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NEW OR NOTEWORTHY SNAKES FROM PANAMA

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Snakes received from Panamá in 1940 and 1941 (mostly from Dr. H. C. Clark) contain two novelties and a number of rarities and unusual extensions of range. It seems desirable to put these on record in advance of publication of the population data on some 11,000 snakes which Dr. Clark has sent me from six areas in Panamá.

Upland Darien

Dunn and Bailey (1939, Bull. Mus. Comp. Zool., 86, 1, pp. 3-22) reported on all known snakes from the uplands of Darien, a total of 172 specimens, representing 40 species. Two lots in 1941 (83 additional snakes from Cana, 2000 feet, received from Dr. H. C. Clark, and six snakes from Cerro Sapo, 3000 feet, received from the Fifth George Vanderbilt Expedition, 1941) enable me to add four species to the snake fauna of these uplands. The area contains 44 species (known from 261 specimens), 8 of which are unknown from lowland Darien (43 species, 3081 specimens). Of these one is endemic, and four are South American forms which enter North America only in upland Darien. The fauna of lowland Darien contains no species in either of these categories.

Dendrohidion bivittatus (Duméril and Bibron)

A head and neck from Cerro Sapo. This is new to Panamá and to North America (it has been reported from Panamá before, but erroneously).

Rhinobothryum bovallii Andersson

A head and neck from Cana. Now known from Siquirres and Limon, Costa Rica, from lowland and upland Chagres, Panamá savannas, and upland and lowland Darien.

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Micrurus ancoralis jani Schmidt

A young female from Cana introduces this snake to the North American fauna. It was recently described from the Pacific coast of Colombia. The specimen has 286 ventrals; two-thirds of a triad on the nape; 15 complete triads on the body; one complete triad on the tail.

Trimeresurus schlegelii (Berthold)

One from Cerro Sapo.

Lower Chagres Basin (Madden and Gatun Lake areas)

I have examined 2746 snakes from this area, representing 61 species. This is the largest species list from any Panamanian area. Over 2230 of these snakes were received from Dr. Clark. The 1941 shipment contained only 161 specimens but added two species to the fauna.

The area fosters four species not known elsewhere; three species not otherwise known from lowland Panamá; one rather wide ranging form, which I am here reporting as new to Panamá, from two separated areas.

Sibynophis venustissimus (Günther)

A specimen from the village of Agua Clara, just outside the Canal Zone and about four miles from the right bank of the Chagres. The genus is known from Madagascar, from southeast Asia, and from America (Mexico to Colombia). The species is known to me from: three specimens from Nicaragua, including the type, and a fourth reported (four localities); five Costa Rican specimens and a sixth reported (six localities); five Panamanian specimens, reported in this paper (two localities). In 1932 Amaral reported two specimens from Muzo, Colombia.

This specimen is the second *Sibynophis* from the Canal Zone area. Time may tell whether *S. zetekii*, described from the Pacific side of the Canal Zone (one specimen out of 4253 snakes examined), is an independent species or a case of discontinuous variation.

Hydromorphus clarki new species

TYPE.—A.N.S.P. 23910.

Type locality.—Agua Clara Village, near Chagres River, Panamá.

Diagnosis.—A *Hydromorphus* with 17 scale rows anteriorly; one prefrontal; one internasal; one postocular (temporal entering orbit); lower 2½ scale rows white (ventral color).

Description.—Head and neck only; 17 scale rows; a single nasal; one prefrontal; one internasal; six upper labials, the third in orbit; eight right and nine left lower labials, four in contact with anterior chinshields, which are longer than the posterior; one preocular (loreal entering orbit below it);

one postocular, partly fused with parietal on left side (temporal entering orbit below it); temporals 1-2; dark olive brown above, white below, demarcation at middle of row 3; small tubercles on snout and chin indicate a male.

Remarks.—Peters described *Hydromorphus concolor* in 1853. I have examined his type, a female from "Costa Rica." The United States National Museum has a female from San José, Costa Rica, which is conspecific with the type. This they have recently loaned me. When I was in Boquete, Chiriquí, Panamá, in 1939, my friend Slevin, of the California Academy of Sciences, showed me a male of a new species of *Hydromorphus* which he had recently taken in the vicinity. He has very kindly sent me a photograph and some information. I am indebted to the curators of these three specimens. In these individuals there are two postoculars excluding the temporal from the eye; the dorsal pigmentation reaches the ends of the ventrals. The Boquete specimen has three prefrontals and only 15 rows of scales anteriorly.

