

OCCASIONAL PAPERS OF THE MUSEUM OF
ZOOLOGY

UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN

UNIVERSITY OF MICHIGAN PRESS

TWO NEW RODENTS OF THE GENERA *GLAUCOMYS*
AND *ZAPUS* FROM UTAH

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DURING the summer of 1931, Dr. Alden H. Miller visited several parts of the western United States to study juncos; Mrs. Miller accompanied him and sought out and saved 71 mammals, as study specimens for the Museum of Vertebrate Zoology. Two of these from the mountains of northern Utah, a flying squirrel and a jumping mouse, could not be identified as belonging to previously named races. Knowing of specimens of *Glaucomys* and *Zapus* taken in the Uinta Mountains by Doctors A. and R. D. Svihla, inquiry was made of Dr. Lee R. Dice as to the availability of this material, study of which it was thought would give a better understanding of the relationships of these animals. Dr. Dice generously permitted the use of the specimens. Comparison of them with pertinent specimens in the Museum of Vertebrate Zoology shows that each of the two genera mentioned is represented in northern Utah by a heretofore unrecognized geographic race.

***Glaucomys sabrinus lucifugus*, new subspecies**

TYPE.—Female, adult, skin, and skull; No. 47613, Mus. Vert. Zool.; 12 miles east of Kamas, Summit County, Utah;

July 13, 1931; collected by Virginia D. Miller; original No. 101.

RANGE.—Known only from the Uinta Mountains of Utah.

DIAGNOSIS.—Size: medium (see measurements). Color: pale; underparts whitish; face gray. Skull: postorbital and interorbital regions and rostrum narrow.

COMPARISONS AND REMARKS.—Among described subspecies of *Glaucomys sabrinus*, *lucifugus* appears to be structurally most similar to *Glaucomys sabrinus bangsi*, the adjoining race to the northward. Of *bangsi* we have, in addition to adult male and young specimens, three adult females for comparison with the three adults of the same sex representing the newly named race. Employing these three adults of *bangsi*, from Anthony, Oregon, Alturas Lake, Idaho, and Camp Tendoy, near Pocatello, Idaho, and the published figures and measurements, it is found that *lucifugus* is everywhere paler, less reddish and more grayish, especially on the face. Above, the pelage is basally Dark Neutral Gray¹ rather than Dusky Neutral Gray, and apically is Avellaneous with less reddish than in *bangsi*. The feet are Drab rather than Pale Hair Brown; the underparts are whitish and lack the Light Pinkish Cinnamon; and the underside of the tail is lighter than in *bangsi* though between Tilleul Buff and Vinaceous Buff. The relative narrowness in *lucifugus* of the postorbital and interorbital regions extends also to the rostrum, the width of which, measured at the anterior margins of the anterior palatine foramina, amounts to less than 53 per cent of the length of the nasals rather than more than 53 per cent as in *bangsi*.

Glaucomys sabrinus bullatus Howell is described as a much larger animal than *bangsi* and on this basis alone might be distinguished from *lucifugus*. Doubt, however, as to the distinctness of *bangsi* and *bullatus* has elsewhere been expressed.²

¹ Capitalized color terms are from R. Ridgway, *Color Standards and Color Nomenclature*. Washington: published by the author, 1912. Pp. 44, 53 color plates.

² Wayne B. Whitlow and E. Raymond Hall, "Mammals of the Pocatello Region of Southeastern Idaho," *Univ. Calif. Publ. Zool.*, 40, 1933: 254.

