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TWO NEW SQUIRRELS FROM ECUADOR

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IN a recent collection of mammals from Ecuador, sent to the University of Michigan Museum of Zoology by the junior author, there are two races of squirrels which are herewith described as new.

We wish to thank the authorities of the American Museum of Natural History for the loan of comparative material.

Sciurus gerrardi imbaburae, n. subsp.

TYPE.—Adult female, skin and skull, U.M.M.Z. No. 77020; from Peñaherrera (Intag) western subtropical part of Imbabura Province, Ecuador; altitude, approximately 1500 meters. Collected May 2, 1934, by Philip Hershkovitz, original No. M212. Besides the type there are six paratypes.

DIAGNOSIS.—Differs from *Sciurus gerrardi inconstans* Osgood (1921), by obsolescence of the black dorsal band and by the softer and thicker pelage. The average length of the tail is shorter than in any other race of *gerrardi*.

COLOR OF THE TYPE.—Upper parts including head, sides, outside of hind legs, and feet grizzled Ochraceous-Tawny¹ and black. Median dorsal region from nape to rump with relatively more black than sides, but not forming a distinct band.

¹ Capitalized color terms are from Ridgway (1912).

Hairs of back slate black at base followed by a narrow sub-terminal band of Ochraceous-Tawny and tipped with black. Shoulders and outside of forearms Xanthine Orange with dark basal portions of hairs showing through. Nose and cheeks buffy; chin Warm Buff. Ears Argus Brown; post-auricular patches Pale Orange-Yellow. Eye ring Ochraceous-Buff. Basal one-fourth of tail above and below like back; middle portion Xanthine Orange with black bases of hairs showing through. Ventral surface of tail grizzled with black and Ochraceous-Buff, broadly fringed with Xanthine Orange. Terminal three inches of tail entirely black. There is a considerable variation in the banding of the hairs in the mid-portion of the tail, but in general the hairs are wholly black or banded alternately with four orange and three black bands beginning with orange at the base; the terminal orange tip is about twice the length of the other bands except on the under surface where it is much narrower. Underparts and inner surface of forearms and legs bright orange. Hairs of the underparts grayish at the base and tipped with bright orange. Throat Capucine Orange.

VARIATION.—The type series is fairly uniform in coloration. There is some variation in the intensity of the orange on the ventral surface and tail, and in the amount of black over the dorsal region.

MEASUREMENTS (in mm.).—The first is of the type, followed by the means and extremes of the type series, including the type. Head and body, 238, 229.2 (223–238); tail, 185, 169.8 (146–185); hind foot (s. u.), 53, 51.8 (49–55); ear from notch, 29, 26.8 (26–29). Skull: Greatest length, 53.7, 53.84 (51.1–56); condylo-premaxillary length, 48.5, 48.41 (46.5–49.8), 6 specimens; greatest zygomatic width, 31.2, 32.4 (31.1–34.1), 6 specimens; greatest length of nasals, 15.4, 15.78 (14.8–17.3), 5 specimens; width of nasals, 7.9, 8.0 (7.5–8.5); least inter-orbital width, 16.2, 16.88 (15.9–18.4); postorbital constriction, 19, 19.24 (18.5–19.8); width of brain case, 23.4, 24.2 (23.2–24.9); palatal bridge, 17.2, 17.14 (16.1–17.9); diastema, 12.6, 12.64 (12–13.3); alveolar length of upper molar row, 9.5, 9.15 (9.4–10).

RELATIONSHIPS.—It is evident by comparing *Sciurus gerrardi imbaburae* with two specimens of *S. g. inconstans* from Esmeraldas (possibly topotypes) and thirteen specimens from Paramba and nearby localities in the upper Río Mira Valley that *imbaburae* is most nearly related to *inconstans*. Of the specimens from the Río Mira Valley the darker individuals are identical with those from Esmeraldas, and the paler ones are intermediate in character between typical *inconstans* and *imbaburae*.

REMARKS.—This form is the most southerly of the *gerrardi* group; its near relationship to *inconstans* of the coastal region points to the probability of its having become separated from the latter form by migrating east to the Andes through the Guallabamba Pass and into the Llurimagua Valley, where it established itself. Although *Sciurus hoffmanni* has been recorded from the same general region (Intag) by Thomas (1880:400) as *S. aestuans* it is, as yet, not evident that the two forms may be found living together. The species *gerrardi* was the only squirrel of this genus encountered by the collector; the natives know of but one kind of squirrel at the type locality of *imbaburae*. Trouessart (1910:18) recorded a specimen from Canchacoto between Quito and Santo Domingo, two from Gualea, and another from Santo Domingo, all of which he identified as *versicolor* Thomas (= *inconstans* Osgood). Since the above localities are all near the type locality (to the south) and are on the western side of the Andes, they should be considered, for the time being, as *imbaburae*.