Both San José and Boquete are at an altitude of 3800 feet; the Berlin type probably came from near San José; Agua Clara is less than 500 feet above sea level.

The hemipenis of *Hydromorphus* is identical with that of *Tretanorhinus*; the maxillary dentition is similar but with fewer (12-14) teeth; the head scales are reduced and more or less fused in *Hydromorphus*; the keel and the striations of the dorsal scales of *Tretanorhinus* are absent. No other ally can be mentioned, and it is almost certain that *Hydromorphus* is a depauperate *Tretanorhinus*. I previously thought *Hydromorphus* to be an upland derivative of the lowland *Tretanorhinus*, but the presence of both genera in the Canal Zone upsets that idea.

It is a pleasure to name this extraordinary find for Dr. H. C. Clark of the Gorgas Memorial Laboratory, from whom I have received more than 11,000 Panamanian snakes.

Upland Chiriquí

I have examined 370 snakes from this area, representing 32 species. Half of these occur in Panamá only in this area, two being endemic and 14 being known also from the uplands of Costa Rica. This is easily the most distinctive snake fauna in the Republic. Of these snakes 112 were sent in by Dr. Clark, mostly collected by the efforts of my friends the Monniches on their Finca Lérica above Boquete. It is desirable to put on record some of the recent finds.

Geophis godmani Boulenger

A single specimen without postocular sent in 1940 from Finca Lériida, Chiriquí. I know of four Costa Rican specimens: Irazu (B. M. N. H. 90-4-24, 10 Type), Escazu, Tierra Blanca, and one without definite locality received from the Museo Nacional and now in this Academy. The last has no postocular.

The *Geophis* of Panamá and Costa Rica may be distinguished as follows:

- A. Six upper labials, fifth in contact with parietals.
 - B. Supraocular present; posterior dorsals keeled; belly mostly dark; often with a light collar, or with light dorsolateral marking. *brachycephalus*.
 - BB. No supraocular; dorsals smooth; belly white; no light markings except on rostral and first upper labial.....*godmani*.
- AA. Five upper labials, last in contact with parietals; dorsals smooth; belly mostly dark; no light markings.....*hoffmanni*.

Of these species *hoffmanni* is the smallest and *godmani* the largest.

The material examined has been the following:

Geophis brachycephalus (Cope) 1871

Described from Costa Rica, this species has the following synonyms. I have examined all the types.

Cataglyphis dolichocephalus Cope 1871, San José, C. R.

Geophis monsta Günther 1872, Cartago, C. R.

Geophis chalybeus quadrangularis Günther 1893, Cartago, C. R.

Geophis championi Boulenger 1894, Chiriquí, Panamá.

I have taken it at La Loma, at Lériida, and at Boquete in Panamá, and examined 103 Panamanian specimens from these localities. I have seen 43 Costa Rican specimens from 13 localities, mostly in the mountains, although it occurs as low as Guapiles.

Geophis hoffmanni (Peters) 1859

Described from Costa Rica. I have examined the type (Berlin 4003), taken it at Suretka in the Talamanca Valley, and at Navarro, and have seen altogether 40 Costa Rican specimens from 11 localities. It is known from Boquete in Panamá (U. Michigan 57955-6) from two specimens taken by the Gaiges in 1923.

Rhadinaea pachyura decipiens (Günther)

A single specimen sent from Lériida in 1941. I have seen nine Costa Rican specimens, including the three cotypes in the British Museum, from

Irazu, one that I took at El Cedral de Navarro, one from San José, and two from La Palma. The white collar and the white stripe on the fifth scale row are very inconstant characters and this specimen lacks them. The white stripe on scale row one and the subpreocular scale are very constant characters and this specimen has them.