When Arthur H. Howell reported upon the American flying squirrels he had no specimens from Utah, though he did report their occurrence near the head of Smith's Fork in the Uinta Mountains and in Emery County.³ V. M. Tanner records flying squirrels, probably of the subspecies *lucifugus*, from three localities in the Wasatch Mountains.⁴ Ruth D. Svihla has described the taking of the two specimens here listed as examined from Beaver Creek, and mentions the taking of still another at the neighboring locality of Granite Park.⁵

MEASUREMENTS.—Three adult females, the type, and Nos. 60318 and 60319 from Beaver Creek, measure, in millimeters, respectively, as follows: total length, 325, 324, 324; length of tail, 154, 157, 151; length of hind foot, 38, 38, 37.5; greatest length of skull, 40.8, 41.0, 41.0; zygomatic breadth, 24.5, 24.7, 25.3; mastoidal breadth, 19.2, 19.2, 19.3; interorbital breadth, 7.8, 8.5, 8.1; postorbital breadth, 9.2, 9.2, 9.2; length of nasals, 12.3, 12.8, 13.0; alveolar length of maxillary tooth-row, 8.0, 8.5, 8.4; breadth of rostrum at anterior margins of anterior palatine foramina, 6.4, 6.4, 6.6.

SPECIMENS EXAMINED.—Total number, 3, from Utah: Summit County; 12 miles east of Kamas, 1 (type, Mus. Vert. Zool.). Daggett County; Beaver Creek, 2 (Mus. Zool., Univ. Mich.).

Zapus princeps utahensis, new subspecies

TYPE.—Female, adult, skin and skull; No. 59153, Museum of Zoology, University of Michigan; Beaver Creek, 19 miles south of Manila, Daggett County, Utah; July 16, 1928; collected by A. and R. D. Svihla; original No. 176.

³ "Revision of the American Flying Squirrels," *North Am. Fauna*, No. 44, 1931: 31, footnote.

⁴ "Some of the Smaller Mammals of Mount Timpanagos, Utah," *Journ. Mammalogy*, 8, 1927: 251.

⁵ "Mammals of the Uinta Mountain Region," *Journ. Mammalogy*, 12, 1931: 261, 264; "The Ecological Distribution of the Mammals on the North Slope of the Uinta Mountains," *Ecol. Monographs*, 2, 1932: 71.

RANGE.—Known only from the Uinta and Wasatch Mountains of Utah.

DIAGNOSIS.—Coloration pale; lateral line faintly indicated or wanting; size large; tail long; skull large, relatively broad; palate short and wide; upper tooth-rows diverging anteriorly.

COMPARISONS AND REMARKS.—*Z. p. utahensis* appears to be most closely related, among named forms, to *Zapus princeps cinereus* Hall, known from the Raft River Mountains of northwestern Utah. Selected differences for *utahensis* are as follows: size larger; tail relatively as well as actually longer; lateral line better developed; skull longer but palate and upper tooth-rows shorter; zygomatic breadth relatively greater; tooth-rows more divergent anteriorly and palate correspondingly wider anteriorly. The latter difference is reflected in the circumstance that the width of the palate taken between the third upper molars amounts to 74 (68–78) per cent of the width of the palate measured between the fourth upper premolars, whereas the corresponding per cent is 80 in each of the two adults of *cinereus*.

Compared with a series of eight topotypes of *Zapus princeps princeps* Allen, *utahensis* lacks the conspicuous lateral stripe of Ochraceous Buff and has the buff color everywhere reduced in amount; has a relatively as well as actually longer tail; and has a skull which is larger in every part measured excepting the length of the palate, and the breadth of the palate at M³. In *utahensis* the skull is relatively wider across the zygomata; the upper tooth-rows are more divergent anteriorly; and the posterior border of the palate lies in front of the posterior margins of the last upper molars rather than on a line with, or posterior to, these teeth.

