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A THIRD LEAF-NOSED SPECIES OF THE LIZARD GENUS *ANOLIS* FROM SOUTH AMERICA

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It gives us considerable pleasure to be able to announce the discovery of another specimen of the leaf-nosed anoles. It is the first time that leaf-noses have been known to occur outside of the Amazon Basin. The locality from whence it came is on the Pacific side of the Andes in the hot and humid "Choco" portion of northwestern Ecuador. While the new individual is obviously closely related to the holotype of the species described by Myers and Carvalho (1945), the differences are sufficiently great that we feel justified in calling it a new species.

Since the original specimen was collected, the Escuela Polytechnica has sent several other collectors into the area and the senior author made several trips to the type locality during the summer of 1954 when he obtained comparative material of other species of the genus *Anolis*,¹ but no one has yet been able to obtain additional representatives. Nothing is known as yet as to the habits of these unusual animals or the use to which the rostral appendage is put.

¹ Field work in Ecuador during 1954 by the senior author was supported by a grant from the Penrose Fund of the American Philosophical Society.

ANOLIS PROBOSCIS, new species

Type. Museum of Comparative Zoology No. 54300, a mature male from the neighborhood of Cunuco, a small town at 1200 meters elevation, five kilometers northwest of Mindo, on the south bank of the Río Mindo, a northern tributary of the upper Río Blanco, in Pichincha Province, Ecuador, collected by Antonio Proaño, during April 27-29, 1953.

Diagnosis. This new species is distinguished from all other species but one in the genus *Anolis* by the presence of an elongated, fleshy appendage, which is about as long as the head, on the snout. The only other species with a similar appendage is *Anolis phyllorhinus* Myers and Carvalho, from which it differs in having a serrated edge on the rostral appendage, 10-11 upper labials to a point below the center of the eye, 9-10 lower labials, and a median dorsal row of scales which is produced into a serrated dorsal crest, as well as other characters mentioned below.

Description. Snout with an elongate, fleshy appendage projecting anteriorly, with a distinct downward curve; length of appendage approximately equal to length of head, measured from tip of rostral to ear opening. Appendage arises approximately half way between eye and nostril, on midline; strongly serrate along upper margin to level of rostral, serration less marked but still serrate to tip, both above and below; nine scales wide at level of rostral, tapering to three at tip; rather fleshy and rounded at snout, tapering to thin and vertically compressed at tip. Scales on dorsum of head smooth, pavementose, irregular. No distinct depression in frontal region, frontal ridges almost obsolete, faintly indicated from middle of supraorbital semicircles to frontal area, where they end at level of anterior margin of eye. Canthus rostralis not strongly angulate but rather rounded, with 5-6 canthal scales from nostril to eye; area between canthi occupied by irregular, smooth scales, 8-9 in a straight line between canthi at level of origin of nasal appendage and approximately the same number between the posterior ends of the canthi, due to gradual increase in size of scales in frontal area. Scales of supraorbital semicircles large, somewhat scarified, slightly angulate; not in contact on midline, separated by two rows of smaller, pavementose scales. Supraorbital scales in contact with semicircles, no granular scales separating them;

three or four scales in center of supraorbital area are markedly larger than others, but no rows or series are formed. Interparietal large, considerably larger than ear opening; separated from supraorbital semicircles by two rows of scales.

Rostral completely horizontal below appendage, extending well beyond lip line. Nostril sunk in a single scale. Two scales between canthus rostralis and upper labials anteriorly, four or five posteriorly, no distinguishable horizontal rows of loreal scales. Last scale in canthus rostralis followed by a single superciliary, which is in turn followed by the granular area of eyelid. Granules of eyelid continuous with smaller scales of supraocular region; these two areas are not separated by a series of superciliaries. Single row of three or four enlarged subocular scales from loreals to granular postocular region and between the granules of eye and the upper labials; terminal scale of this row enters the labial row on both sides, and on one side extends to the lip line. Temporal region with many small, pavementose scales, not arranged in rows or series. Ear opening quite small. Eleven upper labials on left side, ten on right to below center of eye, one additional labial behind eleventh on left, one right subocular enters labial row, followed by granular scales. First labial on both sides wedged between rostral and second labial, lower edge only partially on lip line.

Mental almost completely divided on midline, suture incomplete anteriorly only. Nine lower labials on left, ten on right. Seven sublabials on each side, anteriormost in contact with lower labials, posterior four or five separated from labials by smaller scales; sublabials reduced in size posteriorly, gradually merge with other chin scales, which are small, numerous, and pavementose or occasionally granular.

