

PROCEEDINGS
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DESCRIPTIONS OF A NEW GENUS AND SEVEN NEW
RACES OF FLYING SQUIRRELS.

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A study of the American flying squirrels has led to the discovery of a number of unrecognized forms, preliminary descriptions of which are presented herewith. The subgenus *Glaucomys* Thomas,* is believed to be of generic rank and the name is therefore used for all the American species. The large Himalayan species, *Sciuropterus fimbriatus* Gray, referred by Thomas to *Glaucomys*, is here made the type of a new genus. *Sciuropterus* F. Cuvier, 1825, as has been shown by Miller,† is a synonym of *Pteromys* G. Cuvier, 1800‡; the latter name, in my opinion, should be restricted to the small Palaearctic species—*volans*,§ *büchneri*, and related forms.

Eoglaucomys genus nov.

Type, Sciuroptera fimbriata Gray (= *Sciuropterus fimbriatus* auct.).

Characters.—Skull essentially similar in general features to that of *Glaucomys*; postorbital processes longer and more strongly decurved; interparietal with antero-posterior diameter much greater than in *Glaucomys*—about two-thirds of the transverse diameter; molariform teeth much as in *Glaucomys*, with comparatively simple structure, *but with crown of pm³ divided into two cusps by a distinct sulcus* (partially worn teeth

* Ann. & Mag. Nat. Hist., (ser. 8) I, 1908, p. 5 (type *Mus volans* Linn.).

† Proc. Biol. Soc. Wash., XXVII, 1914, p. 216.

‡ *Pteromys* G. Cuvier, Leçons Anat. Comp., I, 1800—Type, *Sciurus volans* Linn. = *Pteromys russicus* auct.

§ Linnaeus (Syst. Nat. ed. 10, 1758) named the European flying squirrel *Sciurus volans* and the American species *Mus volans*; the names are not homonyms, therefore, and in recognizing the two animals as generically distinct, it will be necessary to use the name *Pteromys volans* (= *P. russicus* of Tiedemann and later authors) for the Russian animal, retaining *Glaucomys volans* for the small species of eastern North America.

showing two closed triangles). *Soles partially naked, bearing five pads*—four at the bases of the toes, and a *large metatarsal pad*, elliptical in shape, situated about midway between the heel and the base of the toes;* tail slightly flattened, full and bushy, narrowing decidedly towards the tip; ears large, subtriangular in shape, more acutely pointed than in either *Glaucomys* or *Pteromys*.

Remarks.—The genus, so far as known, is monotypic. In external appearance it bears no close resemblance either to the American *Glaucomys* or to the small Palaearctic flying squirrels of the genus *Pteromys*, being readily distinguished from either by the characters of the soles, as well as by large size and bushy, tapering tail. In cranial characters, the resemblance to *Glaucomys* is certainly striking, as Mr. Thomas has pointed out,† but in assigning the animal to the latter group, he evidently overlooked the important structural differences in the anterior premolar and in the plantar tubercles.

***Glaucomys volans saturatus* subsp. nov.**

Type from Dothan, Alabama; adult female, No. 178,366, U. S. Nat. Mus. (Biological Survey collection); collected March 13, 1912, by A. H. Howell; original number 1960.

Characters.—Similar in size and skull characters to *volans*, but upperparts darker at all seasons; toes not conspicuously whitened in winter. Compared with *querceti*: Upperparts darker, face grayer (less buffy), hind feet grayer (less brownish), and audital bullae smaller.

Measurements.—Average of 12 adults from southern Alabama: Total length, 226; tail vertebrae, 100; hind foot, 30. Skull (of type): Greatest length, 34.9; zygomatic breadth, 20.4; mastoidal breadth, 17.4; interorbital breadth, 7.2; length of nasals, 9.5; alveolar length of maxillary tooth row, 6.5.

Remarks.—This dark race of *volans* occupies the Gulf States, excepting Florida and Texas (and perhaps Louisiana), extending north to eastern Tennessee and western North Carolina and west to Arkansas and Oklahoma. It differs in color from all the surrounding races and from *querceti* and *texensis* also in skull characters.

***Glaucomys volans texensis* subsp. nov.**

Type from 7 miles northeast of Sour Lake, Texas. Adult male, No. 136,400, U. S. Nat. Mus. (Biological Survey collection); collected March 15, 1905, by J. H. Gaut; original number 3480.

Characters.—Similar in size and color to *volans*; upperparts slightly more ochraceous and toes without conspicuous white markings in winter; skull decidedly shorter and relatively broader. Compared with *saturatus*: Colors much paler; skull shorter and broader. Compared with *querceti*: similar in color, but skull shorter, with smaller audital bullae.

* A small, circular, supplementary tubercle appears in some specimens on the outer side of the sole, directly posterior to the pad at the base of the fifth digit.

† Ann. & Mag. Nat. Hist. (Ser. 8), I, 1908, p. 6.

Measurements.—Average of six adults from type locality: Total length, 229; tail vertebrae, 104; hind foot, 30.8. *Skull* (of type): Greatest length, 34; zygomatic breadth, 20.9; mastoidal breadth, 17.2; interorbital breadth, 7.3; length of nasals, 9.2; alveolar length of maxillary tooth-row, 6.3.

