without these our interpretation of the northwestern Haitian situation would have been not merely difficult, but rather impossible. In the matter of literature, Edmond V. Malnate has been most helpful and we are grateful for his co-operation. The illustrations are the work of the junior author.

SYSTEMATIC ACCOUNT

THE SPECIES AS A WHOLE

Ameiva chrysolaema may be defined as follows: 1) a large species of the genus *Ameiva* with snout-vent length to 160 mm in males and 134 in females; 2) dorsal caudal scales keeled and

straight; 3) ventrals in 10, 11, or 12 transverse rows and in 33 to 41 longitudinal rows; 4) fourth toe subdigital scales from 66 to 101; 5) femoral pores 24 to 52; 6) fifteenth caudal verticil with 30 to 52 scales; 7) dorsal pattern consisting of one of the following: a) a series of dorsal yellow to buffy longitudinal lines on a brown, tan, grayish tan, greenish, or blackish ground color, the lines (straight or wavy) at times modified into dashes, dots, or fused with one another to give ultimately a median dorsal longitudinal band, b) a rather uniform covering of brightly colored (blue, orange, yellow) spots on a dark background, c) a pale ground with dark vermiculations and tigroid vertical lateral bars, or d) completely or almost unicolor dorsally without any striking pattern elements; and 8) hemipenis extending to about the seventh to ninth caudal verticil, sulcate surface naked, sulcus bifurcating apically, the branches ending in two poorly defined scalloped apical discs, non-sulcate surface entirely flounced, the flounces extending to the margins of the sulcate surface, a small smooth triangular area on the non-sulcate side which divides the flounces for about one-third the length of the organ into two fields of flounces which correspond to the apical discs.

The center of the distribution of *A. chrysolaema* is in the Cul de Sac-Valle de Neiba region of Hispaniola; the species is represented by large series and from numerous localities in this general region. From here, *A. chrysolaema* extends westward to the vicinity of Léogâne on the Tiburon Peninsula, and eastward as far as San Pedro de Macorís in the República Dominicana. From Léogâne to San Pedro de Macorís, there is a set of localities which implies a more or less continuous distribution. From this basic center, populations extend northwestward along the shore of the Golfe de la Gonâve into the valley of the Rivière de l'Artibonite, and in the central portion of Haiti at least as far north as the vicinity of Mirebalais. In the República Dominicana, there is practical continuity of the main southern mass of the species north of the Sierra de Neiba in the Valle de San Juan and thence to the Dominico-Haitian border near Pedro Santana and immediately across the border at Cerca-la-Source in Haiti. A second major center lies in the northwestern portion of Haiti and extends thence eastward into the Valle de Cibao in the República Dominicana. Whether these two major populations are completely isolated from one another is unknown; there is at least no contact in the República Dominicana, since the Cordillera Central stands between the two main regions, and the central valley along the eastern slopes of this range is unoccupied by *chrysolaema*.

There are several apparently disjunct populations in southern Haiti and the República Dominicana; in the former country there is a single specimen from Aquin to the west along the Tiburon Peninsula, far removed from the nearest records from Léogâne. In the República Dominicana there are specimens from Juanillo near the eastern extremity of the island. Although there are no records from between San Pedro de Macorís and Juanillo, the species has presumably occurred in that region fairly recently (and may still occur as isolated populations), since it occurs on Isla Catalina and Isla Saona. It is at present unknown from the adjacent mainland in each case. There were two specimens reported (Cochran, 1941:282) from Ile-à-Vache but these cannot now be located; although in two extended visits to this island we secured only the very abundant *A. taeniura* Cope, it is not altogether impossible that *A. chrysolaema* occurs there as well. Finally, there are populations south of the Sierra de Baruco-Massif de la Selle which are completely cut off by these ranges from their more northern relatives; this same phenomenon has now been noted in several other species of reptiles from this area. These mountains, as well as the virtually non-existent coastal plain along the eastern shore of the Península de Barahona, form an inescapable trap for several reptiles in the southern portion of the Península.

For the remaining satellite islands, *A. chrysolaema* is represented by abundant material from Ile de la Gonâve and occurs also on Ile de la Tortue, Isla Beata, and the Siete Hermanos islands off the northwestern portion of the República Dominicana. Of the three species of Hispaniolan *Ameiva*, none has so broad a range as does *A. chrysolaema*. Nonetheless, there is geographic evidence that even this species is retracting its range; the apparent absence of *chrysolaema* from much of the southeastern portion of the República Dominicana, but its occurrence on off-shore islands in this region, suggests a formerly more widespread distribution in this area.

A. chrysolaema is absent from the distal third of the Tiburon Peninsula in Haiti, and apparently from much of the central portion of that country as well. In the República Dominicana it does not occur in the Cordillera Central nor the Sierra de Neiba, and is absent from the central and eastern portions of the country except along the southeastern coast. Interestingly, despite its occurrence in the Valle de Cibao, it does not occur along the northcentral coast of the República Dominicana. The Cordillera

Septentrional acts as an effective barrier in this region. Much of the eastern República Dominicana is mesic (in fact, the area of highest rainfall in the country occurs in this region), and since *A. chrysolaema* is distinctly a lizard of xeric habitats, this one factor may well have prevented its expansion into this region and onto the Península de Samaná. However, its absence along the coast from Cabo Engaño westward is strange, since this coast is arid and appears suitable for these lizards. Considering the disjunct nature of the populations of the species in extreme eastern Hispaniola, it is possible that it never occurred in this region or that it has already retreated from this suitable coastal area.

A. chrysolaema lives in xeric regions. It is abundant in the Cul-de-Sac plain below sea level and on the Península de Barahona. It occurs also in the dry Valle de San Juan, at elevations of about 1000 feet. Although more tolerant of less xeric situations than *A. lineolata*, the two often occur together, with *A. lineolata* inhabiting more open, cactus-studded, sandy regions, and *A. chrysolaema* preferring slightly more shady areas, such as adjacent copses or thickets of *Acacia*. If lowland woods are present, *A. chrysolaema* may invade them; the woods may not be dense nor with abundant ground cover. Maritime deciduous forests along the mangrove border (but usually not the mangroves themselves) offer a suitable habitat. Scrub-lands and open beaches with some cover are often adequate. In its relationships with the other two species, *A. chrysolaema* most often occurs with *A. lineolata* as noted above. On occasion, however, *A. chrysolaema* occurs with the shade-loving *A. taeniura*. In such instances, *chrysolaema* appears to be the secondary invader of a habitat which is the preferred habitat of *taeniura*; in one such case near Oviedo on the Península de Barahona, *taeniura* kept strictly to the open dry forest, whereas *chrysolaema* occurred almost exclusively along the edges of the woods where they abutted on a dry mangrove flat. The latter is likely the more preferred habitat of *chrysolaema*, but during the heat of the day this species was not averse to foraging in marginal forested situations.

CHARACTERS STUDIED

We have examined a total of 1072 specimens of *A. chrysolaema* (in contrast to 42 examined by Barbour and Noble, 1915, and 198 by Cochran, 1941); of these, 655 are specimens collected by ourselves and parties at various times, and upon which we have extensive data on coloration and pattern. Of the races

recognized and described in the present paper, we have seen living or freshly killed specimens of all but two (the race from northwestern Haiti, and the race from extreme eastern República Dominicana). We feel that data on coloration and pattern are absolutely indispensable for any modern worker on the genus *Ameiva*. Old, faded, or (even worse) badly discolored specimens are completely useless except for scale counts and measurements, and analyses of populations must rest heavily and securely upon data from living or freshly killed animals.

We have taken counts of rows of longitudinal and transverse ventrals, fourth toe subdigital scales, femoral pores, and scales in the fifteenth tail verticil (see Tables 1-4). Of these, only the number of transverse rows of ventrals can be used (partially) to characterize subspecies — i.e., having either 10 or 12 transverse rows of ventrals. No population has all specimens with 10 or all with 12 rows. However, there is most often a preponderance of one or the other in any particular sample, and we have used this modal number as typical of the race in question (Table 2), unless the sample is rather small or the two categories differ by only a very few individuals.

Of least value systematically is the number of longitudinal rows of ventrals. In the entire lot of *A. chrysolaema* examined, this figure varies from 33 to 41. The means for the 15 populations described herein vary from 38.3 to 36.5. Data for longitudinal rows are presented in each case, but these data are not emphasized.

The counts of fourth toe scales, femoral pores, and fifteenth verticil scales show some trends, although in almost all cases the amount of overlap is rather large between most populations. Differences of means, however, between those races which rank first and last in each category may be rather striking (see Tables 2, 3 and 4). The largest difference between the highest and lowest populations is in fourth toe scales, where the high population has a mean of 91.0, and the low 77.8 — a difference of 13.2 scales. For facility we have combined in all cases the fourth toe scales from both feet and the femoral pore counts for both legs into one figure for each specimen; we do not feel that this weakens the use of the data and it may well intensify slight differences, which would otherwise be almost unnoticeable. We have given the means and extremes for these three scale counts for each subspecies; the differences, if any, obviously are mean differences, since overlap of ranges is great in most cases.

THE RECOGNIZABLE SUBSPECIES

AMEIVA CHRYSOLAEMA CHRYSOLAEMA Cope, 1868

Ameiva chrysolema Cope, 1868, Proc. Acad. Nat. Sci. Philadelphia, 20:127 (type locality — “Ile de la Gonâve” = within 25 miles of Port-au-Prince, *vide* Cochran, 1941:275).

Ameiva vittipunctata Cope, 1871, Proc. Acad. Nat. Sci. Philadelphia, 22:220 (type locality — “city of Santo Domingo” = within 25 miles of Port-au-Prince; see Cochran, 1941:275-76 for discussion of rationale for this restriction).

Ameiva affinis Fischer, 1883, Beschreibungen neuer Reptilien, [Separat-Abdruck aus dem] Osterprogramm des akademischen Gymnasiums, Hamburg, p. 1 (type locality — “Haiti”).

Diagnosis: A subspecies of *A. chrysolema* characterized by a combination of very large size (males to 160 mm, females to 130 mm snout-vent length), usually 12 transverse rows of ventrals, moderate number of fourth toe subdigital scales, high number of femoral pores and of scales in the fifteenth tail verticil; dorsal pattern consisting of about six longitudinal yellow lines and/or yellow dots arranged in series (Fig. 1, *left*), and a black gular band which may involve the chest and undersides of the arms.

Distribution: From St. Marc (and including the “Artibonite Valley”) on the north, southeast along the shore of the Golfe de la Gonâve, east throughout the Cul-de-Sac plain to the environs of Etang Saumâtre (Manneville, Ganthier, Fond Parisien), and west on the Tiburon Peninsula as far as the vicinity of Léogâne (Père); an isolated specimen from Aquin, Dépt. du Sud, Haiti (Fig. 11).

Discussion: *A. c. chrysolema* is distinctly the largest and most bulky of the races of the species. Males reach a snout-vent length of 160 mm and females 130 mm. Color notes on a series from Eaux Gaillées in the Haitian Cul de Sac show the situation as far as coloration and pattern are concerned. Males from Eaux Gaillées were noted as dark brown to reddish brown dorsally, especially reddish on the shoulders and head (which may also be grayish). Lores and cheeks with gray blotches. The back has either a series of six yellow lines and yellow dots in the interspaces between the lines, or has six rows of lemon yellow spots. The lateral fields are black with or without a longitudinal series of yellow spots. The lower sides have large yellow spots as well, and the lateralmost belly plates are blue-spotted. The ventral ground color is dull blue-gray, the throat pale orange (Maerz and Paul, 1950, Pl. 9D7). There is a black gular band,

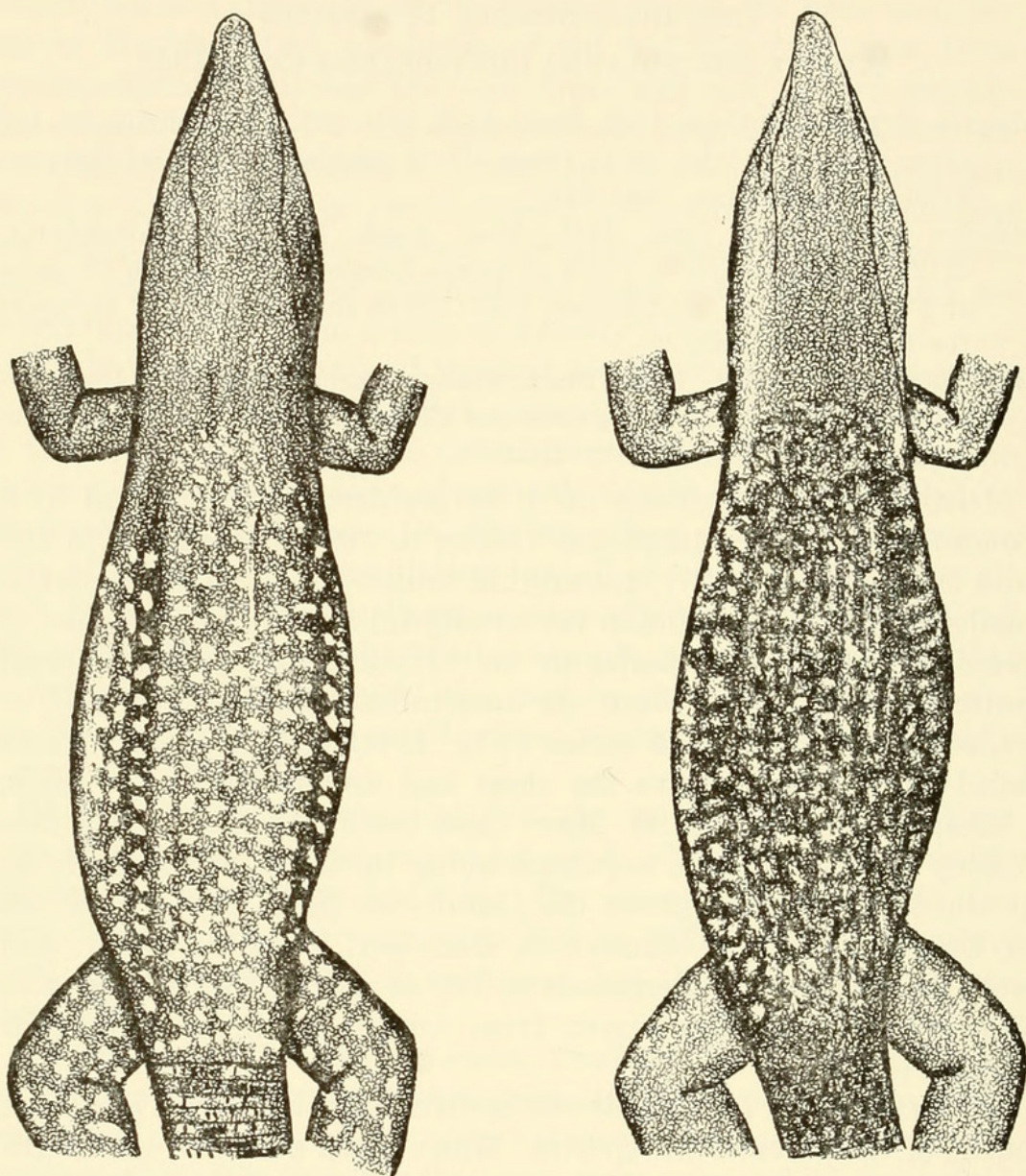


Fig. 1. *Left*, *Ameiva chrysolaema chrysolaema*, ASFS X2162, 3.9 mi. NW Ganthier, Dépt. de l'Ouest, Haiti. *Right*, *Ameiva c. umbratilis*, holotype, MCZ 77231, Barahona, Barahona Prov., República Dominicana.

which may expand posteriorly to cover the chest and undersides of the arms. Some adult males have the shoulders and neck blackened, so that in these regions the yellow lines are much dulled and obscured. The females are like the males except that the lines are yellow and prominent anteriorly. The venter is dull blue-gray. The black gular collar is present but less pronounced than that of the males, and the throat is orange but paler than that of males.

A series from Diquini to the west of Port-au-Prince was colored much as the Eaux Gaillées material. The dorsal ground color in males was brown with yellow dots arranged in lines or with yellow lines additionally present. There is a black lateral field with yellow spots. The sides of the head and axillae had vivid and prominent blue to blue-green blotches. The heads were dull reddish brown to dull orange, with orange-pink throats. The ventral ground color was grayish to orange with blue spots on the sides of the abdomen. The hindlimbs were dotted with yellow, the forelimbs with blue-green. Females resemble the males, but the dorsal lines or dots are less bright and prominent.

From the above descriptions it is obvious that, despite some differences in details, these two populations (as well as many others throughout the range of *chrysolaema*) share a community of dorsal markings—the longitudinal series of yellow lines and/or dots. Cochran (1941: pl. 8E) showed a dorsal view of the type of *A. chrysolaema*. The six dorsal lines, in this case partially fragmented into series of longitudinal dashes, are quite distinct. There is no doubt that the type of *A. chrysolaema* did indeed originate in the vicinity of Port-au-Prince, since only this subspecies occurs anywhere near that city. Specimens from Ile de la Gonâve are much duller, less prominently marked, lack fragmentation of the dorsal lines, and are not referable to the nominate form.

The longitudinal ventrals vary between 35 and 40 (mean 37.7) and these scales are most often arranged in 12 transverse rows (67.9 per cent), with 29.2 per cent having 10 transverse rows and 2.9 per cent having 11 rows. The variation in number of transverse rows depends primarily on whether the lateralmost of the enlarged ventral scales is sufficiently large to be considered a ventral; we have so considered it if its length (longitudinally) is equal to that of the next inner adjacent row, and if its width (transversely) is equal to at least half that of the next inner adjacent row. Occasional specimens may also have one or two rows of the belly plates divided, thus attaining counts of 11 or 12 in another fashion.

The fourth toe subdigital scales range from 76 to 101 (mean 86.7) and the femoral pores range from 33 to 50 (mean 43.7). The scales in the fifteenth caudal verticil vary between 37 and 51 (mean 44.4).

Within the range ascribed to *A. c. chrysolaema*, there are various relatively minor pattern variants which we consider as

part of the normal variation of the subspecies. Specimens from St. Marc at the northwesternmost extreme of the range are very boldly lined longitudinally; the same is true of two individuals from Manneville. In both cases there are specimens from adjacent localities or from the same locality which have more typical *chrysolaema* markings.

The single individual from Aquin (USNM 72614) is unique in several (possibly significant) features. The longitudinal lines are composed of dots which also have a more or less transverse arrangement, so that the back has a rather conspicuous transversely banded appearance, a condition seen in no other *A. c. chrysolaema*. The black lateral field is obscured, and there is no black gular band, the entire throat, chest and undersides of the arms being unmarked. The specimen is an adult male with a snout-vent length of 146 mm, ventrals in 38 longitudinal and 12 transverse rows, 95 subdigital fourth toe scales, 41 femoral pores, and 43 scales in the fifteenth caudal verticil. None of these counts will distinguish the specimen from *A. c. chrysolaema*, although we attach no particular significance to this fact. Considering the wide gap between the known localities of *A. chrysolaema* between Père near Léogane and Aquin (a distance of some 90 kilometers) and the fact that the Aquin specimen comes from the southern, in contrast to the northern, side of the Tiburon Peninsula, it is likely that this single individual comes from a population which is distinct from *A. c. chrysolaema*. Without additional material, and especially lacking careful data on coloration and pattern in life, we are unwilling to name this single Aquin specimen as distinct from *A. c. chrysolaema*.