The intergradation of this form with *R. pachyura pachyura* (Cope), (of which I have examined the type from Sipurio in the Talamanca Valley of Costa Rica, one from Guapiles in eastern Costa Rica, and one from La Loma in Bocas del Toro, Panamá) is obvious as all three of the latter have a faint trace of a light stripe on the first scale row. In *pachyura* the light color of the top of the head reaches the end of the parietals, whereas in *R. d. fulviceps* (Cope) from the Canal Zone and Darien (I have examined the type and some 20 additional specimens) the light color of the head extends back over three or four nape scales, and there is no trace of a light stripe.

It is possible that this series of three forms may intergrade with *R. lateristriga* (Berthold) of Colombia and Ecuador, as the scalation is very similar, and the light stripes are in the position of those of *R. p. decipiens*.

Lowland Chiriqui

I have examined some 625 snakes from this area, representing 36 species, of which 602 (30 species) were sent in by Dr. Clark in 1940. These were gathered by local workmen through the cooperation of Mr. Thomas Yates, then of Farm Two of the Chiriqui Land Co., near Puerto Armuelles.

The fauna as a whole agrees with other lowland Pacific side Panamanian areas. One form seems to be endemic, three otherwise northern forms are present, and one form is otherwise known in North America only by a single specimen from Upland Darien. Climatically the area differs from the other Pacific lowland areas in that it receives sufficient summer rainfall to support forest growth and is botanically and climatically tropical deciduous forest (Amw) rather than tropical savanna (Aw). The incidence of fer-de-lance (27.3%) is extraordinarily high, but may be accounted for by a history of cane and banana cultivation.

Nothopsis rugosus Cope

Two specimens, from Farm Two, add to the seven previously known. Both have 28 scale rows and 10 upper labials. The seven specimens in this country have recently been counted for dorsal scale rows by Mr. Shreve of the Museum of Comparative Zoology (who has my thanks) and by myself. The dorsals are: 30 in one from Nicaragua; 30 in the Panamanian type and

in another from Panamá; 28 in three Panamanian specimens; 26 in a Costa Rican specimen. The two British Museum specimens (one from Costa Rica and one from Ecuador), while said to have an odd number of scale rows, have counts below 30 and over 26.

The vertebrae have the neural spines expanded, flattened, and divided by a longitudinal groove. The paravertebral scale rows fit, each upon one of these bony bases, so that even scale rows must be the rule. Similar snake vertebrae have been described in the otherwise very dissimilar South American snake *Xenopholis*.

The skull of a specimen from Farm Two shows only faint traces of "independent supraocular bones," partial sutures only existing between them and the frontals. Dr. Malcolm Smith has suggested an alliance of *Nothopsis* with the Oriental genera *Fimbrios*, *Achalinus*, *Stoliczkaia*, and *Xenodermus*. This is perhaps correct, but the group cannot be defined, and merges into normal snakes. *Nothopsis*, itself, is very different from any other American snake.

Sibynophis venustissimus (Günther)

Four from Farm Two. I have mentioned above the pertinent facts regarding this form.

Rhadinaea decorata (Günther)

In 1939, when Dunn and Bailey reported on snakes of eastern upland Panamá, the variant of this form with continuous light lines from eye along body (*ignita* Copel) was recognized as a Darien race, based on four specimens, although complete intergradation was known from the Canal Zone (a strong majority there being of the typical form, with two breaks in the light line). Nine specimens from Farm Two include no typical *decorata*, one with one break on one side only, one with one break on each side, seven "*ignita*" with no breaks at all. The status of *ignita* as a race with definite distribution is therefore very questionable, and probably the form should be dropped. It is still worth noting that this variant is known only from Panamá.

Rhadinaea persimilis Dunn

A single Farm Two specimen is the fifth known specimen, the second from Panamá, and the first from Chiriquí. It has a subpreocular on each side, seven right upper labials (3-4 in eye), and eight left upper labials (4-5 in eye).

D'psas anthracops (Cope)

A head from Farm Two has the following characters: wide dark and light bands; 13 dorsals, the vertebral not enlarged; normal genials; eight upper labials, fourth and fifth in orbit; an upper and a lower preocular do not exclude loreal from orbit; three postoculars; temporals 2-3 on right, 3-3 on left. This specimen is referred to *anthracops* (of which I have examined the type from "Central America," two from Nicaragua, and three from Pacific side Costa Rica, including the type of *Sibynomorphus ruthveni* Barbour and Dunn) for the time being. It differs from the others in having preoculars, in having three instead of two postoculars, in having eight upper labials, in having 2-3 anterior temporals instead of one. It (and the others) differs from the type of *ruthveni* in having 13 instead of 15 dorsals.

