

## The Herpetofauna of the Caribbean Islands San Andrés and Providencia

by

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In connection with his Central American studies, the late E. R. DUNN (4) published a preliminary list of the amphibians and reptiles of the two Caribbean islands of San Andrés (12° 30' to 36' N, 81° 42' to 44' W) and Providencia (13° 19' to 24' N, 81° 21' to 23' W). In 1948 the Catherwood-Chaplin West Indies Expedition visited these islands, and with L. H. Saxe, Jr., who personally collected additional specimens, Dr. Dunn in 1950 published a revised and enlarged study of the herpetofauna of the island (5). The purpose of the present work was to reobserve the herpetofauna of San Andrés and Providencia after a 13-year lapse and, where necessary, to revise and supplement the observations of DUNN and SAXE.

San Andrés and Providencia are 300 miles from the Colombian coast and 110 miles from the mainland of Central America. San Andrés is a limestone island eight miles long and two miles wide, covered almost completely with coconut palms from sea level to its highest point of 340 feet toward the northwest. At the north end of the island are small areas of mangrove swamp, and the west coast is characterized by low cliffs of dark gray lithified marl. On the east, white sandy beaches face a shallow coral lagoon. Four small coral cays are found within the lagoon, and coconut palms are the only vegetation supported by them. Providencia, 55 miles northeast of San Andrés, is a rugged island of igneous rock surrounded by a submerged fringing coral reef. It is five miles long and three miles wide, and from a central peak reaching 1190 feet radiate ridges which terminate around the coast at elevations to 500 feet. In the higher regions bracken and tree ferns are common, and in the lower valleys introduced guinea grass (*Panicum maximum*) supports a few cattle. Coconut palms are found on isolated sandy

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beaches, and extensive mangrove swamps occupy much of the northeast shore. In rocky, steeper areas of the island dense thickets of fique (*Fourcroya* sp.), calabash (*Crescentia* sp.) and other trees abound. Small patches of yuca, plantain, banana, sugar cane and fruit trees such as orange, avocado and papaya are found on both islands.

The climate of the islands is tropical, the average daily temperature about 80° F throughout the year. October and November are normally the rainiest months, March and April the driest. For the period 1934-1943 San Andrés had an average annual rainfall of 71.81 inches (Servicio de Meteorología de Colombia, 11, 12).

Collections on San Andrés were made January 6-9, 1961, during which time the most intensive work was done in the area between Old, Chapman and German points on the north shore. On Providencia collections were made January 10-16, 1961, mostly in the region between Ironwood Hill and Rocky Point on the eastern shore of the island. These collecting periods fell shortly after the end of the wet season.

### ACCOUNTS OF SPECIES

DUNN and SAXE (5) listed 15 species for these islands. We collected 13 species, 11 from Providencia and five from San Andrés. One snake (*Coniophanes andreensis*) recorded from San Andrés was not collected, and another (*Micrurus nigrocinctus*) we consider not to be among the fauna of the islands. DUNN and SAXE state that the only positive evidence for the occurrence of the coral snake on Providencia is from a statement of a local resident. We questioned many people in various parts of Providencia and San Andrés, and none had seen or heard of a coral snake on the islands. In the catalogue of the U. S. National Museum, a snake from Old Providence is recorded as "*Elaps nigrocinctus*", taken by the Albatross Expedition in 1884 and subsequently lost. If present on Providencia, the coral snake has since become extinct.

All measurements are in millimeters, and specimens are in the Natural History Collection of the University of the Andes, Bogotá, Colombia.

*Leptodactylus insularum* Barbour. Providencia, 10; San Andrés, 12. In San Andrés this frog is abundant in moist to wet habitats. Isolated individuals were heard calling at night and in mornings before noon from mangrove swamps. Several were taken by turning over palm fronds or logs during the day. At night they were taken near swamps or water holes and were seen as far as 300' from the swamps in grass areas. We did not hear them call on Providencia; there solitary individuals were taken at night from the banks of a shallow stream.

Specimens from the two islands did not differ in coloration or pattern, but frogs from Providencia were larger in body size, averaging 83.5 in snout-vent length as compared to 70.1 in specimens from San Andrés. DUNN and SAXE (5) used the name *L. bolivianus* for the island populations, but MINTON and SMITH (8) restrict the name *L. bolivianus* to southern populations near the

type locality (Bolivia) and use *L. insularum* for the Central American and northern South American populations.