The character ascribed by Cochran (1941:277) to differentiate *A. c. affinis* — i.e., the interparietal being larger than the adjacent scales — we find to be completely untenable. Dr. Cochran has also shown (1941:291) that the scale counts of *affinis* fall within the known range of *A. c. chrysolaema*. Specimens which she assigned to *affinis* were reported (1941:292) from Momance, Manneville, and Père in Haiti. Other specimens (p. 282) from Manneville were assigned to *c. chrysolaema*. In a series of twenty-seven specimens from Fond Parisien and the eastern Cul de Sac, for example, six have the interparietal larger than adjacent scales and the balance have the interparietal smaller. The same situation applies to series from other localities within the range of *A. c. chrysolaema*, and if we accept *affinis* as differentiated by this character alone, then the races

chrysolaema and *affinis* are broadly and randomly sympatric. No features of pattern or coloration will distinguish specimens with smaller interparietals from those with larger interparietals, and we cannot detect any other constant scale feature which will distinguish two forms in this region. For this reason we consider *affinis* Fischer as a synonym of *chrysolaema* Cope. The reasons for considering *vittipunctata* Cope as a synonym of *chrysolaema* have been outlined in the introduction.

Specimens examined: Haiti, *Dépt. de l'Artibonite*, "Artibonite Valley" (not mapped), 1 (USNM 75921); St. Marc, 5 (USNM 59079, MCZ 58012-13, 65351, AMNH 49766); *Dépt. de l'Ouest*, 2.2 mi. (3.5 km) SW Trou Forban, 1 (ASFS X1927); between Arcahaie and Trou Forban, 1 (MCZ 51433); 6.3 mi. (10.1 km) NE Arcahaie, 3 (ASFS X1928, X1930, X1946); 13 mi. (20.8 km) SW Arcahaie, 1 (ASFS X1938); Port-au-Prince, 12 (AMNH 49637-38, MCZ 13839, 59495-502, 69420); Carrefour Feuille, Port-au-Prince (not mapped), 1 (MCZ 65810); Delmas, 2 (MCZ 65808-09); Pétionville, 1 (USNM 59078); 10 mi. (16 km) SW Port-au-Prince, 1 (UMMZ 92197); 3.5 mi. (5.6 km) E Croix des Bouquets, 15 (ASFS X2197-211); Eaux Gaillées, 33 (ASFS X1651-83); Manneville, 11 (MCZ 8621-23, 8625, 8629-33, 8614, 8618); 3.9 mi. NW Ganthier, 18 (ASFS X2153-70); 1.3 mi. (2.1 km) NW Fond Parisien, 3 (ASFS X2174-76); 0.4 mi. (0.6 km) SE Fond Parisien, 7 (ASFS X2189-95); Hatte Latham (not mapped), 1 (MCZ 51424); Diquini, 36 (ASFS X2381-407, MCZ 6292, 8706, 8649-51, 8653-54, 8658-59); Momance, 8 (MCZ 8634-35, 8638-41, 8649, 20875); Ça Ira, 2 (MCZ 64919-20); Père, 3 (MCZ 13271-73); *Dépt. du Sud*, Aquin, 1 (USNM 72614).

AMEIVA CHRYSOLAEMA UMBRATILIS,¹ new subspecies

Holotype: MCZ 77231, a subadult female, from Barahona, Barahona Province, República Dominicana, taken 25 July 1963, one of a series taken by native collectors. Original number X9721.

Paratypes: All from the República Dominicana, as follows: MCZ 81000-04, USNM 152558-60, KU 79861-64, UIMNH 56886-89, RT 738-39, same data as holotype; ASFS X9568-69, Barahona, Barahona Prov., 24 July 1963, native collector; AMNH 37943-49, 38133-39, Barahona, Barahona Prov., 12 October 1922,

¹ From the Latin for "remaining in the shade."

G. K. Noble; AMNH 63191, 63193, Barahona, Barahona Province, 10-19 July 1932, W. G. Hassler; MCZ 58019, Barahona, Barahona Prov., 13 July 1932, W. G. Hassler; MCZ 43813-14, Barahona, Barahona Prov., 18 July 1932, W. G. Hassler; ASFS V199-200, 4 km NW, 1 km SW Barahona, Barahona Prov., 5 August 1963, A. Schwartz, R. Thomas; AMNH 49837-38, "Palomino Springs, nr. Barahona" (not mapped), Barahona Prov., 15 August 1935, W. G. Hassler.

Associated specimens: República Dominicana: Independencia Prov., 6.5 mi. (10.5 km) NE Jimaní, 1 (ASFS X9507); 4.4 mi. (7.0 km) SE Jimaní, 3 (ASFS X9515-17); 13 km SW La Descubierta, 3 (ASFS X9364-66); 5 km E La Descubierta, 5 (ASFS X9354-58); Las Baitoas, 1 (MCZ 58776); 22 km SE Duvergé, 7 (ASFS X9928-34); 1 km W El Naranjo, 1000 feet, 2 (ASFS X9943-44); northwest side, Laguna del Rincón, 1 (MCZ 58779); Guayabal, 9 km N Postrer Río, 2 (MCZ 57732-33); *Baoruco Prov.*, Jaragua, 5 (ASFS X9469-72, RT 713); 0.7 mi. (1.2 km) E El Estero, 2 (ASFS X9467-68); 0.8 mi. (1.3 km) SW Neiba, 15 (ASFS V252-64, RT 775-76).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of moderate size (males to 130 mm, females to 112 mm snout-vent length), usually 10 (but often 12) transverse rows of ventrals, moderate number of fourth toe subdigital scales, low number of femoral pores, and high number of scales in the fifteenth caudal verticil; dorsal pattern consisting of dull grayish brown to greenish black dorsal ground color with a series of eight to ten dorsal longitudinal lines composed of small and numerous dull yellowish to tan dots (Fig. 1, *right*), and a black gular band which in adult males may involve the chest and undersides of the arms.

Distribution: The Valle de Neiba from just east of Jimaní to the vicinity of the city of Barahona, República Dominicana (Fig. 11).

Description of type: A subadult female with the following measurements and counts: snout-vent length 93 mm, tail 184 mm; ventrals in 37 longitudinal and 10 transverse rows; fourth toe subdigital scales 39 and 41 (total 80); femoral pores 18 and 17 (total 35); 43 scales in the fifteenth caudal verticil. Dorsal ground color grayish brown in life, head gray, shoulders greenish; ten rows of dull yellowish dorsal dots, the dots in each series virtually confluent with one another, giving a vague wavy line; lateral fields obscure darker gray with scattered buffy dots.

Throat pale purplish orange, followed by a black gular band which extends slightly onto the chest and onto the underside of the forelimbs; ventral ground color grayish blue; tail dull grayish brown above and grayish blue below, with some scattered darker scales dorsally.

Variation: See tables. The characters of *umbratilis* are best expressed in populations from the eastern section of the Valle de Neiba; however, even the most western specimens from the vicinity of Jimaní are in no way comparable to Haitian *A. c. chrysolaema*. The dorsal ground color was noted in life as being greenish black (Jimaní, La Descubierta, Jaragua), greenish brown (Duvergé, El Naranjo), brown (El Estero), and grayish brown (Barahona). The dots in the dorsal longitudinal lines are tiny and very often confluent, giving almost a vermiculate appearance to the dorsal band; the dots vary in color from greenish (Jimaní), creamy (La Descubierta), pale yellow to pale green (Duvergé), yellow (El Estero), grayish yellow (Jaragua), or dull yellowish to tan (Barahona).

The lateral fields are usually dull and inconspicuous, hardly darker than the lateral coloration; they often include a row of yellow to creamy spots and are not outlined either above or below by pale and prominent longitudinal lines. The ventral coloration varies from pinkish gray and grayish orange to grayish blue, with specimens having the brighter colors known from the western extremity of the range. The throats are dull pinkish gray and grayish orange to dull purplish or dull orange. The black gular band is invariably present and may, in adult males, expand to cover much of the chest and anterior abdomen and underside of the forelimbs. The upper surfaces of the limbs are usually unspotted, but if there are a few scattered dots these are blue on the forelimbs and yellow on the hindlimbs.

Comparisons: The coloration and pattern of *chrysolaema* and *umbratilis* are strikingly different; even in the western portion of the range of *umbratilis*, no specimen approaches closely the vivid dorsal coloration and pattern of the nominate race. The extreme condition in the eastern Valle de Neiba contrasts strongly with the condition at Fond Parisien, for instance, and specimens from Jimaní and La Descubierta are much more like individuals from Barahona in having fine dorsal dotting and generally more drab colors than they are to specimens from Fond Parisien. *Umbratilis* is a smaller lizard; no specimen of either sex of this race achieves the much bulkier and larger

size of *chrysolaema*. This is certainly not a sample artifact since large series of both forms are at hand. The tendency for *umbratilis* to have 10 versus 12 transverse rows of ventrals, as in *chrysolaema*, is of interest, although in *umbratilis* the specimens are almost equally divided between the 10- and 12-row conditions. In number of longitudinal ventral rows, the two races are comparable (*chrysolaema* 37.7, *umbratilis* 37.1). In number of femoral pores these two races differ strongly, with a mean of 43.7 in *chrysolaema* and 35.6 in *umbratilis*. *Chrysolaema* averages slightly higher in counts of femoral pores and fifteenth verticil scales.

Remarks: The occurrence of two very distinct races of *A. chrysolaema* in the Cul de Sac-Valle de Neiba complex is surprising. Aside from the more mesic eastern and western ends of this long xeric valley, the conditions throughout are quite comparably severe. Interestingly, the Valle de Neiba is greatly constricted just to the east of Jimaní; it is possible that this narrow neck (7-10 km) has been effective in separating these two races. Specimens from the República Dominicana to the northwest of Jimaní may well be assignable to *A. c. chrysolaema*.

AMEIVA CHRYSOLAEMA BOEKERI Mertens, 1938

Ameiva chrysolaema boekeri Mertens, 1938, Senckenbergiana, 20:338 (type locality — south of Fondo Negro, lower Río Yaque del Sur, Barahona Province, República Dominicana).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of moderate size (males to 126 mm, females to 111 mm snout-vent length), usually 10 transverse rows of ventrals, moderate number of fourth toe subdigital scales, low number of femoral pores, and high number of scales in the fifteenth verticil; dorsal pattern of two phases: (1) back yellowish brown, grayish tan, to olive, and without pattern and often without any indication of lateral fields, or (2) dorsum colored as above but with faint paler marblings or longitudinal lines and a fairly prominent black to dark gray lateral field (Fig. 2), and a black gular band which may involve the chest and underside of the arms.

Distribution: North of the Río Yaque del Sur in extreme eastern Valle de Neiba, north and east to north of Azua and east to the vicinity of Baní, in the Llanos de Azua, República Dominicana; intergrades with the next subspecies to the northwest in the vicinity of Hato Nuevo, Azua Province (Fig. 11).

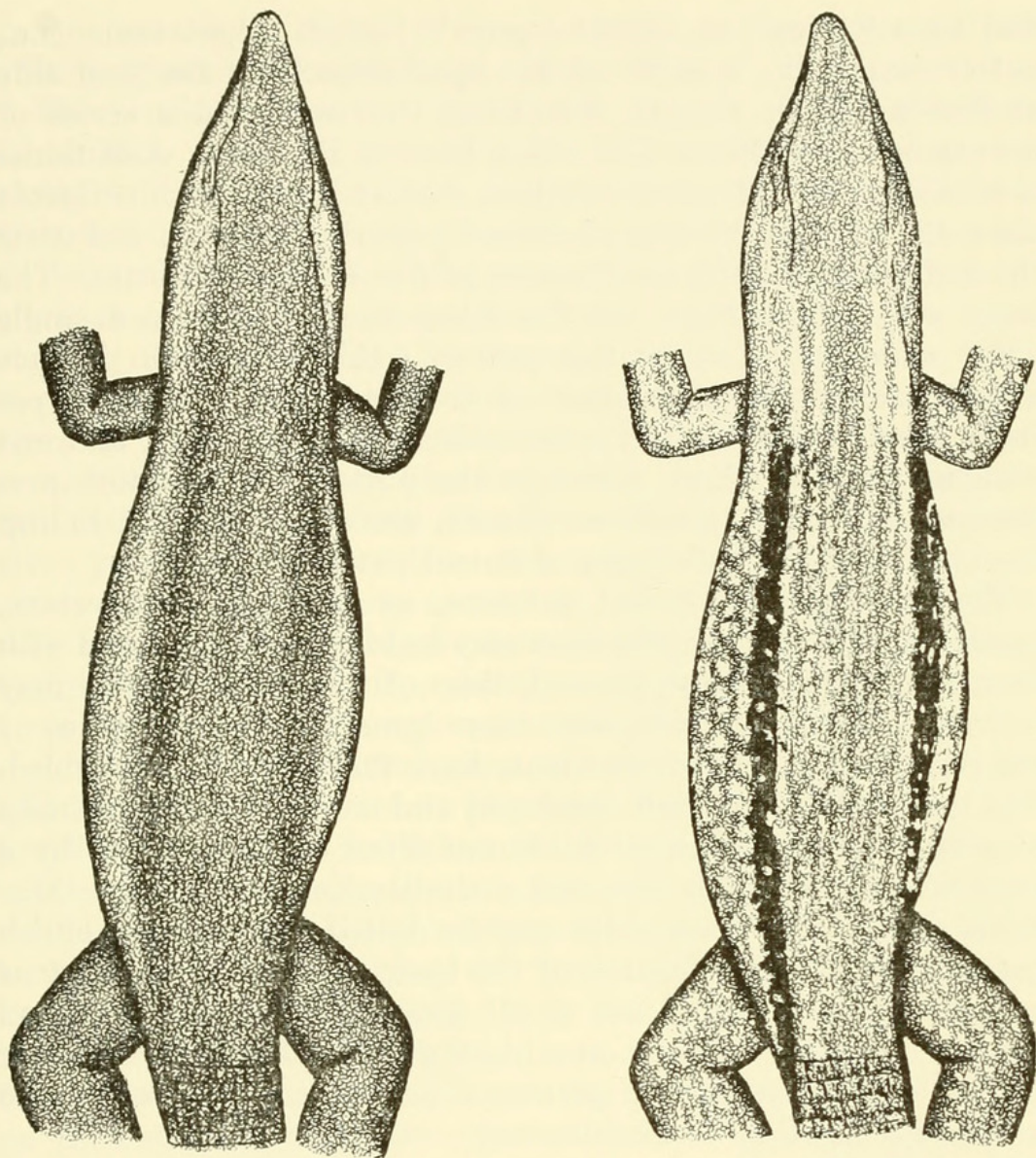


Fig. 2. *Left*, *Ameiva c. boekeri*, ASFS X7811, 10 mi. NW Baní, Peravia Prov., República Dominicana. *Right*, *Ameiva c. boekeri*, ASFS V689, 15.2 mi. S San José de Ocoa, Peravia Prov., República Dominicana.

Discussion: *A. c. boekeri* was described on the basis of fourteen lizards from Fondo Negro. Of these, seven males were dorsally patternless (including the type), four males showed a “*chrysolema*”-like pattern, and the final male was considered by Mertens (1939:72) to resemble the Beata race *abbotti*—i.e., it was dorsally dotted. The two paratype females were “*chrysolema*”-like as well. We have examined a single paratype of *boekeri* (MCZ 44757) and eighty-six other specimens from the range ascribed by us to *boekeri* above. Of ten localities, only

two have "pure" or almost "pure" *boekeri* populations (i.e., patternless), viz., a series of five specimens from the west side of Punta Martín García, Barahona Province, and a series of twenty-one from 10 mi. NW Baní, Peravia Province. Additional specimens (four) from the eastern side of Punta Martín García show the typical duality of dorsal pattern, however, and thus the uniformity of this small series of five is not significant. The large series from Baní, on the other hand, has only a single adult male which shows any pattern; this population is thus almost completely patternless. A fresh series of five topotypes from Fondo Negro has four individuals with patterns, and one without pattern. Thus, although the patternless condition predominates at some localities (Baní), elsewhere (and including the type locality) both types of dorsal pattern occur.

The two types of dorsal patterns, as delimited by Mertens, grade into one another. The back may be longitudinally lined with from six to ten tan to yellowish lines of fine dots, or these may be very obscure centrally and more prominent at the sides of the dorsal field. Some individuals have the back finely marbled. The lateral fields are well developed and enclose a series of buffy to cream dots; the lateral fields are often outlined below by a longitudinal yellowish line, and a similar line may border these fields above. The lower sides may be dotted with blue or bluish green. The dotted condition of the back, considered by Mertens as being *abbotti*-like, is not at all comparable to the large and brilliant sky-blue spotting on a black ground of that race. There is some similarity between patterned *boekeri* and *umbratilis*. No *umbratilis* however is unpatterned.

In patternless lizards, the dorsal ground color was recorded as yellowish brown (Fondo Negro), brown (San José de Ocoa), grayish tan (Punta Martín García), black (Barreras), and reddish brown (Baní). The lateral fields may be completely absent or may be indicated by a somewhat grayer longitudinal lateral stripe, without any sort of included or adjacent pale dots. The ventral ground color is blue-gray, purplish blue, blue, light olive, gray, or orange-gray. The throat is likewise variable, but is some shade of dull orange; females have throats which are typically more grayish orange than males. The tails are brown to grayish tan above, and gray below.

Scale counts for the series (including intergrades from Hato Nuevo) are: longitudinal ventrals 34-40 (mean 37.2), transverse ventrals in 10 (82.4 per cent) or 12 (17.6 per cent) rows,

fourth toe scales 73 to 98 (mean 84.6), femoral pores 31-41 (36.5), fifteenth verticil 37-48 (mean 42.7).

The much smaller size and faded pattern of those *boekeri* which have patterns, as well as the patternless individuals, can easily be distinguished from *A. c. chrysolaema*. *Chrysolaema* is likewise characterized by 12 rather than 10 rows of ventrals. In counts of fourth toe scales, femoral pores, and fifteenth verticil scales, *boekeri* averages less than *chrysolaema*, the most striking difference being in femoral pores (*chrysolaema* 43.7, *boekeri* 36.5). Patternless *boekeri* can be easily differentiated from all *umbratilis*, since this race is never patternless. Patterned *boekeri* are much like *umbratilis*. In both, the dorsal pattern is faded and not well demonstrated. One feature is suggestive; patterned *boekeri* have the lateral fields prominent and often outlined both above and below, whereas the typical *umbratilis* condition is an obscure lateral field, not set off by longitudinal pale lines. Both *umbratilis* and *boekeri* usually have 10 rows of ventrals, although *umbratilis* has a much higher frequency of 12-row individuals. In counts of fourth toe scales and femoral pores, *boekeri* averages slightly higher than *umbratilis*; the means for fifteenth verticil scales are identical.

Because of the similarities of *umbratilis* and patterned *boekeri*, we have considered the possibility that the name *boekeri* should be applied to *Ameiva* from the Valle de Neiba. To be counted against this conception is the fact that of 61 *umbratilis*, none is unpatterned, whereas 56.3 per cent of the specimens (*boekeri*) from north of the Río Yaque del Sur are patternless. There is no indication of this patternless condition in specimens from Barahona, nor from elsewhere in the range of *umbratilis*. We prefer to regard *boekeri* as a separate entity, distinct from *umbratilis* to the south.