Two other similar forms are known from the Panamá-Nicaragua area, with normal genials and wide dark and light bands. These are Atlantic side and have 15 dorsals (vertebral enlarged); 9-10 upper labials; and much longer tails (more subcaudals) than *anthracops*. They are: *viguieri*, of which I have examined the type and eight others from the Canal Zone and eastern Panamá; *articulata*, of which I have examined the type and three other specimens from western Panamá and Costa Rica. These differ only in ventral and caudal counts.

The head from Farm Two is anatomically and geographically nearer to *anthracops* than to *viguieri-articulata*.

Erythrolamprus mimus impar Schmidt

Twelve specimens from Farm Two.

A male, A.N.S.P. 22565, has 181 ventrals, 18 black body rings, and the light head band is immaculate. The high count of body rings, and the immaculate head band place this population with *impar* (of Nicaragua and Honduras) rather than with *micrurus* (of the Canal Zone and Darien). No *impar* are known from Costa Rica, in which country *E. bizona* is the only known form, and *E. bizona* is a widespread and abundant Panamanian form. Both *bizona* and *mimus micrurus* occur together in Panamá and in Colombia. I have seen 10 Nicaraguan *impar* from 7 localities; 58 Costa Rican *bizona* from 13 localities; 12 Panamanian *impar* from Farm Two; 18 Panamanian *micrurus* from 9 localities; 242 Panamanian *bizona* from 23 localities. *E. bizona* and *E. mimus micrurus* seem quite distinct species.

Trypanurgos compressus (Daudin)

Three from Farm Two. Previously known from North America only from a single specimen from Cana, Darien, 2000 feet elevation.

Micrurus clarki Schmidt

Three from Farm Two help to close the gap between the single Costa Rican specimen and the other Panamanian ones (one from the Pacific side of the Zone, six from the Atlantic side of the Zone, 16 from lowland Darien and one from upland Darien).

Micrurus nigrocinctus yatesi new subspecies

TYPE.—A.N.S.P. 22564, collected by Mr. Thomas Yates and his men. Sent in by Dr. Clark in 1940.

Type locality.—Farm Two, Chiriqui Land Company, near Puerto Armuelles, Chiriqui, Panamá.

Range.—Known only from type locality.

Diagnosis.—A race of *M. nigrocinctus* in which, with age, the red rings turn black dorsally; adult a coral snake ringed black and yellow above; black, yellow and red below; black nape ring involves 5-7 throat ventrals.

Description.—Since none of the specimens are complete it is impossible to add much to the diagnosis.

Three small specimens (indistinguishable from *M. nigrocinctus nigrocinctus* and one considered as such by K. P. Schmidt) and five larger ones (all showing the blackened red rings) were in the shipment. The throat ventrals involved by the nape ring were five in three specimens (including the type and two small ones) six in two specimens (both large), and seven in the biggest. One small and one large one were presented to Field Museum before this count was made. The precise color of the type is: a black snout which involves upper labials 1-4; mental and lower labials 1-3; postoculars, frontal, supraoculars, anterior edge of parietals (as in *nigrocinctus nigrocinctus*); a light ring involving parietals, temporals, posterior labials and one nape scale; a black ring 6-7 scales long above; a two scale yellow ring; a 6-7 black ring (red below); a two scale yellow ring; a four scale black ring (black below); etc.

Remarks.—I have seen some 15 *M. nigrocinctus* from upland Chiriqui. One of these from Boquete (Mich. 57949) is very dark above and may show some transition to the present form.

I have seen three *M. nigrocinctus* from Boruca and Buenos Ayres, Costa Rica, in the low Golfo Dulce area adjacent to Chiriqui. They appear typical *M. n. nigrocinctus* to me despite the fact that one of them, A.M.N.H. 17365, served as a paratype of the Atlantic Coastal form *M. n. mosquitensis*.

Thus the range of this form would seem to be surrounded by that of the typical race.

A similar darkening of the red rings above is seen in *M. ephippifer*, known from three females from Oaxaca in Mexico.