*Kinosternon scorpioides albogulare* Duméril & Bocourt. San Andrés, 1. A specimen was taken during the day from a shallow temporary rainpool at San Andrés. This turtle is said to be common in San Andrés but is unreported from Providencia. Characters of the specimen, a male, are given below: length gular shield / length anterior lobe of plastron, 55.0; width of pectoral suture / length anterior lobe of plastron, 8.8; length femoral suture / length posterior lobe of plastron, 10.9. The posterior part of the carapace of the specimen is eroded, and the dorsal surface is flat. The axillary and inguinal shields are in contact, the posterior lobe of the plastron is not notched, and the lower jaw is streaked. According to DUNN and SAXE (5), these characters are possessed in common with Costa Rica specimens.

*Geochelone carbonaria* Spix. Providencia, 1. This turtle, which is not found on San Andrés, is feral in the hills and higher regions of Providencia, and the specimen was taken from one of the higher peaks of the island. It is called "hickety" by local residents and is used for food by the poorer families.

DUNN and SAXE (5) reported this turtle from Providencia and applied the name *Testudo denticulata* (= *Geochelone denticulata*) to the population. WILLIAMS (14), however, found that two sympatric forms were being confused under the name "denticulata" and separated these into two species, a larger *G. denticulata* and a smaller *G. carbonaria*. Both species occur in South America, and the latter has been recorded from Colombia, Venezuela, British Guiana, Surinam and Brazil. After examining photographs of the Providencia specimen, Dr. Walter Auffenberg informed us that the Providencia population belonged to the smaller rather than the larger species.

The specimen, which has a head-tail length of 215 and a carapace length of 145, has the femoral median suture (32.0) larger than the humeral median suture (26.5) and the inguinal scute broadly in contact with the femoral on the ventral plane of the plastron as described by WILLIAMS (14).

*Sphaerodactylus argus andresensis* Dunn & Saxe. San Andrés, 2. This gecko was frequently seen with anoles on the basal portions of palm and banana trees. The specimens, a male and a female, were found in cavities between truncated frond husks of the common palm of the island. Many were seen, but their elusiveness prohibited the capture of additional specimens.

DUNN and SAXE (5) had five specimens, three of which were adults, and because of differences between this population and populations from Jamaica, Honduras and Grand Cayman, they described a new subspecies. Except for minor differences, our specimens agree with the original description. The total length of the male is 30 and that of the female is 33, and although there is no difference in background coloration between the two specimens, the dorsal pattern is dif-

ferent in the two sexes. In the female the dorsal pattern is reticular, becoming regular in the sacral region and forming four longitudinal dark lines toward the tail. The two median lines fuse on the base of the tail to form a median stripe continuing on the tail. In the male the dorsal pattern consists of individual dark spots, and although lines are formed dorsally at the base of the tail, they are broken and indistinct. DUNN and SAXE found no differences in coloration between adults of the two sexes in their series, but until additional specimens of both sexes are available, it cannot be stated with certainty that this difference is dimorphic.

*Aristelliger georgeensis* (Bocourt). Providencia, 19. This large gecko, called "screeching lizard" by the islanders, is abundant on Providencia. They are usually seen in large trees, in houses and other buildings. We did not see them on San Andrés, but DUNN and SAXE (5) had a single specimen from that island.

*Anolis concolor concolor* Cope. Providencia, 11; San Andrés, 9. On San Andrés this anole is abundant on palm and banana trunks and on palm frond husks. On Providencia it was seen on the trunks of all large trees and in the foliage of thickets. This is the only reptile on Haines Key near San Andrés and is common on Crab Key near Providencia. It is called "little brown lizard" on San Andrés and "paeny" on Providencia.

The specimens from San Andrés are identical with those from Nicaragua, but those from Providencia, although not differing in scalation, relative proportions or color, are smaller, averaging not more than 49 in snout-vent length (DUNN and SAXE, 5). On San Andrés a snout-vent length of 60-70 is common. The name *A. c. pinchoti* Cochran has been applied to the Providencia population, differing from *A. c. concolor* Cope only in smaller size. However, we have a male from Providencia which measured 70 in snout-vent length and adult males and females from San Andrés which measured as small as 39 and 43, indicating that size differences are not as previously reported and that subspecific recognition of the Providencia population is not warranted.

