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THREE NEW SPECIES OF ANOLIS FROM THE
SANTA MARTA MOUNTAINS, COLOMBIA.

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The collections of reptiles and amphibians from the Santa Marta Mountains which the writer has had for study, one from the Museum of Comparative Zoology, one made by the Bryant Walker Expedition of the University of Michigan (1913), and one made for the University of Michigan in 1914 by M. A. Carriker, contain specimens of three undescribed species of Anoles which are described below. The identification of species in this genus becomes more difficult as the number of known forms increases, so that in order to make sure of the identity of these forms the writer has again had to solicit the aid of Dr. George A. Boulenger, of the British Museum. Dr. Boulenger has kindly examined specimens of the species described below as *Anolis solitarius* and *Anolis gaigei*, and he has expressed the opinion that they belong to undescribed species.

Anolis solitarius, new species.

Diagnosis: Tail subcylindrical. Dorsal scales very small, juxtaposed, smooth, a little larger than the granular laterals. Digital lamellae well developed. Occipital scale enlarged, much larger than ear. Scales of supraorbital semicircles enlarged, in contact in interocular region. Snout a little flattened and produced. Tibia as long or nearly as long as the distance between the end of the snout and the middle of the orbit. Ventrals rather small, rounded, smooth, imbricate.

Habitat: Santa Marta Mountains, Colombia.

Type Specimen: Cat. No. 48303, Museum of Zoology, University of Michigan; San Lorenzo, elevation of 5,000 feet, Santa Marta Mountains, Colombia; June 9, 1913; F. M. Gaige, collector.

Description of Type Specimen: Female. Head long and narrow, the length to the posterior margin of the ear 1.86 times the width, the width slightly less than the length of the tibia, equal to the length of the snout, the length of the tibia a little less than the distance between end of snout and middle of orbit; frontal ridges feebly developed; upper head scales smooth; supraorbital semicircles enlarged, separated by two rows of scales, except at one point where they are in contact; about six enlarged and slightly rugose supraoculars; occipital scale enlarged, 2.5 times the greatest diameter of ear; 7 and 8 upper labials to below the middle of orbit; 4 rows of loreal scales. Ear opening small. Gular appendage indicated. Tail subcylindrical, constituting about 65% of the total length. Dorsal scales very small, juxtaposed, smooth, a little larger than the granular laterals; ventral scales rather small, rounded, smooth, imbricate. The hind limb reaches to the front of the shoulder when the limb is extended along the side; sixteen lamellae under the second and third phalanges of the fourth toe. Sides of body

benzo brown with a few lighter and darker spots, the former white, the latter bone brown; the vertebral region occupied by an army brown stripe interrupted by five hour-glass-shaped bone brown spots; head bone brown except for some greenish white markings on the upper lip; tail alternately banded with bone black and army brown; ventral surfaces white, the sides of the belly encroached upon by the color of the sides, the submental region faintly spotted with darker, the skin of the region of the gular pouch black.

	mm.		mm.
Total length	139	Width of head	7.5
Length of tail	91	Length of hind limb	28
Length of head and body	48	Length of tibia	8.5
Length of head to posterior border of ear ..	14	Length of fore limb	17

Notes on Paratypes: Two paratypes, both females, agree with the type in structural characters, except that the head is a little smaller, the length of the tibia is as long as the head to the middle of the orbit, and the supraorbital semicircles are broadly in contact. One of these specimens has the same total length as the type, 139 mm., but the head measures 13 mm.; the other is smaller, the total length being 124 mm., of which the head occupies 12 mm. The smaller of the specimens was uniform green when captured but this quickly changed to that of the type. In the other the head is natal brown with some poorly defined white spots below the orbit, the sides are wood brown without spots, and there are two bone brown dorsal stripes on either side of a vertebral stripe, Rood's brown in color, which extends from the occiput well toward the end of the tail.