Body very slightly compressed, vertebral angle comparatively sharp. Dorsal crest of raised denticulations runs down spine from head onto tail, with 85 spines from back of head to level of posterior insertion of hind limbs. In several instances adjacent denticulations are fused, with sutures still visible. Scales on dorsum of body pavementose, quite small, smooth, no enlarged paravertebral rows. Lateral scales approximately equal in size and appearance to dorsals. Granular scales, i.e., scales with raised centers rather than a flat surface, are present on neck, shoulders,

and above hind legs. Ventral scales considerably larger than dorsals and laterals, smooth, for most part in imbricate rows. Scales on throat quite granular except on moderately developed gular fold, where the scales are larger and quite imbricate. Imbricate scales of belly pass into pavementose or even granular scales at level of pelvis, and remain so to anus. No enlarged preanal scales; no femoral or preanal pores.

Scales on all parts of limbs and feet subequal, pavementose or slightly granular. Scales on dorsum of digits expanded, much wider than long, extend across dorsal surface of digit; smaller scales on lateral edges of digits, which are dorso-laterally flattened; expanded scales on ventrum of digits pavementose at base of toe, lamellar on proximal part of toe. Lamellar counts are shown in Table 1.

Tail very strongly compressed, vertebral angle sharp, with a prominent dorsal crest. Scales at base of tail smooth, pavementose, and irregularly arranged; gradually become larger, squarish, and arranged into vertical series, but still pavementose at level of posterior end of hemipenial sheath. Two large, smooth scales form base of postanal hemipenial pockets. At this point the scale rows begin to become more prominent and imbricate, forming whorls; lowermost rows of scales begin to have keels at about $\frac{1}{5}$ of length of tail, keels invade lateral rows until at $\frac{1}{2}$ length of tail all rows are keeled; keels increase in prominence until at end of tail there are four pronounced edges formed by keels on four rows of scales.

TABLE 1

	Fore Foot	Hind Foot
Left	5-11-16-17-10	4-11-19-29-18
Right	5-11-17-17-10	4-12-14-30-18

Scale formulae for digits in holotype. All enlarged scales on the venter of each digit were counted, beginning with the first distinctly enlarged, pavementose scale at the base of the toe and continuing to the tip of the expanded lamellar portion. Scales on the most distal, curved phalanx, which arises dorsally from the lamellar portion of the toe, are not included.

Dorsal ground color (in alcohol) a dull gun-metal blue, with

irregular, parallel, horizontal black streaks along vertebral margin. These streaks vaguely line up and form a pair of lateral bands between the limbs. Dark brownish-black spot at shoulder. Limbs and lateral surfaces spotted with light yellowish-white; limbs vaguely barred with darker blue; skin in interstices between scales of dorsum of digits light, giving appearance of banding on fingers and toes. Dorsum of head unicolor, as back; temporal region and lips lighter, with faint reddish or purplish tinge and a marked light spot over the ear opening. Ventral surfaces generally lighter, with vague reddish tints on chest and chin; belly stippled with light spots. Venter of limbs heavily spotted with white proximally, becoming totally white on foot. Tail alternately barred with gun-metal blue and blackish, bands approximately equal in width.

Measurements (in millimeters). Total length (not including rostral appendage), 171; body length (rostral to vent), 74; tail length, 97; head length (rostral to ear opening), 23; head width at widest point, 11; length of rostral appendage, 23; length of fore limb, 31; length of hind limb, 42.

Remarks. Since only a single male of *A. proboscis* is known, the possibility exists that the specimen belongs to a previously described Ecuadorian form, known either solely from females or from juvenile males, both of which might lack the rostral appendage. Since the species occurs in a very distinctive biotic region, the Choco of Ecuador, Colombia, and Panamá, it is also possible that it might be the first Ecuadorian representative of a Choco species. There are seventeen species which have been described from type localities within the biotic area. Of the sixteen that are currently considered valid species, eight (*chloris* Blgr., *eulaemus* Blgr., *festae* Peracca, *gracilipes* Blgr., *granuliceps* Blgr., *latifrons* Berthold, *maculiventris* Blgr., and *peraccae* Blgr.) have been previously recorded from Ecuadorian localities. While in the Choco area of Ecuador in 1954, the senior author collected four specimens of *A. breviceps* Blgr., three individuals of *A. peraccae* Blgr., and one of *A. festae* Peracca, at Hacienda Equinox, which is 30 kilometers northwest of Santo Domingo de los Colorados. *A. breviceps* had not been known from Ecuador. Seven additional species have been recorded in the literature as taken from Ecuadorian localities within the Choco area, although

their type localities are elsewhere. Two other taxons, *aequatorialis* Werner and *irregularis* Werner, must also be considered, since they were described from Ecuador with no added information, and no additional specimens have been taken to establish a range for the species.