A. c. boekeri is approached geographically by three adjacent races; of these it is known to intergrade only with the race to the northwest in the Valle de San Juan (these intergrades will be discussed later). From *umbratilis* the range of *boekeri* is separated by the lower reaches of the Río Yaque del Sur and by the extremely mesic conditions of much of the eastern portion of the Valle de Neiba. Although *boekeri* is not presently known to intergrade with the race next to the east along the southern coast of the República Dominicana, it may well do so. It is certainly significant that *boekeri* occupies the western Llanos de

Azua in the vicinity of Baní; just to the east of that city, conditions become more mesic, and the region is occupied by another race. Intergradation likely takes place where these two regions come into contact.

Specimens examined: República Dominicana, Barahona Prov., Fondo Negro, 6 (ASFS X9703-07, MCZ 44757); west side, Punta Martín García, 5 (ASFS V84-88); Azua Prov., 3 km E Barreras, 2 (ASFS V3164-65); 2 km W Puerto Viejo, 2 (ASFS V3183-84); 22 km NW Azua, 3 (ASFS V465-67); 1.8 mi. (2.9 km) W, 1.1 mi. (1.8 km) N Azua, 18 (ASFS X8002-18, X8103); 1.8 mi. (2.9 km) W, 2.7 mi. (4.3 km) N Azua, 10 (ASFS X8019-28); Peravia Prov., 8.9 mi. (13.9 km) S San José de Ocoa, 1300 feet (430 m), 1 (ASFS V714); 15.2 mi. (24.3 km) S San José de Ocoa, 9 (ASFS V687-95); 10 mi. (16 km) NW Baní, 23 (ASFS X7801-21, RT 613-14). Intergrades between *A. c. boekeri* and the race to the northwest were examined from: República Dominicana, Azua Prov., Hato Nuevo, 10 (ASFS X437-46).

AMEIVA CHRYSOLAEMA ALACRIS,¹ new subspecies

Holotype: MCZ 77232, an adult male, from 10 km SE San Juan, San Juan Province, República Dominicana, one of a series taken 9 August 1963 by Albert Schwartz and Richard Thomas. Original number V283.

Paratypes: All from the República Dominicana, as follows: ASFS V284-97, same data as holotype; RT 778-79, 10 km S San Juan, San Juan Prov., 9 August 1963, R. Thomas; MCZ 81005-06, USNM 152561-64, AMNH 92842-43, KU 79865-66, UIMNH 56890-93, 2.5 km W, 4.4 km S San Juan, San Juan Prov., 9 August 1963, D. C. Leber, R. F. Klinikowski; KU 79867-68, AMNH 92844, 2.5 km W, 5.4 km S San Juan, 9 August 1963, D. C. Leber, R. F. Klinikowski; ASFS V389-90, 10 km E Vallejuelo, San Juan Prov., 12 August 1963, R. Thomas; USNM 152565, 3 km E Las Matas, San Juan Prov., 9 August 1963, R. Thomas.

Associated specimens: Haiti, Dépt. du Nord, Cerca-la-Source, 1 (USNM 76780); República Dominicana, San Rafael Prov., 3.8 mi. (6.1 km) SE Sabana Cruz, 1 (ASFS V329); Guayabal, 1 (MCZ 58672); Azua Prov., Túbano (= Padre las Casas), 3 (USNM 66729-31); 0.7 mi. (1.1 km) NW Villarpando, 9 (ASFS V419-27).

¹ From the Latin for "lively."

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of moderate size (males to 126 mm, females to 109 mm snout-vent length), usually 10 transverse rows of ventrals, moderate number of fourth toe subdigital scales, very low number of femoral pores, and high number of scales in fifteenth caudal verticil; dorsal pattern consisting of five to seven bold longitudinal dorsal lines (the lateralmost forming a strong upper border to the prominent black lateral fields with their enclosed bright yellow dots), the longitudinal lines never broken into dots and lines as in *c. chrysolaema* and always conspicuous and discrete (Fig. 3, *left*), and a black gular band which rarely involves also the chest and undersides of the arms.

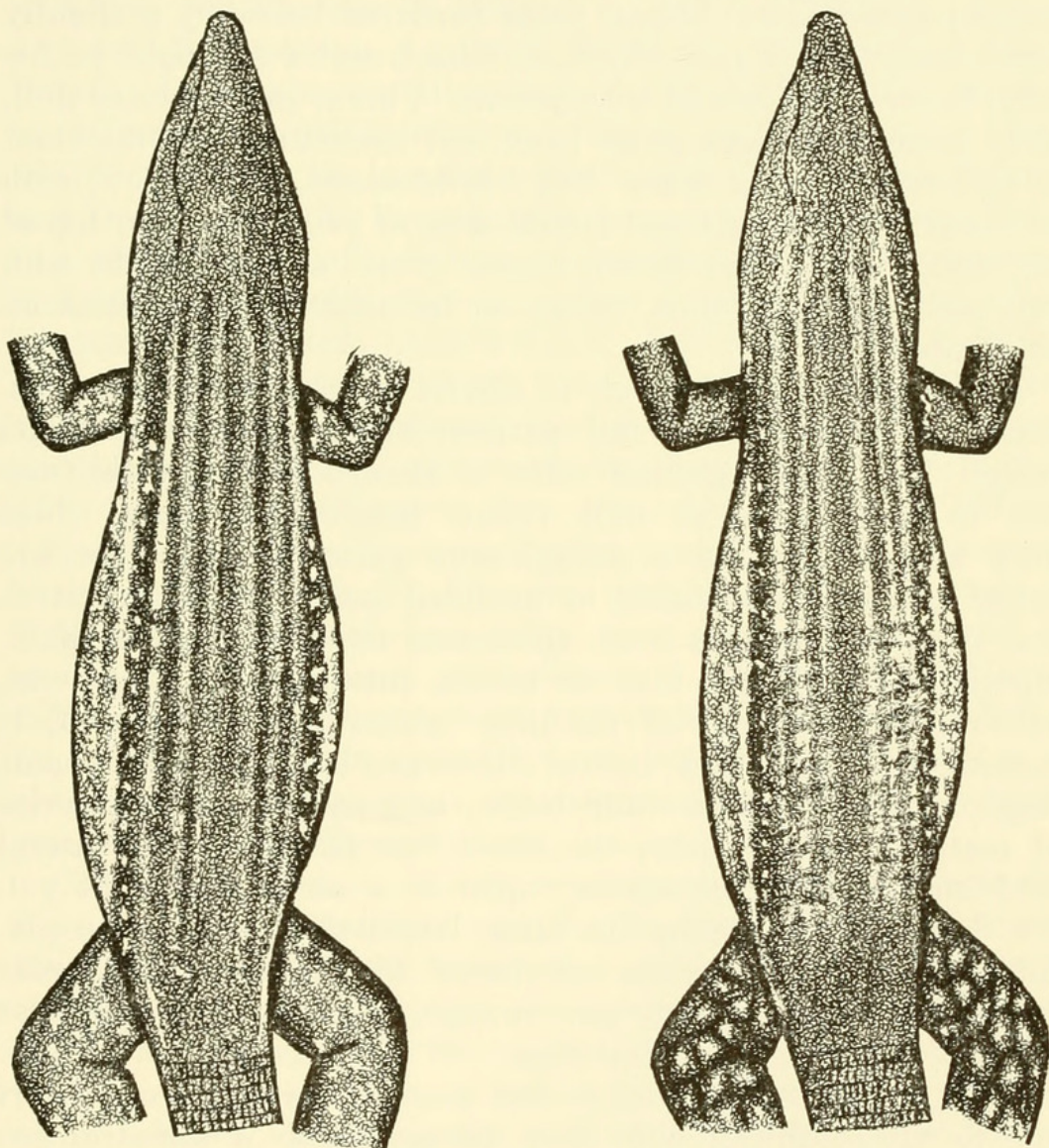


Fig. 3. *Left*, *Ameiva c. alacris*, holotype, MCZ 77232, 10 km SE San Juan, San Juan Prov., Republica Dominicana. *Right*, *Ameiva c. procax*, holotype, MCZ 77233, Santo Domingo, 2.2 km SW Río Ozama, Dist. Nac., República Dominicana.

Distribution: From east central Haiti (Cerca-la-Source) south-eastward through the Valle de San Juan (Fig. 11); intergrading with *A. c. boekeri* at Hato Nuevo, Azua Province, and with *A. c. chrysolaema* in the vicinity of Mirebalais, Dépt. de l'Ouest, Haiti (see discussion below).

Description of type: An adult male with the following measurements and counts: snout-vent length 116 mm, tail 200 mm; ventrals in 37 longitudinal and 12 transverse rows; fourth toe subdigital scales 42 and 44 (total 86); femoral pores 16 and 16 (total 32); 46 scales in the fifteenth caudal verticil. Dorsal ground color brown with seven longitudinal pale yellow lines, the lateralmost bordering above the black lateral fields with their isolated yellow dots; lateral fields bordered below by a slightly duller longitudinal line which contains a series of bright yellow dots; lower sides dotted with yellow. Throat gray, venter dull, dirty orange. A black gular band, not extending onto the chest or undersides of the arms. Tail brown above, gray below, with an indistinct proximal and lateral area of yellowish dots; top of tail with some darker brown scales. Fore- and hindlimbs with pale scattered small dots, bluish on forelimbs and yellowish on hindlimbs.

Variation: See tables. *A. c. alacris* presents a constant assemblage of coloration and pattern elements throughout its range. The dorsal ground color is always brown, with from five to seven pale or dull yellow longitudinal lines, these lines always forming a conspicuous pattern. The lines are entire and not fragmented or modified into series of longitudinal dots, although in some specimens the more central lines, especially posteriorly, may be broken into dashes. In general, however, the integrity of the lines (even when fragmented) is maintained. The black lateral fields are bold, set off by pale longitudinal lines above and below, and enclose a single series of scattered yellow dots; the lower line bordering the lateral field may have superimposed upon it a series of bright yellow dots, thus rendering the black lateral field even more conspicuous. The lower sides are dotted with yellow. The throat varies from gray to very pale orange, and the venter likewise varies between these two extremes.

A. c. alacris intergrades to the southeast with *A. c. boekeri* and to the southwest with *A. c. chrysolaema*. A series of ten specimens from Hato Nuevo, Azua Province (ASFS V437-46),

shows the intergradation with *boekeri*. Of this series, five are unpatterned *boekeri*, and five represent the patterned phase of that race. These five patterned lizards have the lateral fields darker than most patterned *boekeri*, and there is a distinct tendency to have the dorsal lines more boldly (brighter yellow) displayed anteriorly, although the posterior dorsal pattern is fainter and very like "typical" patterned *boekeri*. The distance from Hato Nuevo (*alacris* X *boekeri* intergrades) to Villarpando (*alacris*) is only ten kilometers, yet the series from the latter locality is typical of *alacris* in all ways and has no patternless individuals.

From the vicinity of Mirebalais, Dépt. de l'Ouest, Haiti, we have examined specimens from the following localities: 3.4 mi. (5.4 km) NE Barrage de Peligre, 2 (ASFS X2217-18); 1.1 mi. (1.8 km) S Mirebalais, 3 (ASFS X2237-39); Mirebalais, 1 (MCZ 68510); La Tombe, nr. Mirebalais, 8 (MCZ 68517-24); Boudou, nr. Mirebalais, 2 (MCZ 69387-88); Duvié, nr. Mirebalais, 1 (MCZ 68478). Of these, the last three places named, La Tombe, Boudou, and Duvié, cannot be located; they have not been mapped. Taken as a whole, this lot of lizards is intermediate between *chrysolaema* and *alacris*, although they are closer to *alacris* than to *chrysolaema*. Three lizards (ASFS X2237, ASFS X2217, MCZ 68510) show the disintegration of the dorsal lines into series of yellow spots, a typical *chrysolaema* feature. Several male specimens are larger than *alacris*, with snout-vent lengths of 133 to 145 mm (five lizards); two females have snout-vent lengths of 109 mm (the upper extreme of *alacris* females), and another has a snout-vent length of 110. In life, our specimens from Barrage de Peligre and Mirebalais had yellow lines and a greenish wash on the neck—the latter a *chrysolaema* character. Finally, some individuals have a discrete black gular band as in *alacris*, whereas others have the band expanded onto the chest and arms as in *chrysolaema*. We consider this entire lot of specimens intergradient between *alacris* and *chrysolaema*.

Comparisons: *A. c. alacris* is easily distinguished from the three previously described races on the basis of dorsal pattern; the discrete, bold, and undotted longitudinal lines of *alacris* contrast with the patternless or weakly patterned races *boekeri* and *umbratilis*, and with the larger and dorsally dotted and lined *chrysolaema*. *Alacris* is a race with ten transverse rows of ventrals as are *umbratilis* and *boekeri*, in contrast to the twelve-rowed *chrysolaema*. In fourth toe scales, *alacris* (84.8) averages close to *boekeri* (84.6), slightly higher than *umbratilis* (83.0)

and lower than *chrysolaema* (86.7). In femoral pores, *alacris* has the lowest average (33.8) of any race of *A. chrysolaema*; of the described forms, it is approached by *umbratilis* (35.6) and *boekeri* (36.5) and is far below *chrysolaema* (43.7). In scales in the fifteenth caudal verticil, on the other hand, both *alacris* and *chrysolaema* are high (44.0 and 44.4), with *boekeri* and *umbratilis* (both 42.7) lower.

Remarks: *A. c. alacris* occupies the high and xeric Valle de San Juan and associated upland foothills (i.e., Túbano). It is likely that it is more widespread in east-central Haiti than the present evidence of one specimen from Cerca-la-Source indicates. Presumably the race follows down the valley of the Rivière de l'Artibonite, and in the vicinity of Mirebalais has genetic contact with the more southern *chrysolaema*. Such genetic continuity may come across the Montagnes de Trou d'Eau from the Cul de Sac (although there is no obvious means of penetration of this mountain mass), or *chrysolaema* may reach Mirebalais via the valley of the Artibonite from the St. Marc area. The only evidence for the latter is the single specimen noted under *A. c. chrysolaema* from the "Artibonite Valley"; this individual may have come from some undetermined locality which is intermediate between St. Marc and Mirebalais. Further collecting in these areas should easily reveal the precise place of contact between these two races.

AMEIVA CHRYSOLAEMA PROCAX¹ new subspecies

Holotype: MCZ 77233, an adult male, from Santo Domingo, 2.2 km SW of the Río Ozama, Distrito Nacional, República Dominicana, one of a series taken 14 June 1963 by Ronald F. Klinikowski, David C. Leber, and Richard Thomas. Original number X7714.

Paratypes: All from the República Dominicana, as follows: ASFS X7711-13, X7724-26, MCZ 81007-10, USNM 152566-70, KU 79869-71, UIMNH 56894-97, RT 605-08, same data as holotype; ASFS X9254-56, Santo Domingo, old airport, Distrito Nacional, 17 July 1963, D. C. Leber, R. Thomas; AMNH 92845-49, 5.9 km W Santo Domingo, Distrito Nacional, 20 June 1964, D. C. Leber, R. Thomas.

Associated specimens: República Dominicana, San Cristóbal Prov., 8.4 mi. (13.6 km) NE Sabana Grande de Palenque, 2

¹ From the Latin for "bold."

(ASFS X8167-68); 4.2 mi. (6.7 km) NE Sabana Grande de Palenque, 22 (ASFS X8149-66, RT 643-46).

Diagnosis: A subspecies of *A. chrysolema* characterized by a combination of large size (males to 141 mm, females to 116 mm snout-vent length), usually 10 (but often 12) transverse rows of ventrals, moderate number of fourth toe subdigital scales, low number of femoral pores, and high number of scales in the fifteenth caudal verticil; dorsal pattern a series of six or seven longitudinal yellow lines in a reddish brown field, the lines usually wavy or broken into a series of longitudinal dashes (Fig. 3, right), and a black gular band which may be so expanded as to involve the entire ventral surface including the undersides of the arms.

Distribution: The coastal regions of San Cristóbal Province and the Distrito Nacional, from the Río Ozama on the east to the vicinity of Sabana Grande de Palenque on the west (Fig. 11); presumed to occur inland, since individuals were seen crossing the road near the city of San Cristóbal.

Description of type: An adult female with the following measurements and counts: snout-vent length 114 mm, tail 275 mm; ventrals in 38 longitudinal and 12 transverse rows; fourth toe subdigital scales 46 and 46 (total 92); femoral pores 18 and 20 (total 38); 44 scales in the fifteenth caudal verticil. Dorsal ground color rich reddish brown in life, with a series of seven dull longitudinal lines, the median line rather obscure, the lateral lines broken into a series of wavy dashes, the lateralmost lines bordering above the black lateral fields, which have a series of tiny yellow dots inclosed within them. Sides of head gray with a creamy subocular patch and some pale irregular blue blotches. Throat fleshy gray. Ventral color dark blue-gray. Hindlimbs heavily spotted with yellow, forelimbs faintly spotted with blue. A dark gray gular band not involving the chest and underside of the arms. Tail reddish brown above, dark gray below.

Variation: See tables. The series of *A. c. procax* is remarkably uniform in both coloration and pattern. The dorsal ground color is always some shade of reddish brown, and there may be a yellowish green wash over the shoulders. The longitudinal lines are conspicuous, although the median line may be reduced or faint. Only in young and subadult individuals are the lines entire, and even in these specimens there is a strong tendency toward wavy fragmentation. The lateral fields are black and the yellow dots included therein are regularly very tiny; in

females these included dots are less well differentiated than in the males. The gular band is present, and in large males may be very extensive, including most of the belly. The venter is blue in juveniles and females, and gray to solid black in males.

Comparisons: The reddish brown dorsal coloration and the wavy dorsal lines separate *procax* from all other races. Some specimens of *chrysolaema* were noted in life as reddish brown, but this is not the usual dorsal coloration of the nominate race. Individuals of *chrysolaema* with this coloration are readily differentiated from *procax* on the basis of the very different dorsal patterns of the two subspecies.

In size, *procax* is closest to *chrysolaema*, although *procax* is distinctly the smaller of the two. *Chrysolaema* is typically a subspecies with 12 rows of ventrals, whereas *procax*, although it has individuals with 12 rows, has a modal condition of 10 rows. *Procax* averages fewer (84.8) fourth-toe scales than *chrysolaema* (86.7), the same as *alacris*, and more than *boekeri* (84.6) and *umbratilis* (83.0). In number of femoral pores, *procax* (36.1) averages far lower than *chrysolaema* (43.7), and slightly lower than *boekeri* (36.5), but slightly higher than *umbratilis* (35.6) and *alacris* (33.8); *procax* is one of the races with a low number of femoral pores. In fifteenth verticil scales, *procax* averages less (42.8) than *chrysolaema* (44.4) and *alacris* (44.0), and is about equal to *boekeri* and *umbratilis* (42.7).

Remarks: *A. c. procax* is presently not known to intergrade either with *boekeri* to the west or the race next to the east along the southern Hispaniolan coast. The easternmost *boekeri* locality (where the population incidentally is almost completely made up of non-patterned individuals) and the westernmost locality of *procax* are separated by only 35 kilometers. As noted in the discussion of *boekeri*, Baní lies about on the dividing line between the xeric Llanos de Azua to the west and more mesic conditions on the east. *Procax* inhabits these eastern more mesic regions, whereas *boekeri* is restricted to the xeric Llanos de Azua.