*Iguana iguana rhinolopha* Wiegmann. Providencia, 1. On Providencia these large lizards were most commonly seen in mangroves near the north shore. Residents of Providencia shun iguanas as a source of food, but many are captured and sent by boat to San Andrés, where they are sold and eaten. No iguanas were seen at San Andrés. DUNN and SAXE (5) had a single specimen from this island, but they are reported to be extremely scarce there.

The specimen, a young adult female, had a total length of 873 and a snout-vent length of 237.

*Ctenosaura similis similis* (Gray). Providencia, 2. No specimens were taken at San Andrés, although an adult was seen there in the higher leaves of a tall coconut palm. In Providencia they are commonly seen in the branches of large trees. These large lizards, called "ishillies" by the islanders, are generally elimi-

nated in inhabited areas due to extensive damage they cause to melon seedlings and chicks. On Providencia iguanas are also predators of young chickens, but they are less harmful than ctenosaurs in this respect.

DUNN and SAXE (5) did not recognize the San Andrés and Providencia populations to be distinct from those on the mainland, although BARBOUR and SHREVE (2) described the race *C. s. multipunctata* from Providencia on the basis of larger size. DUNN and SAXE examined specimens from Costa Rica and Panamá and found three ontogenetic changes (development of a mid-dorsal line of elongate scales, development of black bars on the belly and the change from a striped to a uniform throat color) to distinguish adult from young individuals, and in his revision of the genus, BAILEY (1) considered the minimum adult size on the mainland to be snout-vent length 250. One of our specimens, a male with a snout-vent length of 260, has the three adult characteristics well-developed and a testis length of 18.2. The other specimen, a female of 118 snout-vent length with immature ovaries, has only a small dorsal crest, spots in six transverse series across the abdomen and a striped throat.

Characters of these two specimens correlate well with growth stages on the mainland, and although DUNN and SAXE found eight specimens from San Andrés and five from Providencia to average larger than mainland adults, this difference does not sufficiently separate Central American and island forms to consider them separate races.

*Mabuya mabouya pergravis* Barbour. Providencia, 7. This skink is not present on San Andrés but was common in grass and brush at Providencia. They were frequently seen in litter on the floor of banana groves and were occasionally seen among branches of low woody plants. They are called "snake waiting boy" on Providencia. DUNN and SAXE (5) give an account of the variational range of many characters, and no major difference between our specimens and those previously collected is evident.

*Ameiva ameiva fuliginosa* (Cope). Providencia, 19. These "jacko lizards" are common and coexistent with *Cnemidophorus lemniscatus* and *Mabuya mabouya* on Providencia. They are not present on San Andrés.

DUNN and SAXE (5) had 18 specimens from Providencia and applied the subspecific name *fuliginosa* to this population. Characteristic of this race is a dark throat color and continuous dark mottling on the dorsum. Our 19 specimens varied considerably in respect to these characters. In 13 or 68% the throat was dark, the remainder light, and in only six or 32% was the dark mottling evident. According to DUNN and SAXE, the Providencia *Ameiva ameiva* show closer affinities to the extinct race *fuliginosa* from Swan Island than to *melanocephala* of Venezuela, *tobaganus* of Tobago or *atrigularis* of Trinidad.

*Cnemidophorus lemniscatus lemniscatus* (Linnaeus). Providencia, 29; San Andrés, 10. The most common lizard on both islands, males were more commonly seen than females. Although occasionally observed in piles of brush, none were

seen high in bushes as reported by DUNN and SAXE (5). On both islands they occupied all terrestrial habitats except swamps, and on San Andrés they were also seen in sandy, vegetated areas of beaches. The males are called "blue lizards" and the females "green lizards" by the islanders.

The population of San Andrés was introduced from Providencia 20-25 years ago, and if during this time selection had caused a shift in frequency of some characters, we could not detect it. Average difference in characters examined was slight and not significant.

*Leptotyphlops albifrons magnamaculata* Taylor. Providencia, 34. DUNN and SAXE (5) had a single specimen from San Andrés, and we found them to be common on Providencia. Locally they are called "silver snakes" and were taken beneath logs and stones. Two were taken from a dirt road during the day.