There are sixteen species, including *albi* Barbour, *bitectus* Cope, *breviceps* Blgr., *fasciatus* Blgr. (with its synonyms *elegans* Blgr. and *irregularis* Werner), *festae* Peracca, *fraseri* Günther (with its synonym *devillei* Blgr.), *gracilipes* Blgr., *granuliceps* Blgr., *latifrons* Berthold (with its synonym *princeps* Blgr.), *lemniscatus* Blgr., *lemurinus* Cope, *macrolepis* Blgr., *maculiventris* Blgr., *notopholis* Blgr., *palmeri* Blgr., and *peraccae* Blgr., for which both males and females are known, and for which available specimens or descriptions provide many and obvious differences from *A. proboscis*. Females only are known of the species *antonii* Blgr. and *ventrimaculatus* Blgr., but the descriptions given for the types shows that these species are quite different from *A. proboscis*. Only males of *aequatorialis* Werner, *chloris* Blgr., *eulaemus* Blgr., *rosenbergi* Blgr., and *tropidogaster* Cope have been described in the literature, but here again each appears to be quite distinct. The sex was not given in the original descriptions of *binotatus* Peters, *gemmosus* O'Shaughnessy, and *lionotus* Cope, but they are sufficiently well described to eliminate them as available names for *A. proboscis*.

Myers and Carvalho (1945, p. 7) felt that the relationships of their new species were with the *punctatus* group of the genus *Anolis*, and this is undoubtedly true also of *proboscis*. They discussed *A. punctatus*, *A. boulengeri*, *A. transfasciatus* and *A. nasofrontalis* as probable members of the species group. They had no specimens of *A. boulengeri* available, and the specimens called *A. punctatus* were only tentatively identified as such. They had, however, excellent material of *A. transfasciatus* Amaral, a species they considered sufficiently similar to *A. punctatus* to suggest that the former might well be placed eventually as a subspecies or synonym of the latter.

A single specimen of *A. boulengeri* O'Shaughnessy, collected in Santiago-Zamora Province, Ecuador, in the region between the Río Pastaza and the Río Santiago, is catalogued as No. 45776, in the Museum of Comparative Zoology. It provides an

opportunity to compare data for this species with the notes made on other species by Myers and Carvalho. The specimen has, on its snout, a substantial protuberance which does not extend to any distance beyond the end of the jaw. This swelling is without doubt the primitive condition that led eventually to the elongation observed in *phyllorhinus* and *proboscis*. It is slightly more prominent than that of *A. transfasciatus* and presumably also of *punctatus*. In addition to the presence of keels on the ventrals, *A. boulengeri* differs from both leaf-nosed species and *transfasciatus* in the presence of keels on the enlarged supraocular scales. The suboculars and the lowest row of loreals form a straight series in both *boulengeri* and *phyllorhinus*, while in *transfasciatus* and *proboscis* the subocular series turns upward around the eye, not forming a linear series with the loreal row. There is no middorsal scale row in *boulengeri*. Two rows of scales, slightly larger than the other dorsals, occupy the vertebral line. There is no midventral row of scales. All dorsal, lateral, and ventral scales have keels which can be seen if examined under sufficiently high magnification. This is not true of *proboscis* or *phyllorhinus*, and apparently not true of *transfasciatus*. It appears, then, that *A. boulengeri* is quite distinct from all these species, and presumably, from *A. punctatus* as well. Verification of the latter assumption must await direct comparison of the two species.

Cope (1876, p. 165) described *Scytomycterus laevis*, from the Huallaga River, in eastern Peru, which had the rostral plate produced into a flexible appendage. Both *Anolis phyllorhinus* and *Anolis proboscis* are quite distinct from this species, for they have the snout projection composed of several rows of small scales, while *A. laevis* has an appendage composed of a single scale, the rostral. Boulenger (1885, p. 11) synonymized *Scytomycterus* Cope with the genus *Anolis*, where it has remained since.

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