AMEIVA CHRYSOLAEMA PARVORIS,¹ new subspecies

Holotype: MCZ 77234, an adult male, from 0.9 mi. (1.4 km) E Boca Chica, Distrito Nacional, República Dominicana, one of a series taken 23 August 1963 by Ronald F. Klinikowski, David C. Leber, and Richard Thomas. Original number V649.

¹ From the Latin *parvum* (small) and *os, oris* (mouth), a translation of Boca Chica, the type locality.

Paratypes: All from the República Dominicana, as follows: MCZ 81011-14, USNM 152571-74, AMNH 92850-55, KU 79872-74, UIMNH 55638-39, RT 789-90, same data as holotype; ASFS V669-79, Boca Chica, eastern edge, Distrito Nacional, 23 August 1963, R. F. Klinikowski, D. C. Leber, R. Thomas.

Associated specimens: República Dominicana, San Pedro de Macorís Prov., 0.5 mi. S San Pedro de Macorís, at lighthouse, 11 (ASFS X8181-91); La Romana Prov., Isla Catalina, western end, 4 (ASFS V554-57).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of large size (males to 137 mm, females to 113 mm snout-vent length), usually 12 transverse rows of ventrals, moderate number of fourth-toe subdigital scales and femoral pores, and high number of scales in the fifteenth tail verticil; dorsal pattern of tan to blackish brown ground color with dull yellow spots which may be either discrete or confluent, giving a reticulate appearance (Fig. 4, *left*), lateral fields present and black, or broken to give a tigroid effect, and a black gular band which may be expanded to involve the chest and the undersides of the arms.

Distribution: Coastal southeastern República Dominicana, from Boca Chica on the east to San Pedro de Macorís on the west, and including Isla Catalina; range as here described apparently discontinuous, and *A. chrysolaema* unknown from the mainland opposite Isla Catalina (Fig. 11).

Description of type: An adult male with the following measurements and counts: snout-vent length 129 mm, tail 282 mm; ventrals in 38 longitudinal and 10 transverse rows; fourth-toe subdigital scales 41 and 42 (total 83); femoral pores 19 and 19 (total 38); 44 scales in the fifteenth tail verticil. Dorsal ground color dull blackish brown, with the entire back from the neck to the sacrum covered with dull yellow spots, not aligned into linear series; lateral fields black, not bordered above or below, and invaded by the brown dorsolateral coloration, the entire sides spotted with yellow dorsally and pale blue ventrally. Throat gray, ventral ground color gray. A black gular band which extends slightly onto the chest and also the underside of the arms. Forelimbs faintly spotted with bluish, hindlimbs spotted with dull yellow. Tail grayish brown dorsally, gray ventrally.

Variation: See tables. The dorsal ground color of *A. c. parvoris* varies from blackish brown (type locality) to tan and brown (San Pedro de Macorís). The spotted condition of the black is typical of most specimens, including small juveniles,

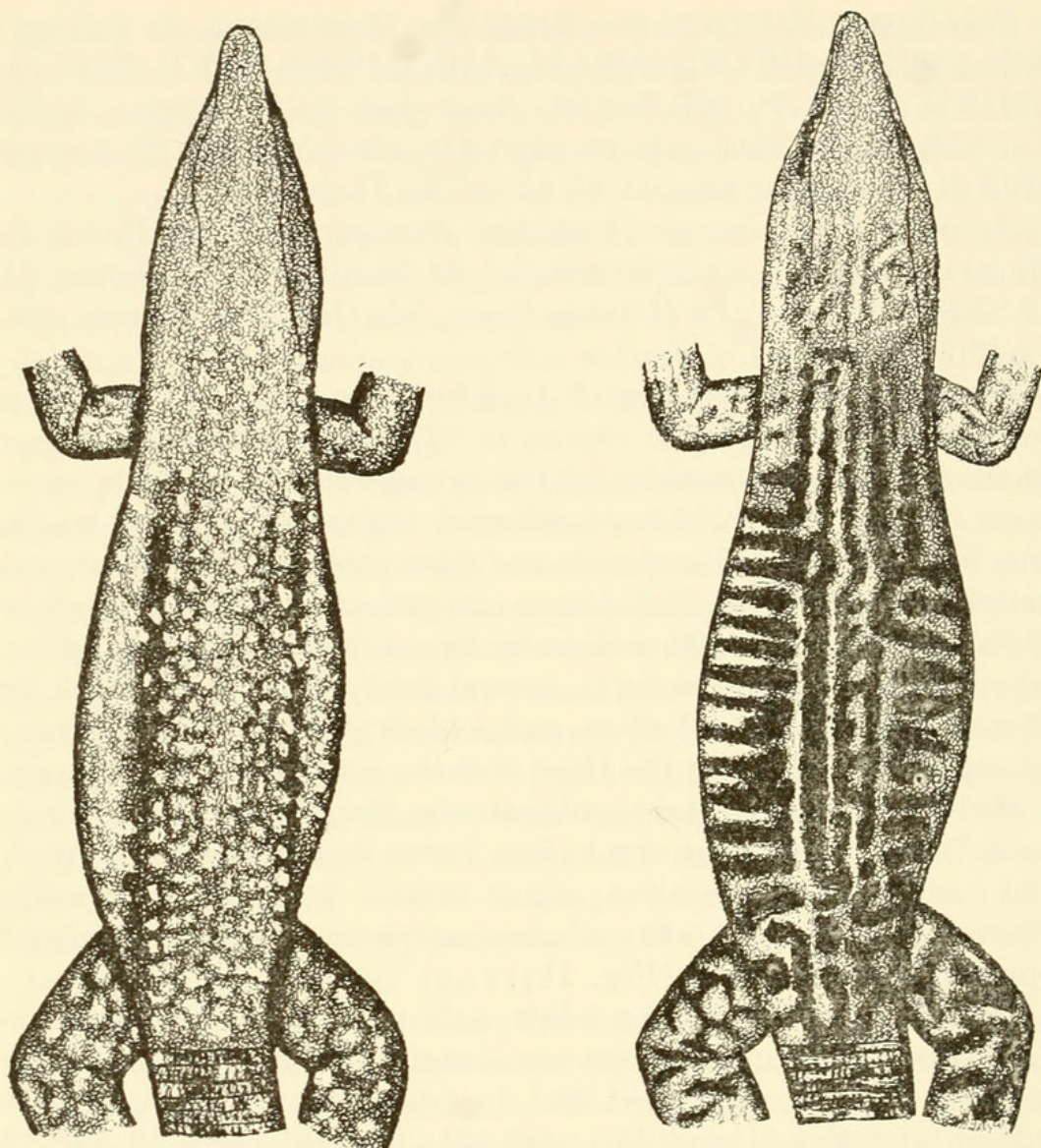


Fig. 4. *Left*, *Ameiva c. parvoris*, holotype, MCZ 77234, 0.9 mi. E Boca Chica, Dist. Nac., República Dominicana. *Right*, *Ameiva c. jacta*, holotype, MCZ 75267, Juanillo, La Romana Prov., República Dominicana.

but others show a more lineate pattern somewhat like that described for *procax* — the dorsal lines broken into dashes giving a wavy appearance. The lateral fields may be obscured as in the type, or may be slightly more prominent, with much encroachment of brown to give an irregular and indefinite edge; at the same time the black lateral field pigment may extend up onto the sides of the back, thereby giving a distinctly tigroid appearance to the sides and dorsolateral regions. In some individuals the dorsal spots are confluent, thereby increasing the tigroid effect by transverse dorsal pale markings. The throat is

grayish to dull orange and the ventral ground color varies from grayish blue to dull, deep orange.

The small series from Isla Catalina resembles the mainland specimens in dorsal pattern and in extent of the gular band, which in *parvoris* may involve the chest and undersides of the arms. The dorsal dots are conspicuously confluent, the lateral fields are obsolete, and the ventral coloration is pale bluish with an orange tint. The most obvious difference in coloration is that the dorsal surfaces of the hindlimbs are rusty — a feature found in no mainland *parvoris*. The Catalina series is composed of one adult male with a snout-vent length of 126 mm and thus a large lizard, and three females (one of which is a small juvenile), the largest of which has a snout-vent length of 112 mm, again a large lizard. The transverse ventrals are 10 in three specimens and 12 in one. In all other features of scalation the Catalina lot falls within the known range of mainland *parvoris*. Additional specimens from Isla Catalina may well reveal that it is inhabited by still another distinctive race; the strikingly rusty hindlimbs are indicative of at least one major color difference between Isla Catalina specimens and mainland *parvoris*.

Comparisons: No other race of *A. chrysolaema* has the back with irregularly arranged and at times confluent spots, and tigroid sides. This feature alone will distinguish *parvoris* from the previous races. In size, *parvoris* is much smaller than *chrysolaema* and slightly smaller than *procax*, but larger than the remaining subspecies. In fourth toe scales, *parvoris* averages less (83.2) than other races except *umbratilis*, which is comparable (83.0). *Parvoris* averages less (38.2) than *chrysolaema* (43.8) in femoral pores, but exceeds the remaining races, all of which have low femoral pore counts. In fifteenth verticil scales, *parvoris* has the same mean as *bockeri* and *umbratilis* (42.7), less than *chrysolaema* and *alacris* (44.4 and 44.0), and almost the same as *procax* (42.8).

Remarks: *A. c. parvoris* is not known to intergrade with *procax* on the west nor with the following subspecies to the east. The easternmost locality for *procax* is separated by 35 kilometers from the westernmost *parvoris* record. It is possible that the Río Ozama may divide these two races of *A. chrysolaema*. The area occupied by *parvoris* does not differ in any obvious way from that inhabited by *procax*.

*AMEIVA CHRYSOLAEMA JACTA*¹ new subspecies

Holotype: MCZ 75267, an adult male, from Juanillo, La Romana Province, República Dominicana, taken 29 March 1963, by Clayton E. Ray and Robert R. Allen.

Paratypes: MCZ 75268-69, same data as holotype.

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of large size (males to 134 mm snout-vent length; females unknown), usually 12 transverse rows of ventrals, low number of fourth toe subdigital scales, moderate number of femoral pores, and very low number of scales in the fifteenth caudal verticil; a dorsal pattern of dark brown to black tigroid markings on a grayish tan background (in preservation), the pattern extending in a diluted fashion onto the neck, a bold, checkerboard-patterned tail (Fig. 4, *right*), and a black gular band which extends onto the chest and underside of the arms.

Distribution: Known only from the type locality in extreme eastern República Dominicana (Fig. 11).

Description of type: An adult male with the following measurements and counts: snout-vent length 134 mm, tail 304 mm; ventrals in 38 longitudinal and 12 transverse rows; fourth-toe subdigital scales 41 and 41 (total 82); femoral pores 21 and 22 (total 43); 35 scales in the fifteenth caudal verticil. Dorsum (preserved) tannish gray with a dark brown, almost black pattern consisting of bold vertical tigroid markings on the sides and about five wide, dark, longitudinal lines on the back, the latter much confused and joined by the lateral vertical markings, giving a rather complete and complex dark brown reticulum, which, although present on the neck, is much paler gray. Lateral fields completely absent, no dotting on sides or back whatsoever. Upper surface of forelimbs with obscure grayish lines and blotches, hindlimbs with a dark brown reticulum enclosing large spots which are pale centrally and darker peripherally. Tail with a bold checkerboard pattern of grayish tan, white, and dark brown, this pattern becoming obsolescent and absent on the distal half of the tail. Belly and throat presently dull grayish orange, with some lateral ventral scales with very dark gray blotches, thereby giving the belly somewhat of a faint checkerboard appearance laterally. Black gular band obsolete but indicated, and anterior ten rows of ventrals clouded with dark gray.

¹ From the Latin for "thrown," an allusion to the far flung distribution of this subspecies.

Variation: See tables. In coloration and pattern the two paratypes are much like the type and require little comment. The major difference is that the paratypes have a bold, black, gular band which involves the chest and the underside of the arms. Neither lizard has any indication of lateral fields, and the sides and back have the tigroid vertical bars and brown to black reticulum, as well as the checkerboard tail, just as described for the type.

Comparisons: *A. c. jacta* does not need detailed comparison of pattern with any other described subspecies; the boldly and vividly marked back with its light ground color will distinguish *jacta* from the remaining races. *A. c. parvoris* is closest to *jacta* in pattern, but the differences are so striking that the similarity between these two subspecies is not very great.

In size, *jacta* is smaller than *chrysolaema*, *procax* and *parvoris*, and larger than the remaining forms. All other races have a higher number of fourth-toe scales and fifteenth verticil scales. *Jacta* has a high mean of femoral pores, having less than *chrysolaema*, and more than the balance of the subspecies.

Remarks: No intergradation is known between *jacta* and *parvoris* to the southwest; the easternmost mainland locality for *parvoris* is separated by 145 kilometers from that of *jacta*. We have attempted to secure specimens of *A. chrysolaema* between San Pedro de Macorís and Juanillo at several localities along the coast (La Romana, Boca de Chavón, Boca de Yuma) as well as inland in this eastern region, without success. Typical xeric *chrysolaema* habitats here are occupied by *A. taeniura*. Considering the likeness of *jacta* to the race from Isla Saona, described below, it is probable that this boldly marked type of lizard was at one time (and still is?) abundant locally in extreme eastern Hispaniola. Presently, the hiatus between *jacta* and *parvoris* and the apparent absence of the species in this eastern region suggests strongly that the populations are relict with a disjunct distribution.

AMEIVA CHRYSOLAEMA RICHARDTHOMASI¹ new subspecies

Holotype: MCZ 77235, an adult male, from the environs of Mano Juan, Isla Saona, República Dominicana, taken 19 July 1964 by Richard Thomas. Original number V3018.

¹ Named for the collector.

Paratypes: ASFS V3019-30, USNM 152575-76, AMNH 92856-58, KU 79875-77, UIMNH 56898-99, RT 935, same data as holotype.

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of large size (males to 137 mm, females to 124 mm snout-vent length), usually 10 (but often 12) transverse rows of ventrals, high number of fourth-toe subdigital scales and femoral pores, and moderate number of scales in the fifteenth caudal verticil; dorsal pattern of two phases: (1) back gray-green with

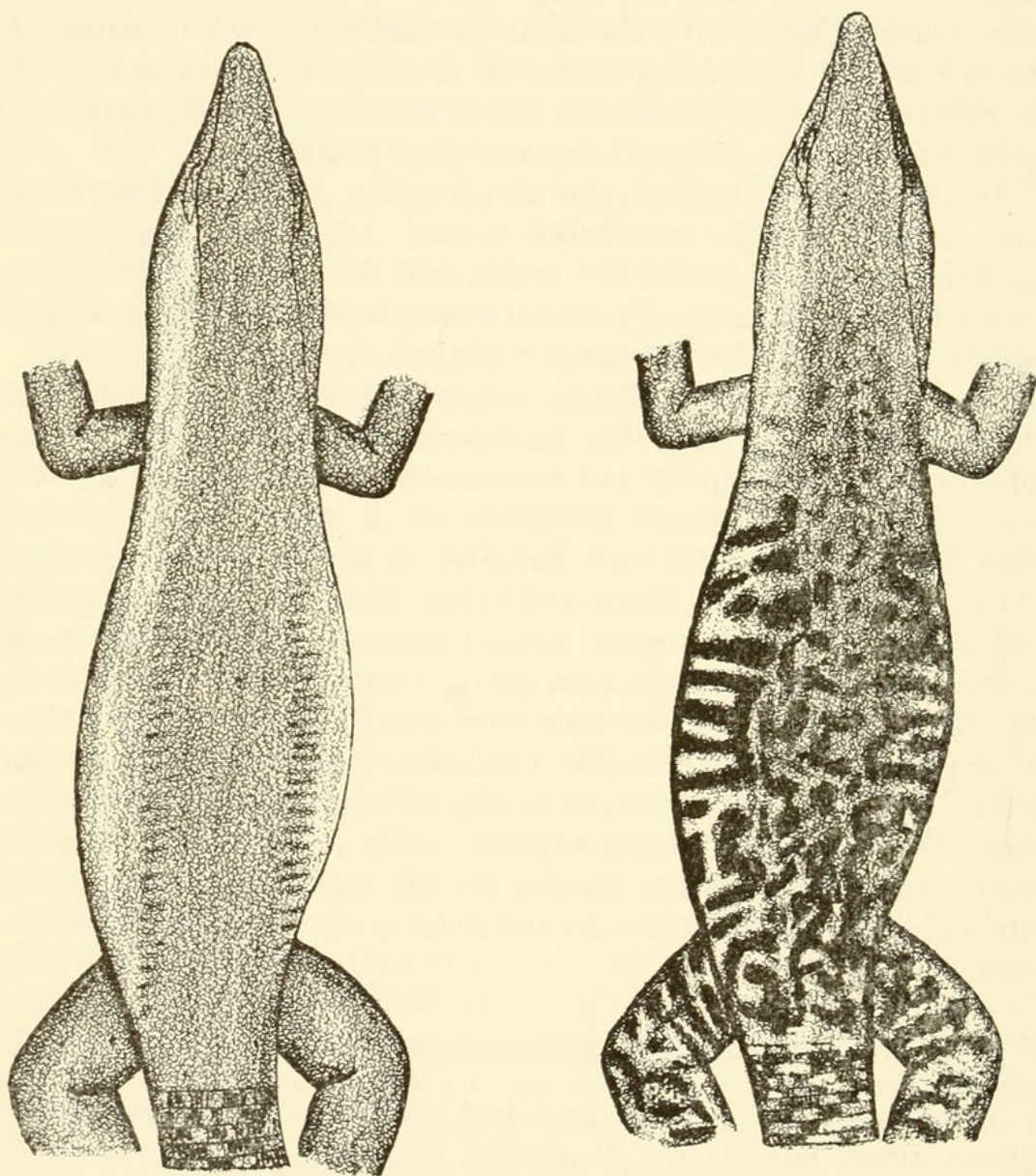


Fig. 5. *Left*, *Ameiva c. richardthomasi*, holotype, MCZ 77235, environs of Mano Juan, Isla Saona, República Dominicana. *Right*, *Ameiva c. richardthomasi*, ASFS V3019, environs of Mano Juan, Isla Saona, República Dominicana.

only an indistinct mottling of gray-brown in the area of the lateral fields or (2) back gray-green with heavy black mottling, no lateral fields, and tigroid vertical bars on the sides, the dorsal mottling not extending onto the shoulders and neck (Fig. 5), and without a black gular band.

Distribution: Known only from the type locality, but presumed to occur throughout Isla Saona (Fig. 11).

Description of type: An adult male with the following measurements and counts: snout-vent length 137 mm, tail 146 mm, twice broken and regenerated; ventrals in 37 longitudinal and 12 transverse rows; fourth-toe subdigital scales 45 on left side; femoral pores 22 and 20 (total 42); 38 scales in the fifteenth tail verticil. Dorsal ground color gray-green (Maerz and Paul: pl. 22F1), becoming finely mottled laterally with a series of very faint grayish brown vertical bars in the region of the lateral fields; lower sides putty colored. Throat and venter orange with no black gular band. Fore- and hindlimbs unicolor with back, and patternless. Tail grayish tan without obvious checkerboard pattern above, putty colored below.