Remarks: Five specimens of this species from the Santa Marta Mountains have been examined. Three taken at alti-

tudes of 4,500 and 5,000 feet on San Lorenzo by the Bryant-Walker Expedition are in the University of Michigan collection, one from Pueblo Viejo, altitude 8,000 feet, collected by M. A. Carriker on March 21, 1914, has been deposited in the British Museum (Natural History), and there is a specimen collected at Palomina, by W. W. Brown, between June 3 and 10, 1898, in the Museum of Comparative Zoology. The specimen from Palomina has considerable white on the side of the head and there is a dark brown vertebral stripe from which narrow bars descend on the flanks; the supraorbital semicircles are in contact.

***Anolis solifer*, new species.**

Diagnosis: Apparently allied to *A. copei* Bocourt. Tail slightly compressed, with slightly prominent upper edge. Dorsal scales a little smaller than those on the flanks. Digital expansions well developed. Occipital scale very small, one half the longest diameter of the ear opening. Scales of supraorbital semicircles enlarged, separated by two rows of scales. Tibia as long as the head to the posterior border of the orbit. Ventral scales distinctly keeled.

Habitat: Santa Marta Mountains, Colombia.

Type Specimen: Cat. No. 6549, Museum of Comparative Zoology; La Concepcion, Santa Marta Mountains, Colombia; March 28, 1899; W. W. Brown, collector.

Description of Type Specimen: Male. The width of the head slightly less than the length of the tibia, about two-thirds of the length of the head (to the posterior border of ear); frontal concavity present, no frontal ridges; scales involved in frontal concavity smooth, those on either side of the concavity obtusely keeled or with a median tubercle, those anterior to the

concavity keeled; scales of supraorbital semicircles enlarged, separated by two series of scales; enlarged supraoculars numerous, smooth or with a central swelling; occipital small, one-half the longest diameter of the ear; canthal scales five; ten upper labials to below the center of the eye; six rows of scales in the loreal region; ear opening moderate, a vertical oval. Gular appendage small. Body somewhat compressed; tail slightly compressed, with slightly prominent upper edge, its length more than twice the length of head and body. Dorsal scales granular, obtusely keeled; ventrals large, rounded, distinctly keeled; no enlarged postanal scales. The adpressed hind limb reaches the front of the shoulder; digital expansions well developed, twenty-one lamellae under the second and third phalanges of the fourth toe.

The preserved specimen is dark reddish brown above with faintly indicated darker cross bars on the body, limbs and tail. The abdomen is white, except that the sides are encroached upon laterally by the brown of the upper parts. The under surface of the limbs and the submental, gular and pectoral regions are pale brown, the gular and submental regions are streaked with dark brown, and all of the scales on the free edge of the gular pouch are dark brown. The skin of the gular pouch is purplish black.

	mm.		mm.
Total length	216	Width of head	11
Length of tail	152	Length of hind limb	39
Length of head and body	64	Length of tibia	12
Length of head to posterior margin of ear ..	18	Length of fore limb	21

Remarks: As has been stated, this form is, in the opinion of the writer, allied to *A. copei*. It differs from that form in having smoother head scales and shorter hind limbs.

Anolis gaigei, new species.

Diagnosis: Tail subcylindrical. Dorsal scales small, keeled, the largest a little smaller than the ventrals, slightly imbricate or juxtaposed, grading into the minute and tubercular laterals. Digital expansions moderately developed, the third phalange of the fourth toe not distinctly wider than basal. Occipital scale enlarged, as large as, a little larger, or, rarely, a little smaller than the ear. Scales of the supraorbital semicircles enlarged, usually separated by two, occasionally by three, scales. Length of tibia usually equal to the length of the head to the ear, rarely a little shorter or longer. Ventrals small, round, imbricate, strongly keeled, occasionally a little mucronate. Female without rudiment of gular pouch.

Habitat: Santa Marta Mountains, Colombia.