The specimens are similar in coloration and scale counts and differ little from the original description (TAYLOR, 13). In all a rostral spot is present, and the tip of the tail is clear cream. Characters given below of our specimen are followed in parentheses by those given by TAYLOR for the type or type series from Utila Island, Honduras: total length, 124-293 (167); tail length, 9-17 (10.4); length / tail, 13.7-16.7 (14); length/ diameter, 42.1-51.9 (45-58); longitudinal scale count, 220-245 (233-253).

*Constrictor constrictor imperator* (Daudin). Providencia, 1. DUNN and SAXE (5) had specimens from both San Andrés and Providencia, and this snake is said to be common on both islands. Our specimen, a female, was taken from a chicken house. It was heavily infested with ticks, and the stomach was empty. Another was seen in the top branches of a papaya tree but was not collected.

The characters of the specimen do not differ from those of mainland populations and are within the range of variation given by DUNN and SAXE for four specimens from the islands (given in parentheses below). The characters are as follows: dorsal scale rows, 74 (65-74); ventral scale rows, 250 (247-251); blotches on body, 25 (23-25); snout-vent length, 1070 (1080-1428).

*Coniophanes andresensis* Bailey. This was the only reptile taken by DUNN and SAXE (5) which we did not encounter. This snake is endemic to San Andrés, and DUNN and SAXE had 12 specimens for examination.

## DISCUSSION

The flora and fauna of San Andrés and Providencia thus far studied have been found with both Central American and Antillean elements. BOND (3) collected 49 species of birds on Providencia and 40 on San Andrés, including 15 endemic forms, and found the avifauna predominantly West Indian. Of the 15 resident land birds, at least 12 species were apparently derived from Jamaica and the Cayman Islands, and only one was undoubtedly of Central American origin. Among the mammals, deer, wild pigs, rats and house mice have found the environ-

ment suitable, and on the basis of the rather depauperate bat fauna, KOOPMAN (7) tentatively included San Andrés and Providencia in the West Indies, i. e., the Antillean subregion of HERSHKOVITZ (6). PROCTOR (10) found the lowland flora of Providencia to have West Indian affinities but those of the upland distinctly Central American. Introductions of plants by human agency have clearly been important.

The herpetofauna shows mainland rather than West Indian affinities. According to areas of most probable origin, DUNN and SAXE (5) consider three species derivable from Jamaica and the southern Lesser Antilles, two from Darién or the mainland of South America, and nine from Central America. *Leptodactylus insularum* is found on the Caribbean coast from British Guiana to the Canal Zone and probably came from that area. As it is not used for food, a recent introduction is unlikely. *Kinosternon scorpioides albogulare* occurs in the southwestern United States, Central America and northern South America; as San Andrés populations show no differentiation from those of the nearest known locality in Costa Rica, DUNN and SAXE consider the entry to have been relatively recent. *Geochelone carbonaria* occurs generally throughout South America, and from the north has been recorded from Colombia, Venezuela, British Guiana, Surinam and Brazil (WILLIAMS, 14). It is clearly an entrant from the southern periphery of the Caribbean area and is probably a human introduction. Specimens of *Aristelliger georgeensis* from San Andrés and Providencia, Swan Island, Cozumel Island, the Caymans, Jamaica and other Caribbean islands, cannot be distinguished from each other or from specimens from the coast of British Honduras. *Anolis c. concolor* shows the clearest case of direct derivation from the adjacent mainland, being indistinguishable from Nicaragua specimens. *Iguana i. rhinolopha* and *Ctenosaura s. similis* were undoubtedly introduced from the mainland as a source of food. *Ameiva a. fuliginosa* shows a closer resemblance to the now extinct race of the same name from Swan Island than to those of northern South America or the West Indies. *Cnemidophorus l. lemniscatus* is widely distributed in Central and South America but is probably derived from Nicaragua. *Leptotyphlops albifrons* occurs in lower Central America, and specimens from San Andrés and Providencia, although differing from mainland forms, are not different from specimens from Swan Island. *Constrictor c. imperator* shows no endemism and is derived from the mainland of Central America. *Coniophanes andresensis* is more similar to a Mexican form, *C. fissidens*, than to any other but is the only island form so different that it precludes post-Columbian introduction. *Sphaerodactylus argus andresensis*, although related to Central American forms, is derivable from Jamaica or Grand Cayman. *Mabuya mabouya pergravis* indicates strong affinities with *M. lanceolata* of Barbados and the southern Lesser Antilles.