Variation: See tables. Sixteen specimens of *richardthomasi* (including the type) are patternless dorsally and have a finely filigreed, grayish brown area in the region of the lateral fields. The tails are gray to tan without a prominent checkerboard pattern as in the patterned lizards. The venters are orange to drab gray, generally slightly more orange in the pectoral region, and grayer posteriorly. Throat and underside of forelimbs are mottled to nearly unicolor orange, sometimes in discrete flecks. The younger specimens have light gray throats. The underside of the hindlimbs and tail is gray to putty colored with some orange on the anterior surface of the femur, and in some specimens on the entire underside of the hindlimb. Two small juveniles (snout-vent length 47 and 51 mm) are in this patternless phase.

Eight specimens (adults and subadults of both sexes) have patterned backs. In this phase, the dorsal ground color is gray-green with a heavy black mottling and strikingly tigroid barred sides. The black dorsal pattern quickly fades at the shoulders and is absent or very suppressed on the neck. The dorsal blotching is much as that described for *jacta*, i.e., a vermiculate or at times longitudinally arranged configuration of black on a lighter ground. In no specimens are the lateral fields apparent and there is no spotting or dotting on the sides. The bellies of these

patterned lizards were the same as those of patternless specimens; females of the patterned lizards have the extent and intensity of the orange not so great as do the males. The checker-board tail is a common feature.

As in *A. c. boekeri*, we have no doubt that the two phases in *richardthomasi* represent two basic patterns, and in no way should be interpreted as an adult phase versus a juvenile and subadult phase. Although the only two juveniles at hand are patternless, there is an intermingling of sizes of both sexes insofar as the two phases are concerned. Just as in *boekeri*, which is represented by a much longer series, there are no intermediates between the two conditions; each lizard is distinctly in one phase or the other.

Comparisons: The patterned phase of *A. c. richardthomasi* requires comparison only with *A. c. jacta* to which race the former is obviously closely allied. The two can easily be differentiated in that *jacta* has a black gular band and the dorsal pattern continues anteriorly onto the neck, whereas *richardthomasi* lacks a gular band and has the pattern faded anteriorly. *Jacta* also is not known to have a patternless phase.

The patternless phase of *richardthomasi* requires comparison with patternless *boekeri*. The two are much alike, but *richardthomasi* differs in having the filigreed or mottled lateral field area whereas *boekeri* has an obsolete lateral field and no mottling in this region. Also the dorsal hues of *boekeri* populations are usually not greenish.

In size, *richardthomasi* is smaller than *chrysolaema* and *procax*, equal to *parvioris*, and larger than the remaining races. In having a mean of 87.6 fourth-toe scales, *richardthomasi* averages higher than all previously named races. In femoral pore counts, it is higher than all races except *chrysolaema*. Considering fifteenth caudal verticil scales, *richardthomasi* is exceeded by all forms except *jacta*.

Remarks: The close alliance of *richardthomasi* with *jacta* is obvious. If we assume that extreme eastern Hispaniola is (was) inhabited by a population with heavy dorsal mottling and marbling, this population must also have given rise to the Saonan subspecies. We have no evidence that *jacta* or a related form still occurs on the adjacent Hispaniolan mainland. Certainly *richardthomasi* is an insular derivative of an extreme eastern heavily marked form which was likely similar to *jacta*.

AMEIVA CHRYSOLAEMA LEBERI¹ new subspecies

Holotype: MCZ 77236, an adult male, from 5 km E Pedernales, Pedernales Province, República Dominicana, one of a series taken 25 June 1964 by David C. Leber and Richard Thomas. Original number V2509.

Paratypes: All from the República Dominicana, Pedernales Prov., as follows: ASFS V2510-19, USNM 152577-82, RT 932, KU 79878-81, same data as holotype; MCZ 81015-18, UIMNH 56900-05, Pedernales, 3 July 1964, D. C. Leber, R. Thomas; AMNH 92859-61, 1 km E Pedernales, 25 July 1963, R. F. Klinikowski; AMNH 92862-63, 12 km E Pedernales, 25 June 1964, R. Thomas.

Associated specimens: Haiti, Dépt. d l'Ouest, Tean, nr. Saltrou (not mapped), 4 (MCZ 69389-92); Saltrou, 7 (AMNH 50000-04, 50007-08). República Dominicana, Pedernales Prov., Oviedo, 3 (MCZ 58674-76).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of small size (males to 111 mm, females to 104 mm snout-vent length), 10 transverse rows of ventrals, moderate number of fourth-toe subdigital scales and femoral pores, and low number of scales in the fifteenth caudal verticil; a completely patternless rusty brown dorsum, no lateral fields (Fig. 6, *left*), a deep orange-red belly, and a black gular band which may involve the chest and underside of the arms.

Distribution: To the south of the Massif de la Selle and Sierra de Baoruco, from the vicinity of Saltrou in Haiti, east onto the Península de Barahona, to 12 kilometers southeast of Pedernales (Fig. 11). The record from Oviedo is discussed below.

Description of type: An adult male with the following measurements and counts: snout-vent length 103 mm, tail 233 mm; ventrals in 34 longitudinal and 10 transverse rows; fourth-toe subdigital scales 40 and 42 (total 82); femoral pores 21 and 20 (total 41); 40 scales in fifteenth caudal verticil. Dorsum uniform rusty brown anteriorly, becoming gray-brown posteriorly; sides of head reddish brown. Lateral fields absent. Throat orange, ventral ground color brick red, lower sides (and lateralmost two rows of ventral scales) blue. A black gular band, extending onto the first four or five rows of ventrals and onto the undersides of the arms. Tail gray above, off-white below. Dorsum and top of tail completely unpatterned.

¹ Named for one of the collectors.

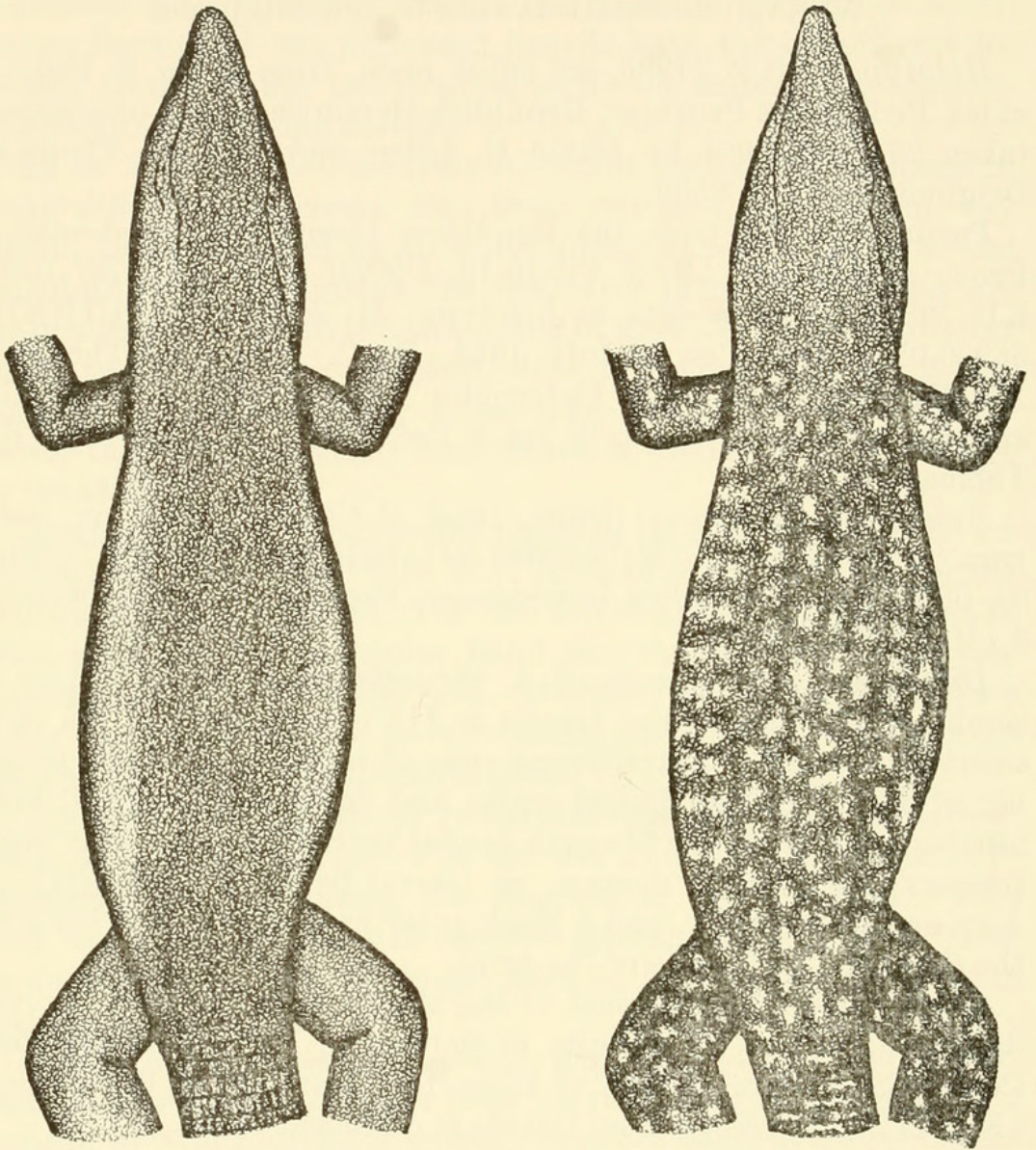


Fig. 6. *Left*, *Ameiva c. leberi*, holotype, MCZ 77236, 5 km E Pedernales, Pedernales Prov., República Dominicana. *Right*, *Ameiva c. ficta*, holotype, MCZ 77237, 13.1 mi. SW Enriquillo, Pedernales Prov., República Dominicana.

Variation: See tables. The dorsal ground color varies from rusty brown to reddish brown, and the ventral ground color from gray with small amounts of red to orange-red, fading posteriorly, to brick red. The gular band is present in all specimens, and in only one male does it not extend onto the chest. The lower sides and lateral two rows of ventrals on each side are blue, or at least have blue flecking, but one small male has the lateral ventrals orange-red like the balance of the venter. The lores and cheeks are unspotted pinkish gray. The tails are gray, unmarked above,

and the undersides of the tails are a grayish off-white. There is no obvious sexual dichromatism.

Comparisons: By virtue of its patternless dorsum, *leberi* can easily be differentiated from all races except patternless *boekeri* and patternless *richardthomasi*. The different dorsal hues of *leberi* and *richardthomasi* (rusty brown versus greenish gray) and the presence of a gular band in the former and its absence in the latter, as well as the larger adult size of *richardthomasi*, all make this distinction easy. From patternless *boekeri*, *leberi* differs in smaller adult size, and in lacking any expression of the lateral fields, whereas *boekeri* retains the fields as obsolete grayish longitudinal smudges. The vivid venters of *leberi* are not found in *boekeri*, and the brighter dorsal ground color of *leberi* contrasts strongly with the more drab tones of *boekeri*.

Leberi is the smallest race of *A. chrysolaema*. In number of fourth-toe scales, *leberi* averages lower (85.5) than *richardthomasi* (87.8) and *chrysolaema* (86.7), and is higher than the remaining subspecies. In femoral pores, *leberi* again averages less (41.3) than *chrysolaema* (43.7) and *richardthomasi* (42.6), the same as *jacta*, and more than in the other races. In fifteenth verticil scales, *leberi* is exceeded by all subspecies except *jacta*.

Remarks: *A. c. leberi* is not known to intergrade with either *chrysolaema* to the north (from whose range it is completely separated by the Massif de la Selle) or with the form to the east on the Península de Barahona. The three specimens from Oviedo noted in "Associated Specimens" above, will be discussed in detail in the treatment of the following subspecies.

AMEIVA CHRYSOLAEMA FICTA¹ new subspecies

Holotype: MCZ 77237, an adult male, from 13.1 mi. (20.8 km) SW Enriquillo, Pedernales Province, República Dominicana, one of a series taken 22 July 1963 by Albert Schwartz and Richard Thomas. Original number X9401.

Paratypes: All from the República Dominicana, Pedernales Province, as follows: ASFS X9402-09, same data as holotype; ASFS X9950, same locality as holotype, 30 July 1963, R. Thomas; ASFS V197-98, same locality as holotype, 4 August 1963, D. C. Leber, R. Thomas.

Associated specimens: República Dominicana, Pedernales Prov., 30 km from Oviedo, road to Pedernales, 1 (MCZ 58673);

¹ From the Latin for "invented, devised," in allusion to resemblances to *abbotti*.

Oviedo, 15 (MCZ 58677-80, 58682-90, 58692-93); 5 mi. (8 km) NE Oviedo, 11 (ASF5 X9957-58, V273-80, RT 752); *Barahona Prov.*, 3 km SW Enriquillo, 1 (ASF5 V290); Enriquillo, 2 (MCZ 58777-78).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of moderate size (males to 121 mm, females to 113 mm snout-vent length), 10 transverse rows of ventrals, low number of fourth-toe subdigital scales, moderate number of femoral pores and scales in the fifteenth tail verticil; dorsum tan to brown, spotted with pale blue, lateral fields obsolescent and often replaced by vertical blackish bars or vermiculations (Fig. 6, *right*), belly rust colored, a prominently checkerboarded tail, and a black gular band often extending onto the chest and underside of the arms.

Distribution: The Península de Barahona from (apparently), 30 km NW Oviedo in the west, east to the east coast in the vicinity of Oviedo, and thence north to Enriquillo (Fig. 11); see however *Remarks* below.

Description of type: An adult male with the following measurements and counts: snout-vent length 112 mm, tail 287 mm; ventrals in 36 longitudinal and 10 transverse rows; fourth toe subdigital scales 38 and 39 (total 77); femoral pores 21 and 20 (total 41); 38 scales in the fifteenth caudal verticil. Dorsal ground color brown, with six longitudinal series of more or less discrete pale blue spots, the lateralmost series bordering above the remnants of the lateral fields, below which is another longitudinal series of pale blue spots; lower sides with alternating vertical black and pale blue bars; forelimbs vaguely spotted with small dots, hindlimbs boldly marked with large rusty spots dorsally. Throat grayish orange, belly rust colored; an extensive black gular band which includes the first eight rows of ventrals and extends onto the undersides of the arms. Tail brown above, with blue spots on the first nine verticils dorsally, and additionally somewhat checkerboarded; tail ivory below.

Variation: See tables. The tan to brown dorsum with pale blue discrete spots characterizes *A. c. ficta*. The spots, on occasion, may be greenish anteriorly or tan posteriorly, but in general they are pale blue. The lateral fields are obsolete or almost completely obliterated by vertical black bars alternating with blue bars on the sides. The throat and ventral ground color are grayish orange and rust, with bellies of females slightly paler than those of males. In some individuals the dorsal spots are distinctly lineate in appearance, and in a few

the back has a more or less complete finely filigreed appearance, although this is not the norm. The spots themselves vary in size, distribution, and density; they may be much smaller than in the type and much more closely appressed to one another, or the paramedian rows (if rows are discernible) may be fused to form a pair of paramedian pale blue lines. The checkerboard tail with blue spotting on its basal portion is a common feature.

Comparisons: Only one other race thus far discussed, *A. c. parvoris*, has a spotted dorsum, although *A. c. chrysolaema* has a pattern of spots and lines. In neither of these two races are the dorsal spots pale blue, but are rather some shade of yellow. In actuality, the pattern of *chrysolaema*, although dotted, bears little resemblance to that of *ficta*; the pattern of *parvoris* is similar but the coloration and general aspect of the lizards of these two races are quite distinctive. *Parvoris* lacks a conspicuously checkerboarded tail.

Compared to the described races, *ficta* is exceeded in size by all other forms except *leberi*, which is still smaller. In number of fourth-toe scales, *ficta* is exceeded by all races except *jacta*. *Chrysolaema*, *richardthomasi*, *jacta*, and *leberi* exceed *ficta* in mean number of femoral pores, and in this character *ficta* exceeds the balance of the races. *Ficta* averages higher in fifteenth verticil scales than *richardthomasi*, *leberi*, and *jacta*, and lower than the other races.

Remarks: The distribution of *A. c. ficta* encompasses the eastern shore of the Península de Barahona from Enriquillo south to Oviedo, and thence inland toward Pedernales for a distance of 30 kilometers. *Ficta* is not known to intergrade with either *umbratilis* to the north or *leberi* to the west (but see below). The northernmost station for *ficta* is 40 kilometers from the closest record of *umbratilis*; we presume that these two races do not come in contact because of the, at best, narrow and intermittent nature of suitable habitats for *chrysolaema* along the east coast of the Península de Barahona.

There are three specimens (MCZ 58674-76) from Oviedo which are clearly *leberi* and in no way resemble *ficta*. Assuming that these specimens did indeed come from Oviedo, they present a problem. They are the only specimens from the entire eastern coast of the Península de Barahona which are patternless; in our considerable collecting experience in the Oviedo region, we never encountered nor collected any *leberi*-like individuals. There are

several possibilities; all of which depend upon the assumed correctness of the locality data for these three specimens: 1) they represent a *leberi*-phase of *ficta*; 2) *leberi* and *ficta* are not both subspecies of *chrysolaema*; 3) *leberi* and *ficta* are both *chrysolaema* derivatives but one has been so long separated from the parent stock that the two forms act as species, with a rather broad (30 km) region of sympatry.

In defense of our arrangement of these two forms as subspecies of *A. chrysolaema*, the following comments are pertinent: 1) There is no incontrovertible evidence that these three lizards are a patternless phase of *ficta*. All of our own Oviedo material is patterned, and there is no indication that there exists a patternless phase of *ficta* (although of course there is this possibility). 2) Since neither *leberi* nor *ficta* intergrades with any other subspecies for reasons of geography, and since both have apparently been long isolated from *chrysolaema* and *umbratilis* to the north, one or both might be logically regarded as a distinct species (if so, then *abbotti* and *ficta* would compose one species, or *leberi* could be so regarded). We feel that *leberi*, despite its complete isolation from *chrysolaema*, is so like patternless *boekeri* and *richard-thomasi* that to regard it as a distinct species would be misleading and obscure its clear relationships to the balance of *A. chrysolaema*. A somewhat stronger case may be made for separating *abbotti* and *ficta* at the species level; here again, however, the resemblance of both these spotted forms to *parvioris* for example (as well as the overall similarities of *abbotti-ficta* to the more northern subspecies) tends in our opinion to negate removing these two forms from the species *chrysolaema*. 3) The most appealing interpretation is that one (*leberi*) of the two involved forms has been long separated from its parent stock (*A. c. chrysolaema*), and that once contact between it and another subspecies (*ficta*) has been re-established, the two forms do not intergrade but act as separate species. The present lack of contact between *leberi* and *chrysolaema* and between *ficta* and *umbratilis* suggests that both forms may well have had long independent histories. It is even not improbable that *ficta* has been derived from *abbotti*, rather than the reverse, and thus *abbotti* may have been insularly isolated from *leberi*. Such a combination of situations might argue for species status for both *leberi* and *abbotti-ficta* and we have considered this possibility. On the other hand, such a decision obscures the obvious relationships of these two forms to *A. chrysolaema* (in contrast, for instance, to *A. taeniura* or *A. lineolata*).

Finally, and probably the most important point is that the region between Oviedo and Pedernales still remains little known herpetologically; there is always the possibility that the presumed *leberi* from Oviedo are in actuality from farther west and thus from within the known range of *leberi*. We have tried to adhere in this case to a *via media*, and rather than make assumptions from inadequate data, we consider both *leberi* and *ficta* subspecies of *A. chrysolaema*, although admitting that the situation is not completely clear. Exclusive of these three questionable lizards, the ranges of *ficta* and *leberi* approach very closely; the distance between the nearest localities for the two races is only 15 kilometers.