Type Specimen: Cat. No. 48304, Museum of Zoology, University of Michigan; San Lorenzo, Santa Marta Mountains, Colombia, elevation of 2,700 ft.; July 14, 1913; F. M. Gaige, collector.

Description of Type Specimen: Adult male. Width of head three-fifths of its length to posterior margin of ear, 1.36 times the length of the snout; length of head equal to the length of the tibia; a frontal concavity bounded by low frontal ridges; upper head scales distinctly keeled; scales of supraorbital semicircles enlarged, separated by three rows of small scales; about 12 enlarged, keeled supraoculars; occipital scale enlarged, a little larger than ear opening, separated from the supraorbital semicircles by about three rows of small scales; canthus rostralis distinct; 7 upper labials to below middle of the orbit; 7 rows of loreal scales. Ear opening moderate, a vertical oval. Gular appendage moderately developed. Tail subcylindrical, its length contained in the total length 1.43 times. Dorsal scales small,

keeled, slightly imbricate, smaller than the ventrals, gradually passing into the minute and tubercular laterals; ventrals small, rounded, keeled, imbricate; no enlarged postanal scales. The adpressed hind limb reaches the front of the orbit; digital expansions moderately developed, the third phalange of the fourth toe not distinctly broader than the basal, 15 lamellae under phalanges II and III of the fourth toe. Vertebral region and upper part of head dark brown without distinct markings; sides pale olive buff; upper aspect of limbs pale brown with indistinct darker cross bands. Lower surfaces white, the abdomen without markings, the limbs with faint dark reticulations, the submental region and throat finely speckled with pale brown. Gular pouch Mars orange.

	mm.		mm.
Total length	153	Width of head	7.5
Length of tail	107	Length of hind limb ...	39
Length of head and body	46	Length of tibia	12.5
Length of head to pos- terior margin of ear..	12.5	Length of fore limb	20

Notes on Paratypes: There are eleven specimens from the same general locality as the type and these have been used in preparing the diagnosis. The structural characters are quite constant within narrow limits, and the variations are quite adequately summarized in the diagnosis. The following differences in color may be noted. In both males and females the pale color of the sides may extend forward to the front of the orbit or to the end of the snout. There are only two males besides the type in this series, one of which is colored like the type, while the other has a broad vertebral band of pale olive buff margined by narrow irregular dark brown stripes. Three females are also colored like the type, but in four others which

have a similar coloration the dark median band is much paler and thus less in contrast to the color of the flanks and is interrupted by more or less distinct small brown spots or chevrons, while two females have a broad orange yellow vertebral band limited on each side by a well defined, straight edged, dark brown band. The skin of the gular region in the females is generally a delicate pink in life.

Remarks: Thirty-three specimens of this species have been examined as follows: thirteen secured by the Bryant Walker Expedition (1913) at Fundacion and from above Mamatoco at the base of the mountains near Santa Marta to an elevation of about 2,700 feet, two collected at Pueblo Viejo (8,000 ft.) by M. A. Carriker, March 20, 1914, and eighteen taken at Pueblo Viejo by W. W. Brown during the last two weeks in March and the first week in April, 1898. The Pueblo Viejo specimens collected by Brown are in the Museum of Comparative Zoology with the exception of one specimen which has been retained for the University of Michigan collection, through the kindness of Dr. Thomas Barbour. Of the series obtained by the Bryant Walker Expedition one specimen has been presented to the British Museum and twelve are in the University of Michigan, as are the two specimens taken at Pueblo Viejo by Carriker.

The Pueblo Viejo collections contain a number of males and show that individuals of this sex usually have the pale dorsal band possessed by one of the paratypes, and that the females probably rarely have the broad immaculate orange yellow stripe, since only two specimens in the entire series have this type of coloration.



Ruthven, Alexander Grant. 1916. "Three new species of Anolis from the Santa Marta Mountains, Colombia." *Occasional papers of the Museum of Zoology, University of Michigan* 32, 1–8.

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