Other specimens of *Z. p. princeps* are available, through the courtesy of Mr. E. R. Warren, from more northern localities in Colorado, as follows: Jackson County: Mount Zirkel, on Ute Pass Trail, 9500 feet, 2; Brand's Ranch, Lake John, 8250 feet, 1. Routt County: Steamboat Springs, 6750 feet, 1. Rio Blanco County: Big Beaver Creek, 6800 feet, 1; Meeker, Harker's Ranch, 6200 feet, 1. Gunnison County: Decker's Ranch, Crested Butte, 1. These specimens agree in coloration

with topotypes of *princeps*, and on the basis of this feature alone are easily distinguished from the gray-sided forms to the westward in Utah and Nevada. The specimens from northern Colorado agree with topotypes of *princeps* in general size of external parts and skull and in relative proportions of skull. The one noteworthy difference which we find is that, except in the specimen from Big Beaver Creek, the posterior margin of the hard palate lies anterior to the posterior margins of the last upper molars. In this respect these animals differ from topotypes of *princeps* and agree with specimens of *utahensis*, those of *cinereus*, and ones from farther north in Idaho.

Specimens from west-central Idaho, recently have been found by Mr. W. B. Davis to belong to an unrecognized subspecies.⁶ Comparison with materials used by him shows that *utahensis* differs as follows: coloration darker, that is to say less yellowish and more blackish on back and sides, with lateral line less well defined and dorsal area more sharply set off from sides; ventral face of tail yellowish rather than whitish; skull averaging larger in every part measured, zygomatic breadth greater, averaging 52.4 per cent rather than 50.6 per cent of occipitonasal length; palate wider anteriorly and upper tooth-rows more divergent anteriorly.

An adult male, No. 47646, Mus. Vert. Zool., from 12 miles southwest of Woodruff, Rich County, agrees with topotypes of *utahensis* except for the longer and relatively narrower palate, which is characteristic of the adjoining race *cinereus*.

Specimens from Daggett County mentioned in the present account have been commented upon as to habitat by Svihla.⁷ The localities of capture of other specimens from Utah, possibly of the race *utahensis*, have been recorded from time to time in the *Journal of Mammalogy*.⁸

⁶ "A Study of the Idaho Jumping Mice of the Genus *Zapus*, with Remarks on a Few Specimens from British Columbia," *Journ. Mammalogy*, 15, No. 3, 1934: 221.

⁷ *Op. cit.*

⁸ See L. R. Wolfe, "Utah Records for *Zapus princeps princeps*," *Journ. Mammalogy*, 9: 154; A. W. Moore, "*Zapus princeps princeps* in Utah," *ibid.*, 9: 154; J. S. Stanford, "Notes on Mammals of Utah," *ibid.*, 12: 362.

MEASUREMENTS.—Average and extreme measurements, in millimeters, of 9 adults from Daggett County, Utah, are as follows: total length 239 (220–252); length of tail, 148 (132–159); length of hind foot, 31.7 (29.2–33.6); occipitonasal length, 25.2 (24.6–25.8); zygomatic breadth, 13.2 (12.9–13.8); least interorbital breadth, 4.9 (4.5–5.0); mastoid breadth, 11.4 (11.1–11.7); crown length of upper tooth-row, 4.3 (4.2–4.4); length of palate, 3.4 (3.2–3.6); breadth of palate at M³, 3.1 (2.8–3.3); breadth of palate at Pm⁴, 4.2 (4.0–4.5). Corresponding measurements of breadth of palate for 5 topotypes of *princeps* are 3.2 (3.1–3.2) and 4.0 (3.8–4.1); for type and one topotype of *cinereus*, 3.2, 3.2, and 4.0, 4.0; and for 10 adults of the west-central Idaho race, 3.0 (2.8–3.1) and 3.8 (3.6–4.0). From the measurements it may be seen that there is a greater difference between the width of the palate anteriorly and posteriorly in *utahensis* than in the other three races mentioned.

SPECIMENS EXAMINED.—Total number, 13, from Utah, as follows: Daggett County: Elk Park, 20 miles south of Manila, 2; Beaver Creek, 19 miles south of Manila, 5; Carter Creek, 4; Granite Park, 24 miles south of Manila, 1. Rich County: 12 miles southwest of Woodruff, 1 (Mus. Vert. Zool.). All except the specimen last listed are in the collection of the Division of Mammals, Museum of Zoology, University of Michigan.