AMEIVA CHRYSOLAEMA ABBOTTI Noble, 1923

Ameiva abbotti Noble, 1923, Amer. Mus. Novitates, 64:1 (type locality — Isla Beata, República Dominicana).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of small size (males to 117 mm, females to 108 mm snout-vent length), usually 12 transverse rows of ventrals, high number of fourth-toe subdigital scales and femoral pores, and moderate number of scales in the fifteenth verticil; dorsum black with a pattern of isolated spots which are orange or yellowish, becoming blue anteriorly, lateral field absent, the sides spotted with sky-blue spots (Fig. 7, *left*), venter deep brick red to orange posteriorly, and a black gular band which expands to cover the chest and underside of the arms.

Distribution: Known only from Isla Beata, off the tip of Cabo Beata (Fig. 11).

Discussion: *A. c. abbotti* is the most brilliantly colored and striking of the races of *A. chrysolaema*. The combination of black dorsal coloration, orange to yellowish spots middorsally, becoming blue anteriorly, and the vivid blue lateral spots provides a particularly colorful lizard. The forelimbs are black to brown (distally) with blue spots, and the hindlimbs black with proximally blue and distally orange spots. The venter is brick red, grading to orange or pinkish posteriorly, and the lateralmost ventrals are invaded by blue and white spotting. The heads are tan to orange with white or bluish spots on the sides. There is a bold black pectoral band which extends onto the chest and even onto the venter and the undersides of the arms. The underside of the hindlimbs is orange on the thighs and orange

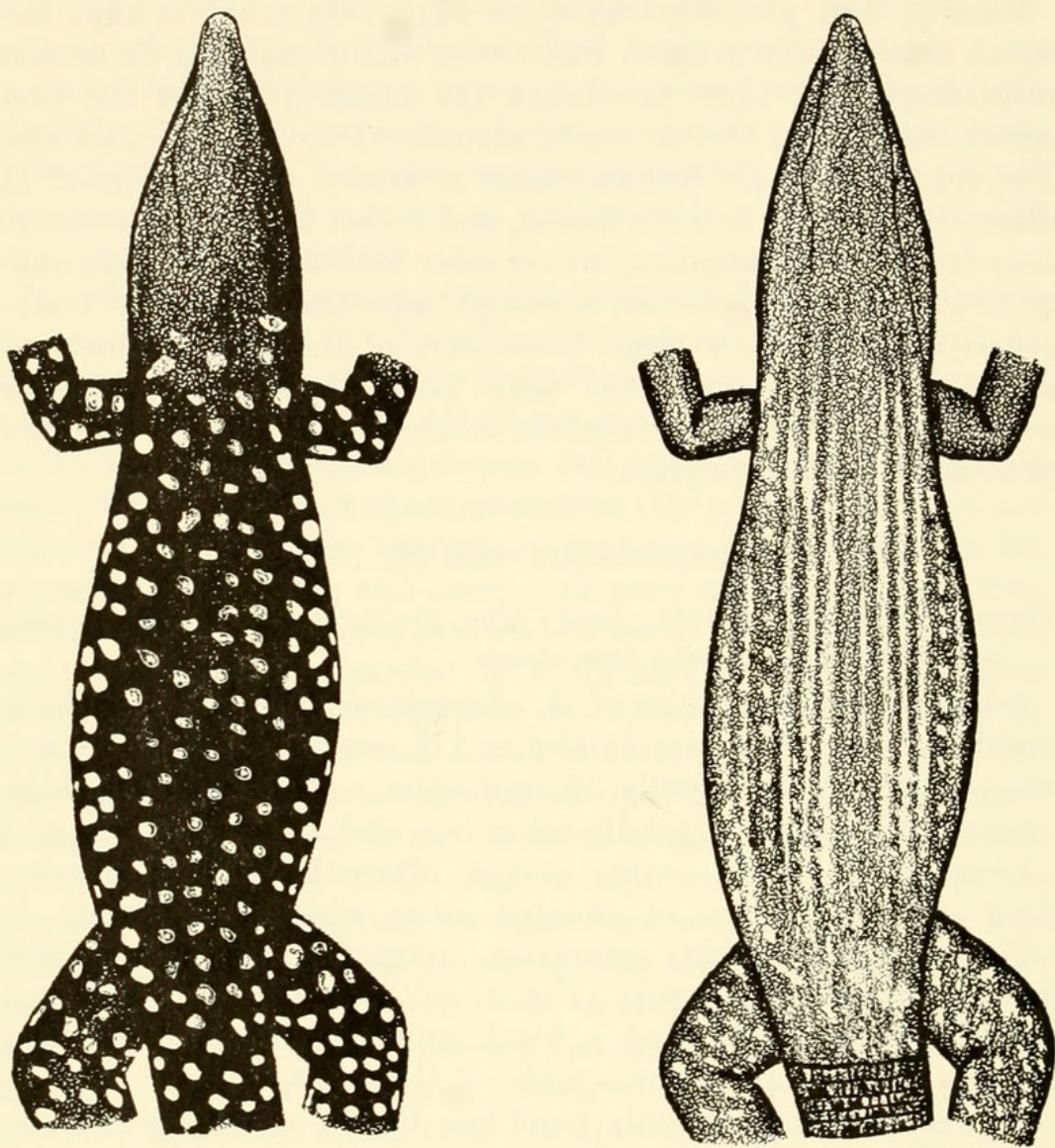


Fig. 7. Left, *Ameiva c. abbotti*, ASFS V2743, Isla Beata, República Dominicana. Right, *Ameiva c. secessa*, holotype, MCZ 77238, Etroits, Ile de la Gonâve, Haiti.

to light tan on the crura. The upperside of the tail is checker-boarded black and white or cream; the underside of the tail is gray to greenish on its proximal half to two-thirds, and uniform light tan to pinkish distally. The dorsal spots are invariably discrete and there is neither a tendency for them to become lineate or to be fused into longitudinal lines. The females are colored and patterned like the males; a juvenile lacks the bright orange ventral color and the black pectoral area.

A. c. abbotti is so very distinctive in its dorsal coloration and pattern that it is hardly necessary to compare it with any other

subspecies. Closest, at least in pattern, are *parvoris* and *ficta*; the former, although a dorsally spotted race, is not so gaudy and lacks the discrete spotting so characteristic of *abbotti*. The adjacent race *ficta*, on the mainland, resembles *abbotti* in basic pattern, but differs in having the back brown rather than black, in having the dorsal spots pale blue rather than orange to yellowish, in having the spots at times arranged into lines, and in having the spotting on the back quite variable in density. In contrast, *abbotti* is surprisingly constant in density of dorsal spotting. *Ficta* is primarily a race with 10 rows of ventrals, whereas *abbotti* usually has 12.

Variation: See tables. *A. c. abbotti* has the highest mean (89.6) of fourth-toe scales of any race described to this point, and is approached only by *richardthomasi* (87.8); of all races of *A. chrysolaema*, *abbotti* has the highest average of femoral pores (43.8), although it is closely approached by *chrysolaema* (43.7). With a mean of 40.4 fifteenth verticil scales, *abbotti* exceeds *ficta*, *richardthomasi*, *leberi* and *jacta*, and has less verticil scales than the other races.

The relationships of *abbotti* are obviously with *ficta* on the mainland. Whether the latter occurs on the southern tip of the Peninsula de Barahona is unknown, but it certainly is a more likely candidate there than the drab and patternless *leberi*, if we assume that *abbotti* was derived directly from the adjacent mainland.

Specimens examined: República Dominicana, Isla Beata, 39 (ASFS V2743-69, MCZ 28571-73, 37578-79, 37581-82, 17676-77, 57049, RT 934, UMMZ 83098).

AMEIVA CHRYSOLAEMA SECESSA¹ new subspecies

Holotype: MCZ 77238, an adult male, from Etroits, Ile de la Gonâve, Haiti, taken 17 July 1962 by Elie Cyphale. Original number X2447.

Paratypes: All from Ile de la Gonâve, as follows: ASFS X2440-46, X2448-59, UIMNH 56906-09, USNM 152583-87, AMNH 92864-69, KU 79882-86, same data as holotype; USNM 80377-78, Pointe Ouest, 21 March 1930, L. H. Parish and W. Perrygo; USNM 77062-69, MCZ 25539-48, Pointe à Raquette, August 1927, W. J. Eyerdam; MCZ 80251-78, Pointe à Raquette, summer 1964, G. Whiteman; MCZ 80231-36, Nan Palmiste, 4 km

¹ From the Latin for "distant, removed."

from Pointe à Raquette, summer 1964, G. Whiteman; MCZ 80237-50, Ti Roche, 0.5 km from Pointe à Raquette, summer 1964, G. Whiteman; USNM 80359-68, 80370-76, UMMZ, 92196, Anse à Galets, 23 March 1930, L. H. Parish and W. Perrygo; MCZ 37568-77, Anse à Galets, 9 April 1934, T. Barbour; USNM 76803, Nan Café, March 1929, A. J. Poole and W. Perrygo.

Associated specimens: *Ile de la Gonâve* (no other locality), 3 (CM 8133, MCZ 12870-71).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of large size (males to 134 mm, females to 111 mm snout-vent length), usually 12 transverse rows of ventrals, high number of fourth-toe subdigital scales, and moderate number of femoral pores and scales in the fifteenth caudal verticil; dorsum reddish brown with six or seven dull buffy longitudinal lines, grayish brown (rather than black) lateral fields with isolated buffy dots enclosed therein (Fig. 7, *right*), and with the black gular band usually absent, or at least very restricted, seldom involving the anterior ventrals but at times extending onto the underside of the arms.

Distribution: *Ile de la Gonâve*, Haiti (Fig. 11).

Description of type: An adult male with the following measurements and counts: snout-vent length, 117 mm, tail 134 mm, broken; ventrals in 39 longitudinal and 10 transverse rows; fourth-toe subdigital scales 45 and 45 (total 90); femoral pores 21 and 21 (total 42); 42 scales in the fifteenth caudal verticil. Dorsal ground color reddish brown with seven dull buffy longitudinal lines, the median line somewhat broken and indistinct; head dull tan, neck greenish; sides of head gray with whitish blotches. Lateral fields grayish brown with an enclosed series of buffy dots, more distinct posteriorly than anteriorly, the lateral fields set off above by the lateralmost dorsal lines, and below by a series of bluish spots; lower sides spotted with blue. Throat dirty pinkish gray, gular band absent, belly gray. Forelimbs with scattered pale greenish blue spots, hindlimbs profusely dotted with pale yellow. Tail reddish brown above, grayish blue below, with some blue scales on the sides.

Variation: See tables. The large series of *A. c. secessa* at hand shows little variation in pattern; the entire animal invariably is quite dull, and the lateral fields are never conspicuous. The longitudinal lines do not contrast especially strongly with the dorsal ground color and in some topotypes are very obscure and are seen with some difficulty. In many specimens there are six

(rather than seven) dorsal lines, the median line being absent. Invariably the gular band is poorly developed or completely absent; if the band is present, it does not involve the anterior ventrals but may send some pigment onto the underside of the arms. The coloration of the venter varies from gray and bluish gray to dull orange-gray. There is no sexual dichromatism.

Comparisons: *A. c. secessa* is so dull and drab compared to all other races that no comparison is really necessary. It differs from the spotted races *parvioris*, *ficta*, and *abbotti* in being longitudinally lined, and from the patternless races *boekeri*, *richardthomasi* and *leberi* in having a pattern. It is much duller patterned, and likewise differently patterned, from the other lined races — *chrysolaema*, *umbratilis*, *alacris*, and patterned *boekeri*. From *jacta* and *richardthomasi* (in the patterned phase), *secessa* differs in lacking the lateral tigroid markings and in having a quite different dorsal pattern. Perhaps the most cogent comparison is with *chrysolaema* which occupies all the adjacent mainland about the Golfe de la Gonâve. From *chrysolaema*, *secessa* can at once be differentiated by its much more drab coloration and pattern, and by the lack of dotting in combination with lines on the dorsum. Both *chrysolaema* and *secessa* are typically 12-row lizards.

In fourth toe scales, *secessa* has a higher mean than any other race, being approached most closely by *abbotti* (89.6). In number of femoral pores, *secessa* is exceeded only by *abbotti*, *chrysolaema* and *richardthomasi*; in fifteenth verticil scales, *secessa*, exceeds *ficta*, *richardthomasi*, *leberi* and *jacta*, and is exceeded by the means of the balance of the subspecies.

Remarks: Although *A. c. secessa* has presumably evolved from the adjacent *A. c. chrysolaema*, in dorsal pattern it grossly resembles *alacris* and *procax*, but is quite distinct in several features, notably the obscure lateral fields and the lack of a gular band. It seems likely that the nominate race has carried the pattern evolution — i.e., disintegration of the longitudinal lines into a series of dots — farther than has the isolated *secessa* which has become faded and pale in contrast to its more brightly colored neighbor. Another possible origin of *secessa* is discussed below.

AMEIVA CHRYSOLAEMA DEFENSOR¹ new subspecies

Holotype: MCZ 63379, an adult male, from Môle St. Nicholas, Dépt. du Nord Ouest, Haiti, one of a series taken 24-29 July 1960 by A. S. Rand and J. D. Lazell, Jr.

Paratypes: All from Haiti, Dépt. du Nord Ouest, as follows: MCZ 63368-72, 63374-78, same data as holotype; MCZ 63364-67, Jean Rabel, 26 July 1960, A. S. Rand and J. D. Lazell, Jr.; AMNH 49856-57, Port à l'Ecu, 1 April 1935, W. G. Hassler; USNM 59925, Baie des Moustiques, 3 May 1917, W. L. Abbott; AMNH 49851-55, river just W Port-de-Paix, 2 April 1935, W. G. Hassler; MCZ 58014, river just W Port-de-Paix, 2 August 1935, W. G. Hassler.

Associated specimens: *Haiti, Dépt. du Nord Ouest*: Bombardopolis, 1 (MCZ 63381); *Dépt. de l'Artibonite*, Gros-Morne, 1 (MCZ 63380).

Diagnosis: A subspecies of *A. c. chrysolaema* characterized by a combination of moderate size (males to 126 mm, females to 106 mm snout-vent length), 10 transverse rows of ventrals, low number of fourth toe subdigital scales and scales in the fifteenth caudal verticil, and moderate number of femoral pores; dorsal pattern a series of six or seven dull longitudinal lines on a tan to brown background, lateral fields dull brown, not especially contrasting with the dorsal ground color and often with the included light spots in the lateral field much reduced or completely absent, a checkerboard tail pattern (Fig. 8, *left*), and no indication of a black gular band, black on the anterior ventrals, or extension of black pigment onto the underside of the arms.

Distribution: The northwest peninsula of Haiti, from Bombardopolis in the south to the vicinity of Port-de-Paix in the northeast, and thence south to Gros-Morne (Fig. 11).

Description of type: An adult male with the following measurements and counts: snout-vent length 118 mm, tail 242 mm, partially regenerated; ventrals in 38 longitudinal and 12 transverse rows; fourth-toe subdigital scales 44 and 44 (total 88), femoral pores 19 and 18 (total 37); 38 scales in the fifteenth verticil. Dorsal ground color (in preservative) dull brown with a series of seven tan longitudinal lines, the median line the least conspicuous, all lines disappearing on the neck. Lateral fields brown, with included tan dots only in their posterior thirds, the anterior

¹ For the Latin for "defender" in allusion to the English fort at Môle St. Nicholas which guarded the Windward Passage.

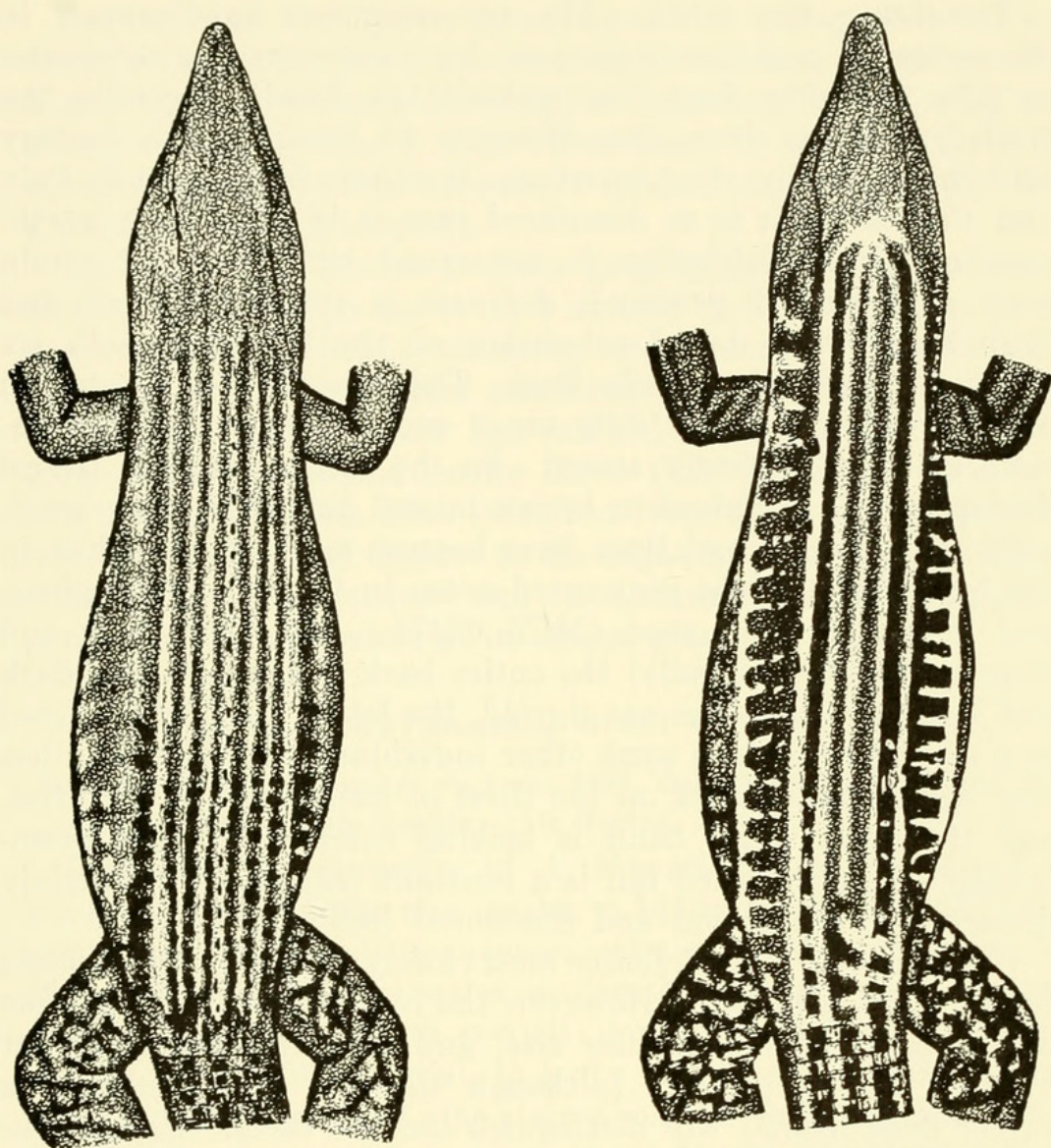


Fig. 8. *Left*, *Ameiva c. defensor*, holotype, MCZ 63379, Môle St. Nicholas, Dépt. du Nord Ouest, Haiti. *Right*, *Ameiva c. woodi*, unnumbered specimen from MCZ 37583-92, Ile de la Tortue, Haiti.

two-thirds being without dots. Forelimbs grayish tan, vaguely dotted, hindlimbs brown with large pale spots, leaving almost a reticulum of dark brown surrounding the large pale areas. Ventral ground color (including throat) bluish gray, no black pigment on throat, chest, or undersides of arms. Lower sides with gray and blue markings which are almost tigroid. Tail tan, heavily checkerboarded with dark brown above, blue-gray marked with cream below, and with black and some cream on sides.