The movements of people to and from the Caribbean islands and the mainland of Central America have apparently affected the fauna of San Andrés and Providencia, and this is clearly seen when these movements are chronologically examined (see PARSONS, 9). These islands were first colonized by the English in 1629, and from 1630 through 1640 many English came to Providencia from Barbados, Tortuga, St. Kitts and Tobago. During this time there was much

movement between San Andrés and Providencia for boat building and to the Mosquito coast of Nicaragua for exploration and trading with the indians. In 1640 the Spanish armada, based at Cartagena, Colombia, captured the islands, and for the next two hundred years population movements were mostly between Corn Island, the Caymans, Swan Island and the coastal islands and mainland of British Honduras. Regular trade with Jamaica began early, in 1655, and the log-wood and the turtle trade connected all these islands in an economic network which is reflected in the common speech and racial composition of the inhabitants. The low degree of endemism of the terrestrial fauna and flora that have been studied is sufficient to indicate that introductions by human agency since the arrival of the English have clearly been important in determining the composition of the biota of the two islands.

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### SUMMARY

The herpetofauna of the Caribbean Islands of San Andrés and Providencia consists of one frog, two turtles, eight lizards and three snakes. According to areas of most probable origin, three species are derivable from Jamaica and the southern Lesser Antilles, two from Darién or the mainland of South America, and nine from Central America. The herpetofauna clearly shows mainland rather than West Indian affinities, and introductions by human agency since the arrival of the first settlers in 1629 have been important.

### RESUMEN

La herpetofauna de las islas de San Andrés y Providencia en el Caribe consta de una rana, dos tortugas, ocho lagartijas y tres serpientes. De acuerdo con las áreas de origen más probable, tres de las especies se derivan de Jamaica y de las Antillas Menores del sur, dos del Darién o del continente suramericano, y nueve de la América Central. Dicha herpetofauna tiene claramente una mayor afinidad con la del continente que con la de las Indias Occidentales, y los agentes humanos de introducción desde la llegada de los primeros pobladores en 1629 han influenciado considerablemente la constitución de dicha fauna.



## LITERATURE CITED

1. BAILEY, J. W.  
1928. A revision of the lizards of the genus *Ctenosaura*. *Proc. U. S. Nat. Mus.*, 73: 1-55.
2. BARBOUR, T., and B. SHREVE.  
1934. A new race of rock Iguana. *Occ. Paps. Boston Soc. Nat. Hist.*, 8: 197-198.
3. BOND, J.  
1950. Birds of Cayo Largo (Cuba), San Andrés and Providencia. *Proc. Acad. Nat. Sci. Phila.*, 102: 43-68.
4. DUNN, E. R.  
1945. The amphibians and reptiles of the Colombian Caribbean islands of San Andrés and Providencia. *Caldasia*, 3: 363-365.
5. DUNN, E. R., and L. H. SAXE, JR.  
1950. Results of the Catherwood-Chaplin West Indies Expedition, 1948. Pt. V. Amphibians and reptiles of San Andrés and Providencia. *Proc. Acad. Nat. Sci. Phila.*, 52: 141-165.
6. HERSHKOVITZ, P.  
1958. A geographic classification of Neotropical mammals. *Fieldiana, Zool.*, 36: 583-620.
7. KOOPMAN, K. F.  
1959. The zoogeographical limits of the West Indies. *J. Mammal.*, 40: 236-240.
8. MINTON, S. A., and H. M. SMITH.  
1960. A new subspecies of *Coniophanes fissidens* and notes on Central American amphibians and reptiles. *Herpetologica*, 16: 103-111.
9. PARSONS, J. J.  
1956. San Andrés and Providencia: English-speaking islands in the western Caribbean. *Univ. Calif. Publ. Geogr.*, 12: 1-84.
10. PROCTOR, G. R.  
1950. Plants of Cayo Largo (Cuba), San Andrés and Providencia. *Proc. Acad. Nat. Sci. Phila.*, 102: 27-42.
11. Servicio de Meteorología de Colombia (República).  
1938. *Anuario Meteorológico*, 1934-1937.
12. Servicio de Meteorología de Colombia (República).  
1944. *Anuario Meteorológico*, 1938-1943.
13. TAYLOR, E. H.  
1940. Herpetological miscellany. *Univ. Kans. Sci. Bull.*, 26: 489-571.
14. WILLIAMS, E. E.  
1960. Two species of tortoises in northern South America. *Breviora*, 120: 1-12.