SPECIMENS EXAMINED.—Seventeen. Paramba and other nearby localities in the Río Mira Valley, Imbabura Province, Ecuador, 13 (U.M.M.Z.), Esmeraldas, possibly topotypes, *S. g. inconstans*, 2 (A.M.N.H.); Cocal, Colombia, topotype, *S. g. leonis* Lawrence (1933:369), 1 (A.M.N.H.); Baudo, Colombia, topotype, *S. g. baudensis* (Allen), 1 (A.M.N.H.).

Sciurus candelensis carchensis, n. subsp.

TYPE.—Adult male, skin and skull, U.M.M.Z. No. 77041; from Atal, about five miles southeast of San Gabriel, Montú-

far, Carchi Province, Ecuador, in the cold temperate rain forests of the western slope of the eastern cordillera of the Andes. Altitude, about 2900 meters. Collected September 22, 1934, by Philip Hershkovitz, original No. M274. Besides the type there are four paratypes and one specimen from five miles north of the type locality.

DIAGNOSIS.—*S. c. carchensis* is distinguished from typical *candeleensis* by its much longer pelage, lighter coloration throughout, and its nearly uniform coloration of the dorsal surface not contrasting conspicuously with the color of the sides. The tail is paler and somewhat narrower.

COLOR OF THE TYPE.—Upper parts, including the head, sides, and upper surface of legs and feet, grizzled Ochraceous-Buff and black. Hairs of back Slate-Gray at base, narrowly banded near the proximal end with Ochraceous-Buff and tipped with black. Black tips of hairs longer on mid-portion of back than in the region of the neck and shoulders. Sides, feet, and legs somewhat lighter than back, where the subterminal bands of hairs are wider. Sides of face and chin buffy. Small grayish postauricular patch present. Ears Mummy Brown. Ochraceous-Orange eye ring present. Basal one-fourth of tail above and below like back. Rest of tail, except tip, Ochraceous-Orange on upper surface, changing caudally to Ochraceous-Buff with the wide subterminal band of black of the hairs conspicuously showing through. Tip of tail black, but with hairs narrowly tipped with buffy. The hairs of the tail show considerable variation, but in general they are a mixture of long black hairs tipped with ochraceous and of hairs banded alternately with four ochraceous and four black bands, beginning with black at the base. The subterminal black band is more than twice the width of the other bands. Under surface of tail like upper surface, but bordered with black and fringed with ochraceous. Underparts including throat and inner surface of legs whitish with neutral gray of the base of the hairs showing through. There is a buffy wash over the mid-ventral portion of the body. A narrow line of Ochraceous-Orange on the lower edge of the sides marks off the sides from the belly.

VARIAION.—The five specimens of *S. c. carchensis* agree closely with the type with but one exception. The ventral surface of No. 77042, a young female, is colored with an admixture of orange and whitish hairs, the orange predominating, instead of being almost uniformly whitish with faint washes of buffy on the belly, as in all the other specimens. Its tail is also redder, thereby resembling the tail of typical *candeleensis*.

MEASUREMENTS (in mm.).—The first measurement given is that of the type; this is followed by the means and extremes of the type series. Head and body, 207, 201.6 (191–212); tail, 177, 170.8 (154–186); hind foot (s. u.), 49, 48.1 (47–49); ear from notch, 26, 26.5 (26–28). Skull: greatest length, 50.6, 49.72 (47.7–50.6), 4 specimens; condylo-incisive length, 46.4, 45.26 (42.2–45.8), 5 specimens; greatest zygomatic width, 31.2, 30.43 (29.6–31.2), 3 specimens; greatest length of nasals, 15.5, 14.62 (13.8–15.5) 4 specimens; width of nasals, 7.6, 7.02 (6.4–7.6), 5 specimens; least interorbital width, 15.7, 15.80 (15.5–16.7), 4 specimens; postorbital constriction, 18.1, 17.85 (17.2–18.1), 4 specimens; width of brain case, 23, 22.87 (22.1–23.3), 4 specimens; palatal bridge, 15.2, 14.94 (14.4–15.7), 5 specimens; diastema, 12.0, 11.62 (10.8–12.0), 5 specimens; alveolar length of molar row, 8.7, 8.96 (8.7–9.1), 5 specimens.

REMARKS.—Comparison with topotypes of *candeleensis* was believed sufficient to justify separating *carchensis* as a geographic race. The only other described race of this species is *sumaco* (Cabrera), but the two known specimens of this race are not available. However, the type locality of *sumaco* is to the east of the Andes in the tropical zone at a lower altitude than that of *carchensis*. The difference of altitude and habitat, in addition to the fact that, according to Cabrera's description, *sumaco* has darker colored upper parts and a smaller hind foot, seems ample justification for regarding *sumaco* and *carchensis* as distinct geographic races.

Specimens examined.—Twelve. *S. c. carchensis*: Atal, Carchi Province, Ecuador, 5 (U.M.M.Z.); Causmal, Mata Redonda, Carchi, Ecuador, 1 (U.M.M.Z.). *S. c. candeleensis*: La Candela, Columbia, 4; La Palma, Columbia, 2 (A.M.N.H.).

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