Variation: See tables. We are somewhat handicapped in discussing *A. c. defensor* since we have not seen this subspecies in life. Judging from the material at hand, especially the fresh specimens from the Museum of Comparative Zoology (old material in the American Museum from Port-de-Paix and Port à l'Ecu is so discolored that it is completely worthless insofar as coloration is concerned but does still retain some evidences of pattern), *defensor* is typically a dull and drab lizard with dorsal coloration of tan to brown with six or seven longitudinal buffy lines. The lateral fields are brown and have the included dots much reduced (often absent anteriorly) or completely absent. In the latter case the lateral field presents an unbroken brown lateral band. In some specimens, the longitudinal lines have become more obscure than in the type, due to light pigmented areas in the interline regions, and in one extreme case (MCZ 63378 — snout-vent 119, and thus not the largest male) the entire back is marbled with dark and light and the sides are tigroid, the latter a condition noted to a slighter degree in some other individuals. No specimen has any indication of black on the chest or undersides of the arms, and the gular black band is lacking completely. The prominently checkerboarded tail is a constant feature and is plainly discernible even in old and discolored individuals.

Comparisons: *A. c. defensor* most closely resembles *A. c. secessa* from Ile de la Gonâve. However, the reduced or absent dotting in the lateral fields, smaller size, and the generally somewhat brighter dorsal pattern (although *defensor* is nonetheless a rather drab lizard) will distinguish the two races. *Secessa* usually has 12 rows of ventrals, *defensor* usually has 10. From the patternless races, *defensor* can be distinguished in having a pattern, and from the spotted subspecies by having a dorsal pattern of longitudinal lines. From the other lined races, *defensor* differs in the lack of a black lateral field with included yellow dots, and lack of a black gular band.

In fourth-toe scales, *defensor* (82.4) exceeds only *ficta* (81.9) and *jacta* (79.7); in number of femoral pores, *defensor* (37.2) exceeds only *boekeri* (36.5), *procax* (36.1), *umbratilis* (35.6), and *alacris* (33.8). In fifteenth verticil scales, *defensor* (38.0) exceeds only *leberi* (37.9) and *jacta* (35.7). In counts of fourth-toe scales and fifteenth verticil scales, *defensor* is quite low in the series of subspecies.

Remarks: *A. c. defensor* is not known to intergrade with any other subspecies; there are two wide hiatuses, however. The closest approximation of records for *defensor* (Gros-Morne) and *chrysolaema* (St. Marc) is 83 kilometers. To the east, there are no specimens available between Port-de-Paix and Cap-Haïtien, a distance of 70 kilometers.

Although *A. c. secessa* is closer geographically to *A. c. chrysolaema*, the former is much more similar to *defensor* than to the nominate race. Such a similarity may be merely convergence and may not reflect direct relationships. It is possible, on the other hand, that *defensor* has reached the northwest peninsula from Gonâve; it seems hardly likely that the reverse is true — i.e., that Gonâve has been colonized from the north — considering the proximity of Gonâve to the adjacent mainland (21 kilometers at its closest point) and its distance from the northwest peninsula (72 kilometers at its closest point).

AMEIVA CHRYSOLAEMA WOODI Cochran, 1923

Ameiva chrysolaema woodi Cochran, 1923, Occ. Papers Boston Soc. Nat. Hist., 8:181 (type locality — Ile Tortue, Haiti).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of large size (males to 141 mm, females to 126 mm snout-vent length), 10 transverse rows of ventrals, low number of fourth toe subdigital scales, moderate number of femoral pores and scales in the fifteenth verticil; dorsum very dark brown with three to five dull yellowish to buffy stripes or a median dorsal buffy longitudinal band; the stripes may be variously joined and modified to give rather complex dorsal figures which are derived from the simple five lines (Figs. 8, *right*; 9); sides with vertical tigroid markings, and no black gular band or extensions thereof onto the chest and underside of the arms.

Distribution: Ile de la Tortue, Haiti (Fig. 11).

Discussion: The most strikingly patterned and at the same time most variable of the races is *A. c. woodi*. Basically the dorsal pattern is a series of three to five broad, dull yellowish to buffy longitudinal lines on a very dark brown ground. This basic pattern may be modified in that the area between the two paramedian lines may be filled in with a buffy color so that the back has a lateral pair of pale lines and a middorsal pale zone. From this condition, the balance of the back may be filled in with paler, so that the entire back is marked with a single broad pale middorsal zone. In two individuals, the pale lines have

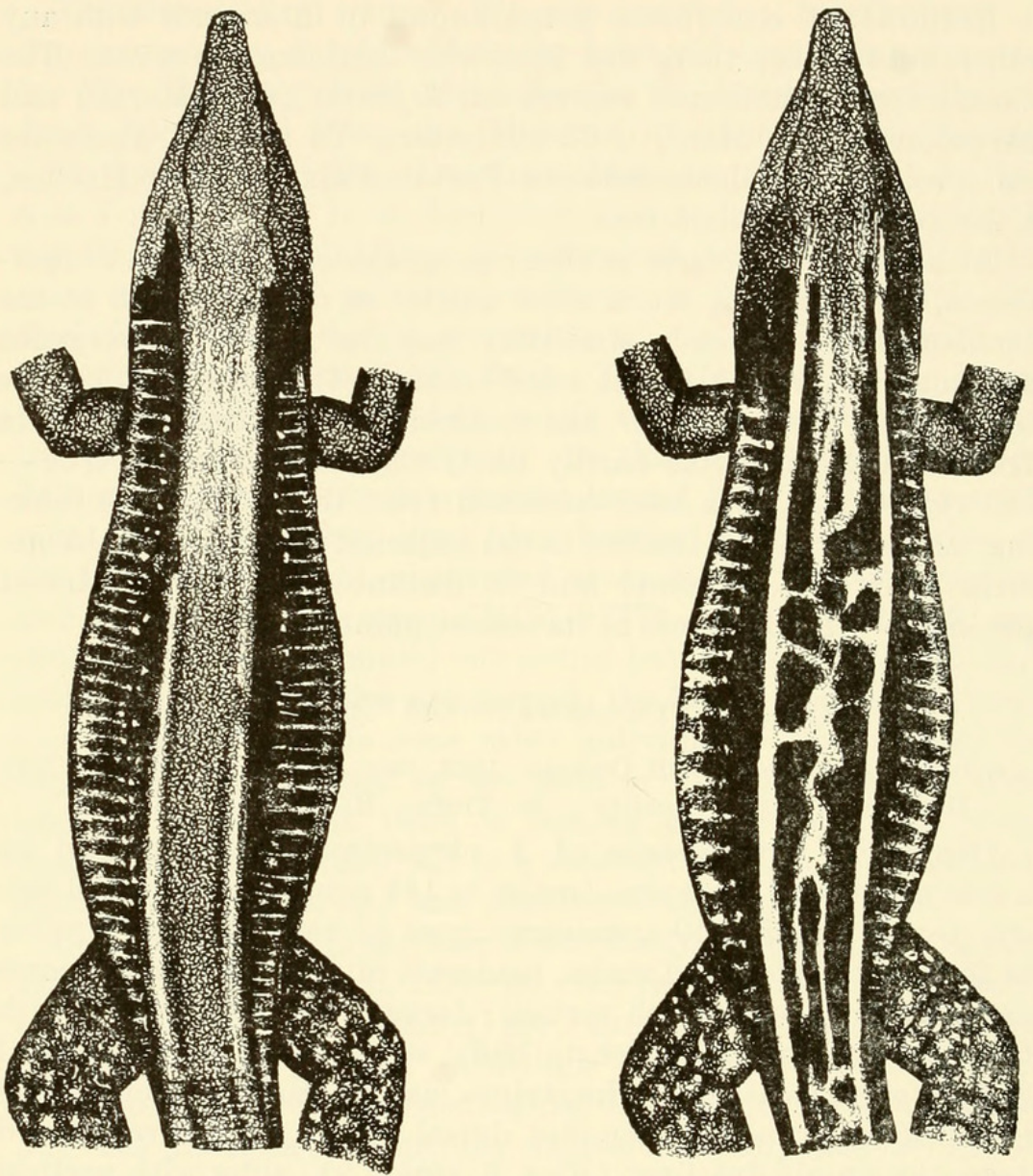


Fig. 9. Left, *Ameiva c. woodi*, ASFS X2270, Palmiste, Ile de la Tortue, Haiti. Right, *Ameiva c. woodi*, ASFS X2267, Palmiste, Ile de la Tortue, Haiti.

grossly fragmented and joined randomly, to form a bizarre, longitudinally reticulate pattern which is quite distinctive. The heads are dull gray-green, with the lores gray. The sides are tan to grayish brown; this lateral color invades the dark brown back to give a series of alternating dark brown and tan vertical tigroid bars, the tan bars often faintly brick colored at their dorsal points. The throats are dirty pale orange, those of the females usually lighter than those of the males (although one female has a brighter orange throat than any other specimen

examined in life). The venter is gray, occasionally with a pale orange wash. No specimen has any indication of a black gular band or any black on the chest and undersides of the arms, although there may be some isolated black flecking on the chest. The tails are tan dorsally, with prominent black markings, giving a strong checkerboard effect. The undersides of the tails are gray and often have almost as prominent checkerboarding as the upper surfaces.

Variation: See tables. In pattern, no other race of *A. chrysolaeama* is comparable to *woodi*; the three to five longitudinal lines are fewer than in the pattern regularly noted in other subspecies, and the peculiar middorsal broad band, either with or without two dorsolateral lines, and the irregular fragmentation and joining of the lines on a dark brown ground are all features which *woodi* shares with no other race. In lacking a gular band, *woodi* is comparable only to the adjacent *defensor*, and *secessa* and *richardthomasi*. All other forms have the band present. *A. c. woodi* is a remarkably distinct form; it resembles none of the mainland races and is particularly unlike the adjacent mainland *defensor*.

A. c. woodi is a large subspecies, being exceeded only by *chrysolaeama* in size, although *procar* is equal in snout-vent length. *Woodi*, in having a low mean (80.5) of fourth-toe scales, exceeds only *jacta* (79.7) in this count. In femoral pore count, *woodi* is exceeded by *abbotti*, *chrysolaeama*, *richardthomasi*, and *secessa*, and has a mean femoral pore count equal to those of *jacta* and *leberi*. The moderate fifteenth verticil count (38.8) of *woodi* exceeds only *richardthomasi*, *defensor*, *leberi*, and *jacta*, and is equal to that of *ficta*.

The derivation of *woodi* must certainly be from the adjacent *defensor* of the mainland. The lack of a gular band, and black on the chest and undersides of the arms, and the ten rows of ventrals are features in common between the two races. There the resemblances cease, however, since *woodi* is a boldly and colorfully patterned lizard, whereas *defensor* is dull and drab. *Defensor* likewise does not exhibit any patterns which are reminiscent of those of *woodi*, although the lack of dots in the lateral fields may foreshadow the absence of these fields entirely in *woodi*.

Specimens examined: Haiti, Ile de la Tortue, Palmiste, 10 (ASFS X2267-76); no specific locality on the island, 29 (MCZ 37583-92 + 19 unnumbered specimens).

AMEIVA CHRYSOLAEMA REGULARIS Fischer, 1888

Ameiva regularis Fischer, 1888, Jahrb. Wiss. Anst. Hamburg, 5:26 (type locality, Sans Souci, Haiti; this locality is the palace of the same name near Milot, Dépt. du Nord, Haiti).

Diagnosis: A subspecies of *A. chrysolaema* characterized by a combination of large size (males to 132 mm, females to 128 mm snout-vent length), usually 12 transverse rows of ventrals, very low number of fourth-toe subdigital scales, moderate number of femoral pores, and high number of scales in the fifteenth verticil; dorsal pattern a series of five to seven pale yellow lines on a tan to brown ground color, occasionally with a clear tan middorsal zone, neck greenish and dorsal ground color often suffused with

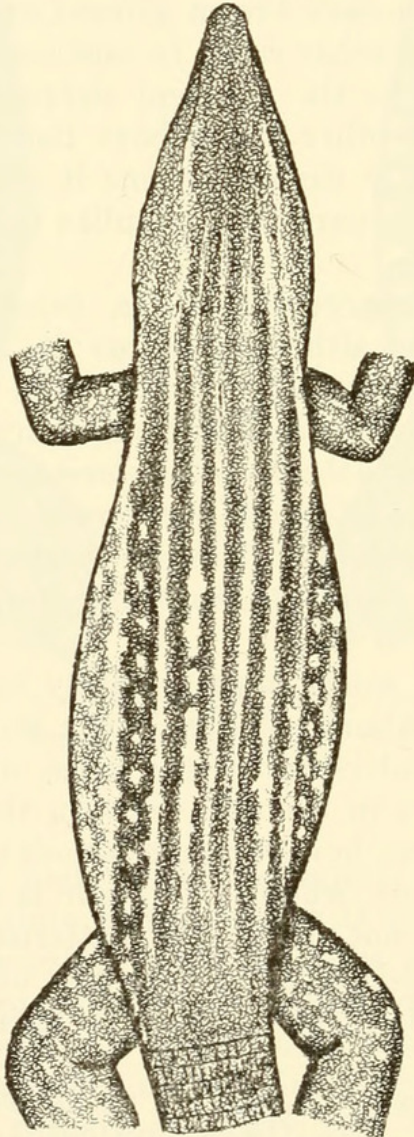


Fig. 10. *Ameiva c. regularis*. ASFS V-1215, 9 km NW Villa Vásquez, Monte Cristi Prov., República Dominicana.

blackish, lateral fields black with an included row of yellow dots (Fig. 10), and black gular band present or absent, when present seldom invading the chest or extending onto the underside of the arms.

Distribution: North central Hispaniola, from Cap-Haïtien and Grande Rivière du Nord in the west, east to Fort Liberté, Haiti, and thence to Monte Cristi and throughout the Valle de Cibao as far east as the vicinity of Santiago, República Dominicana; also the Siete Hermanos islands (known from Isla Muertos, Torurú, Monte Chico, and Tercero) and Isla Cabras to the north of Monte Cristi (Fig. 11).

Discussion: Cochran (1941: pl. 8, figs. B and D) has illustrated two phases in the dorsal pattern of *A. c. regularis* from Cap-Haïtien, which is near the type locality of the subspecies. Generally, throughout its wide range on the mainland, *regularis* is fairly consistent in dorsal pattern. Specimens from the Valle de Cibao, Monte Cristi, and Pepillo Salcedo, which we have seen in life, were brown dorsally, often suffused with blackish, with a greenish wash on the neck, and had five to seven longitudinal pale yellow lines. At times there is a clear tan middorsal zone resulting from fusion of stripes and filling in of the interspaces with tan. The lateral field is black and prominent with a longitudinal series of yellow dots. The lower sides are dotted with blue-green, and the sides of the belly are bright blue. The ventral ground color varies from grayish to deep dull orange, and the throat from yellowish to gray-orange. The forelimbs are spotted with blue-green, the hindlimbs with yellow. The gular band may be either present or absent; if present, it is not extensive and seldom encroaches upon the chest or extends onto the undersides of the arms.

There are variants of the above basic pattern, such as that shown by Cochran (1941: pl. 8, fig. D), in which there are faint filigreed lines in a middorsal zone. Some specimens show accessory dots between the longitudinal lines, especially posteriorly; in the series from near Villa Vásquez, Monte Cristi Province, two in life clearly showed a secondary dorsal condition, similar to that typical of adult *A. c. chrysolaema*, in which the dorsal lines are supplanted by a series of bright yellow dots overlying the fainter longitudinal lines. In general, specimens from near Cap-Haïtien seem somewhat darker than those from the xeric Valle de Cibao, but in features of pattern they are not remarkably different from those from the Valle de Cibao. Occasional

specimens from the western portion of the range of *regularis* have the yellow dots in the lateral fields very tiny, and the field thus appears, grossly, to be immaculate, as is characteristic of some *defensor*.

A series of three adult male lizards from Isla Cabras, off the coast just north of Monte Cristi differs from mainland material in having dark brown lateral fields, and yellow dots on the lower sides. These three specimens also have extensive black gular bands involving the chest and the undersides of the arms. Neither in size nor scalation do there seem to be any differences between these lizards and those from the adjacent mainland. We consider them as *regularis* since in most features of pattern and coloration they are very close to that race.

There are 17 specimens from the Siete Hermanos, a group of seven islets off the mouth of the Río Yaque del Norte. Of these lizards, ten are from Isla Muertos, two from Isla Tercero, two from Isla Torurú, and three from Isla Monte Chico. In coloration, pattern, and scalation they do not differ from mainland specimens, and we regard them as *regularis*.

Variation: See tables. *A. c. regularis* may be differentiated by its lined pattern from the patternless races — *boekeri*, *leberi*, *richardthomasi* — and those which have distinct patterns (dots, vermiculations, etc.) — *parvoris*, *jacta*, *richardthomasi*, *ficta*, *abbotti*. From the lined races, *regularis* differs in lacking a dotted and lined dorsum in combination (*chrysolaema*), in having a dark ground color dorsally and complete and black lateral fields (*defensor*, *secessa*), in almost always lacking a pattern of a mid-dorsal tan zone and at times having a black gular band (*woodi*), and in having twelve rather than ten rows of ventrals (*boekeri*, *alacris*, *procax*, *umbratilis*). *Regularis* most closely resembles *alacris* and *procax*; compared with *alacris*, *regularis* reaches a larger size and averages fewer fourth-toe subdigital scales (77.8 versus 84.8). From *procax*, *regularis* differs in smaller adult size and in often lacking a black gular band, which *procax* regularly possesses. The two subspecies differ in fourth-toe scales, with *regularis* having a lower mean (77.8) than *procax* (84.8).

The north central subspecies is not known to intergrade with either of its neighbors; there are no specimens to the west between Cap Haïtien (*regularis*) and Gros-Morne (*defensor*), a distance of 70 kilometers. The closest approximation of *regularis* (Fort Liberté) and *alacris* (Cerca-la-Source) is 58 kilometers. The intervening mountains almost certainly completely separate these two subspecies.

The distribution of *A. c. regularis* along the northeastern coast of Haiti and thence into the Valle de Cibao in the República Dominicana suggests that this form has evolved along the northern coast and thence has penetrated into the xeric cul-de-sac of the Valle de Cibao. The affinities of *regularis* with *alacris* suggest strongly that the parent stock has been the latter, yet we cannot visualize any means of dispersal of *alacris* to the north Haitian coast; presently at least the Massif du Nord and the Cordillera Central form insurmountable barriers. One route of dispersal suggests itself: the valleys of the Grande Rivière du Nord and the Rivière Bouyaha (the latter a member of the Artibonite system whose upper valleys are occupied by *alacris*) approach each other in the Département du Nord. These valleys and their approximation may have offered a means of ingress for *Ameiva* from the south into the northern Haitian littoral.

Specimens examined: Haiti, Dépt. du Nord, Cap-Haïtien, 14 (USNM 74075-86, MCZ 37593-94); Ti Guinin nr. Cap-Haïtien, (not mapped), 24 (UMMZ 122819 [=12 specimens], MCZ 66527-38); Grande Rivière du Nord, 46 (UMMZ 122820 [=12 specimens], MCZ 63353-63, 66514-26); Fort Liberté, 6 (USNM 76770-75); República Dominicana, Monte Cristi Prov., Laguna de Salodillo, 7 km S Pepillo Salcedo, 1 (ASFS V1430); 4 km E Pepillo Salcedo, 8 (ASFS V1149-55, V1166); Isla Cabras, 3 (ASFS V1372-74); Monte Cristi, 1 (MCZ 58018); 2 km SE Monte Cristi, 5 (ASFS V1210-12, V1284-86); 9 km NW Villa Vásquez, 14 (ASFS V1214-25, RT 811-12); 5 km W Guayubín, 15 (ASFS V1494-508); 7 km N Guayubín, 13 (ASFS V1471-83); Valverde Prov., 9 km N Los Quemados, 1 (ASFS V1766); 7 km E Valverde, 10 (ASFS V2931-40); 2 km E Esperanza, 5 (ASFS V1755-59); Santiago Prov., 7 km W Santiago, 2 (ASFS V2925-26); Santiago and vicinity, 6 (MCZ 58665-66, 58668-71); Siete Hermanos, Isla Muertos, 10 (ASFS V1590-95, RT 826, USNM 76733-35); Isla Monte Chico, 3 (USNM 76715-17); Isla Tercero, 2 (USNM 76736-37); Isla Torurú, 2 (ASFS V1573-74).

DISCUSSION

Before proceeding to a discussion of the variation and possible history of *Ameiva chrysolaema* in Hispaniola, we would like to bring out several facts which seem especially worthy of mention.

The distribution of patternless races, or at least races which have some patternless members (*leberi*, *boekeri*, *richardthomasi*),

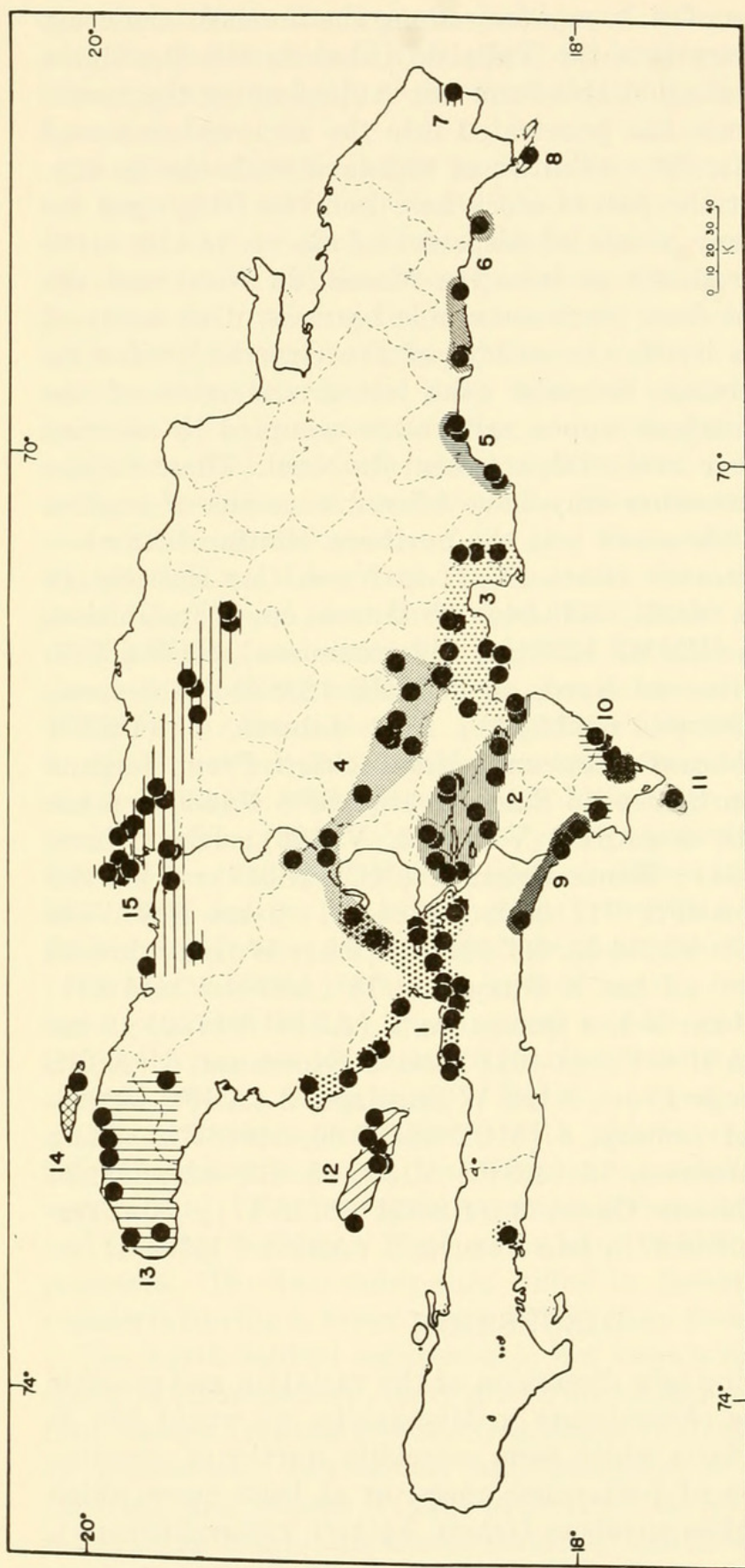


Fig. 11. Hispaniola, showing the known distribution of the races of *Ameiva chrysolaema*, as follows: 1) *chrysolaema*, coarse stippling; 2) *umbratilis*, fine horizontal lines; 3) *bockeri*, open stippling; 4) *alacris*, medium stippling; 5) *procar*, fine vertical lines; 6) *parvioris*, fine diagonal lines; 7) *jacta*, medium horizontal lines; 8) *richardthomasi*, medium diagonal lines; 9) *leberis*, fine crosshatching; 10) *ficta*, medium vertical lines; 11) *abboti*, fine stippling; 12) *secessa*, open diagonal lines; 13) *defensor*, open vertical lines; 14) *woodi*, coarse crosshatching; 15) *regularis*, open horizontal lines. Overlap of symbols of *chrysolaema*, *bockeri*, and *alacris* indicates area of intergradations between these subspecies. Note disjoint ranges of *chrysolaema* (at Aquin) and *parvioris* (on Isla Catalina). Overlap of symbols for *leberis* and *ficta* at Oviedo does not imply intergradation.

is especially interesting. Of these subspecies, one (*leberi*) is isolated on the south shore of Hispaniola below the La Selle-Baoruco massifs; *leberi* approaches, insofar as known without intergradation, the very different patterned race *ficta* on the Península de Barahona. Another (*boekeri*) has patterned individuals, and is surrounded by three patterned races, of which it intergrades with one (*alacris*), is separated from another (*umbratilis*) by the Río Yaque del Sur, and from the third (*procax*) by a distinct and dramatic change of environment. Finally, *richardthomasi* on Saona has patterned and patternless individuals; this subspecies is related most closely to *jacta*.

Three races are dorsally spotted: *abbotti* and *ficta* on Beata and the Península de Barahona, respectively, and *parvoris* on the southeastern coast of Hispaniola. *Parvoris* is separated from its neighbor to the west, *procax*, by the Río Ozama, and from its eastern neighbor, *jacta*, by a wide gap which is apparently presently uninhabited by *A. chrysolaema*. The occurrence of *parvoris* on Isla Catalina, to the east of the known mainland distribution of that race, is noteworthy.

Of the striped races, *chrysolaema* stands alone in its large size and its style of dorsal patterning, a combination of lines and dots. *Chrysolaema* is known to intergrade with *alacris*, another striped race, in the vicinity of Mirebalais, but no intergrades are known between *chrysolaema* and *umbratilis* in the Cul de Sac-Valle de Neiba. *Umbratilis* resembles the striped phase of *boekeri* to some extent; the two are not known to intergrade. The races *procax*, *alacris*, and *regularis* are all comparably striped; of them, *alacris* and *procax* have 10 rows of ventrals, whereas *regularis* has 12 rows of ventrals. The range of *alacris* is separated from that of *procax* by the intervening and quite different *boekeri*. *Defensor*, by virtue of its pallid coloration and drab pattern, stands alone among the mainland races, but it is approached somewhat by the drab *secessa* from Gonâve; *secessa* has 12 rows of ventrals, *defensor* 10. The Tortue subspecies *woodi* is very distinctive, but logically must have been derived from either *defensor* or *regularis*, the only two races on the north coast.

The Sierra de Neiba and the Montagnes du Trou d'Eau form the northern boundary of the Cul de Sac-Valle de Neiba plain, which is in actuality a fossil strait that once separated Hispaniola into two distinct islands, the north and south islands. The south side of the same plain is bounded by the Massif de la Selle and its associated northern ranges (Morne l'Hôpital, Mont

des Enfants Perdus) and the Sierra de Baoruco. Considering only this region, one is struck by the amazing diversity of the four races of *A. chrysolaema* associated with it: *chrysolaema* in the northwest, *umbratilis* in the northeast, *ficta* in the southeast and *leberi* in the southwest. Here we are involved with four races whose patterns are radically different — *chrysolaema* dark with longitudinal lines and dots, *umbratilis* pale with lines, *ficta* with large dorsal spots, and *leberi* without pattern.

It has become customary to catalogue, if possible, Hispaniolan reptiles and amphibians into either north or south island species — i.e., depending upon their present and presumed past distribution. Although this is somewhat difficult in the present case, we feel that *A. chrysolaema* is a north island species. Except for the isolated occurrence of *A. c. chrysolaema* at Aquin on the Tiburon Peninsula (based on a single specimen), this southwestern extremity of Hispaniola lacks the species; the otherwise westernmost record is from Père, near Léogâne. The occurrence of the very different race *ficta* on the Península de Barahona (and its relative *abbotti* on Beata), as well as *leberi* to the west along the south coast, indicates that the *A. chrysolaema* stock was long isolated on the southeastern portion of the south island, where *ficta* evolved in isolation from the northern mass of the species. The presence of *leberi* along this south shore is most puzzling, especially since it is geographically closest to *ficta* (see *Remarks* under *A. c. ficta* for additional comments), and since it also resembles *boekeri* far to the northeast. Perhaps *leberi* is the more ancient of the two mainland south island races, and its present rather restricted distribution a mere remnant of a range which was once more extensive, especially to the west toward Jacmel. If such is the case, *leberi* might be regarded as a subspecies derived from (pre)*chrysolaema*; a possible source of colonization from the northern shore of the Tiburon Peninsula might be the Vallée de Trouin, the low pass between the north and south shores of the peninsula. It is of course quite possible that additional collecting in the vicinity of Jacmel or between that city and Saltrou will reveal the presence of *leberi*; it is also possible that *chrysolaema* or *chrysolaema* × *leberi* intergrades may be found in the Vallée de Trouin as well.

On the north island, and including the Cul de Sac-Valle de Neiba, we visualize the old coast inhabited by two races, *chrysolaema* and *umbratilis*, much as today *procax* and *parvoris* occur along the south shore of the eastern República Dominicana. With

the closure of the strait, each of these races has expanded into the resulting xeric plain, although to the northwest along the Golfe de la Gonâve, *chrysolaema* still occupies the narrow coastal plain and adjacent xeric foothills much as it may formerly have done farther south. Once across the plain, *chrysolaema* has extended its range inland to some extent (Pétionville), and to the west (Père, Momance). *Umbratilis*, on the other hand, has not been able to penetrate far into the adjacent mountains, although it does reach an elevation of 1000 feet near El Naranjo. The range of *umbratilis* is bounded on the north by the valley of the Río Yaque del Sur.

To the east of the Río Yaque del Sur are a series of four, more or less coastal, races. Of these, *boekeri*, immediately to the north and east of the Yaque, is rather like *umbratilis* in its patterned phase. We consider *boekeri* as a direct derivative of *umbratilis* and restricted to the Llanos de Azua. The next three races — *procax*, *parvoris*, *jacta* — show increasingly scattered patterns of distribution to the east, with *jacta* apparently the most isolated. As noted previously, *procax* and *boekeri* approach one another in the vicinity of Baní, precisely in the area of rapid transition from the xeric Llanos de Azua to the more mesic coastal areas to the east. The Río Ozama separates *procax* from *parvoris*, which is known from only two localities on the mainland and from a slightly differentiated population on Isla Catalina. We consider *boekeri*, *procax*, and *parvoris* as a more or less sequential coastal series still maintaining its integrity in response to environmental and geographical influences.

Jacta, on the other hand, along with *richardthomasi*, represents a very different sort of lizard. We feel that the *jacta-richardthomasi* populations at one time (and perhaps still) occupied most of the extreme eastern end of the island. The presently restricted and scattered distribution and records for not only *jacta* but also *parvoris*, as well as the isolated occurrence of *parvoris* on Catalina, suggest strongly that the range of *A. chrysolaema* in this region is retracting, leaving isolated outliers which may be indicative of former populations. The absence of records of the species between San Pedro de Macorís and Juanillo, as well as only two general localities of *parvoris* on the mainland, add substance to this supposition. The eastern distribution of *Ameiva lineolata* tends also to bear out this contention.

Of the remaining races from the southern part of the north island, only the striped *alacris* is left. *Alacris* is so like *procax* in many features that it is difficult not to associate the two. On the other hand, they are separated presently by *boekeri*, with which race *alacris* intergrades, as it does with *chrysolaema* on the west. It is possible that *alacris* and *procax* were at one time confluent, but that *boekeri* has pushed between them, thereby severing any direct genetic continuity between the two. Another possibility is that *alacris* has been derived from *chrysolaema*, either across the Montagnes de Trou d'Eau or along the valley of the Rivière de l'Artibonite. Continued evidence of intergradation between these two races near Mirebalais lends support to this possibility.

A. c. defensor on the northwestern peninsula has obviously been long isolated from its more southern relatives. Presumably it has been derived from *chrysolaema*. The Gonâve race *secessa* resembles *defensor* in pattern and coloration, and it is possible that Gonâve was colonized from the north (*defensor*) rather than from the adjacent mainland (*chrysolaema*). The latter, however, seems more likely both on the basis of proximity and what is presently known of the origin of the Gonâve herpetofauna.

The relationships of *regularis* seem closest to the *procax-alacris* pair; possibility of origin of *regularis* from *alacris* via the Artibonite system and thence to the Grande Rivière du Nord has already been discussed. Other possibilities are an old origin from *defensor* (although this is not particularly appealing) or an origin from *procax* via the central valley to the east of the Cordillera Central in the República Dominicana. The only evidence against this is that *A. chrysolaema* does not occupy this valley today, although *procax* occurs at its southern end and *regularis* at its northern end near Santiago.

Finally, *A. c. woodi* on Tortue, although closer geographically to *defensor* than to *regularis*, seems closer in some characteristics to *regularis* than to *defensor*. There are, however, tendencies of pattern in *defensor* which herald the extreme peculiarities of *woodi* patterns. On the other hand, occasional *regularis* have dorsal patterns like some *woodi*. It seems more likely that *woodi* is a direct derivative of *defensor*.

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Subspecies	♂	♀
<i>chrysolaema</i>	160	130
<i>woodi</i>	141	126
<i>procax</i>	141	116
<i>richardthomasi</i>	137	124
<i>parvoris</i>	137	113
<i>secessa</i>	135	111
<i>jacta</i>	134	—
<i>regularis</i>	132	128
<i>umbratilis</i>	130	112
<i>boekeri</i>	126	111
<i>alacris</i>	126	109
<i>defensor</i>	126	106
<i>ficta</i>	121	113
<i>abbotti</i>	117	108
<i>leberi</i>	111	104

Table 1. Subspecies of *Ameiva chrysolaema* ranked according to snout-vent length (in mm) of largest male for each race.

Subspecies	N	Transverse ventrals	
		Mean and extremes	(mode)
<i>secessa</i>	50	91.0 (80-99)	12
<i>abbotti</i>	32	89.6 (84-97)	12
<i>richardthomasi</i>	22	87.8 (80-92)	10
<i>chrysolaema</i>	106	86.7 (76-101)	12
<i>leberi</i>	48	85.5 (78-96)	10
<i>alacris</i>	48	84.8 (77-94)	10
<i>procax</i>	51	84.8 (76-98)	10
<i>boekeri</i>	86	84.6 (73-98)	10
<i>parvoris</i>	42	83.2 (76-92)	12
<i>umbratilis</i>	61	83.0 (73-100)	10
<i>defensor</i>	24	82.4 (77-90)	10
<i>ficta</i>	41	81.9 (75-92)	10
<i>woodi</i>	39	80.5 (66-93)	10
<i>jacta</i>	3	79.7 (77-82)	12
<i>regularis</i>	140	77.8 (67-88)	12

Table 2. Subspecies of *Ameiva chrysolaema* ranked according to means of number of fourth-toe subdigital scales; each race is also characterized by the modal number of transverse rows of ventral scales (but see discussions of *umbratilis*, *procax*, and *richardthomasi*). N = number of specimens examined.

Subspecies	Femoral pores Mean and extremes
<i>abbotti</i>	43.8 (35-52)
<i>chrysolaema</i>	43.7 (33-50)
<i>richardthomasi</i>	42.6 (39-47)
<i>secessa</i>	41.5 (36-46)
<i>jacta</i>	41.3 (39-43)
<i>leberi</i>	41.3 (35-45)
<i>woodi</i>	41.3 (36-46)
<i>ficta</i>	40.9 (33-47)
<i>parvoris</i>	38.2 (24-45)
<i>regularis</i>	37.6 (32-44)
<i>defensor</i>	37.2 (30-41)
<i>boekeri</i>	36.5 (31-41)
<i>procax</i>	36.1 (30-43)
<i>umbratilis</i>	35.6 (28-42)
<i>alacris</i>	33.8 (30-39)

Table 3. Subspecies of *Ameiva chrysolaema* ranked according to mean number of femoral pores; N = same as in Table 2.

Subspecies	Scales in 15th caudal verticil Mean and extremes
<i>chrysolaema</i>	44.4 (37-51)
<i>alacris</i>	44.0 (39-49)
<i>regularis</i>	43.1 (30-52)
<i>procax</i>	42.8 (39-48)
<i>boekeri</i>	42.7 (37-48)
<i>umbratilis</i>	42.7 (38-48)
<i>parvoris</i>	42.7 (38-46)
<i>abbotti</i>	40.4 (36-47)
<i>secessa</i>	40.1 (36-44)
<i>ficta</i>	38.8 (36-46)
<i>woodi</i>	38.8 (34-43)
<i>richardthomasi</i>	38.6 (36-41)
<i>defensor</i>	38.0 (34-41)
<i>leberi</i>	37.9 (34-43)
<i>jacta</i>	35.7 (35-36)

Table 4. Subspecies of *Ameiva chrysolaema* ranked according to mean number of scales in fifteenth caudal verticil; N = same as in Table 2.



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