Remarks.—This subspecies bears a close resemblance to both *volans* and *querceti* in color but differs from them in characters of the skull. It is known from only a few localities, but apparently occupies the humid portion of eastern Texas and portions of Louisiana.

***Glaucomys sabrinus canescens* subsp. nov.**

Type from Portage la Prairie, Manitoba. Subadult female, No. 7663, Field Mus. of Nat. Hist.; collected February 3, 1900, by G. F. Dipple.

Characters.—Similar to *G. s. macrotis*, but much paler, with grayer head and larger skull. Compared with *sabrinus*: Size smaller; upperparts and feet paler; underparts whiter.

Measurements.—Average of two specimens from type locality: Total length, 298; tail vertebrae, 140; hind foot, 38. *Skull* (of type): Greatest length, 38.8; zygomatic breadth, 22.9; mastoidal breadth, 17.6; interorbital breadth, 7.6; length of nasals, 11.2; alveolar length of maxillary tooth-row, 7.6.

Remarks.—This is the palest of the races of *sabrinus* and is apparently intermediate in size between *sabrinus* and *macrotis*. By reason of the small number of specimens available, its range can not be defined with exactness, but probably it occupies the thinly timbered portions of southern Manitoba and eastern North Dakota and may range even farther westward.

***Glaucomys sabrinus columbiensis* subsp. nov.**

Type from Okanagan, British Columbia. Subadult male, No. 94,310, U. S. Nat. Mus. (Biological Survey collection); collected May 9, 1898, by Allan Brooks; original number 1214.

Characters.—Similar to *G. s. klamathensis*, but upperparts more vinaceous and tail much darker; much paler than *oregonensis*, both above and below; very similar to *sabrinus*, both in color and cranial characters, but soles of hind feet often yellow (as in *klamathensis*); skull similar to that of *oregonensis*; smaller than that of *klamathensis*, with smaller bullae.

Measurements.—Two specimens (subadult) from Okanagan Lake, B. C., each measured: Total length, 313; tail vertebrae, 143; hind foot, 42. *Skull*: Average of 4 (adult and subadult) from same locality: Greatest length, 41; zygomatic breadth, 24.4; mastoidal breadth, 19.1; interorbital breadth, 7.3; length of nasals, 12.7; alveolar length of maxillary tooth-row, 7.8.

Remarks.—This subspecies is most closely related to *oregonensis* of the coast region of Oregon and Washington, intermediates between the two forms occurring at Sumas and Chilliwack, B. C. Intergradation with *fuliginosus*—the form occupying the Cascades—is shown by specimens from mouth of Salmon River, B. C. The present form occupies the low country in the interior of British Columbia and northern Washington.

***Glaucomys sabrinus latipes* subsp. nov.**

Type from Glacier, British Columbia. Adult female, No. 68,753, U. S. Nat. Mus. (Biological Survey collection); collected August 13, 1894, by J. Alden Loring; original number 2111.

Characters.—Similar to *G. s. fuliginosus*, but larger, and upperparts averaging darker and grayer; feet larger and darker colored. Compared with *alpinus*: Size larger; colors darker (more brownish, less drab); underparts darker.

Measurements.—Adult female (type): Total length, 359; tail vertebrae, 161; hind foot, 43; average of 9 adults from Coolin, Idaho, and Stanton Lake, Mont.: 339, 151; 40.6. *Skull* (of type): Greatest length, 44.2; zygomatic breadth, 25.1; mastoidal breadth, 20; interorbital breadth, 8.3; length of nasals, 14; alveolar length of maxillary toothrow, 8.8.

Remarks.—This subspecies is one of the largest of the American flying squirrels, equaling *yukonensis* in external measurements and exceeding it in size of skull. Although evidently closely related to *fuliginosus*, of the Cascades, there is at present no evidence of intergradation with that race. The present form differs widely from *alpinus*, which occupies the eastern slopes of the Rockies in Alberta, and from the much smaller *bangsi* of the Bitterroot and Sawtooth Ranges of Idaho and Montana.

***Glaucomys sabrinus flaviventris* subsp. nov.**

Type from head of Bear Creek, Trinity County, California (altitude 6400 feet). Adult male, No. 13,319, Univ. of Calif., Mus. Vert. Zool.; collected August 13, 1911, by Annie M. Alexander; original number 1775.

Characters.—Similar in size and skull characters to *G. s. lascivus*, but underparts and feet strongly suffused with yellow or buff; similar to *klamathensis*, but smaller, with much smaller audital bullae; underparts more yellowish and tail darker beneath. Compared with *stephensi*: Upperparts much paler and underparts more yellowish; skull flatter with shallower braincase.

Measurements.—Average of five adults from type locality: Total length, 301; tail vertebrae, 133; hind foot, 40.4; ear, 20.7. *Skull* (of type): Greatest length, 40; zygomatic breadth, 23.4; mastoidal breadth, 17.9; interorbital breadth, 7.9; length of nasals, 12.3; alveolar length of maxillary toothrow, 8.1.

Remarks.—This race is apparently most nearly related to *lascivus* of the Sierra Nevada, from which it differs widely in the color of the under-

parts. It intergrades with *lascivus* in the region around Mt. Lassen, with *klamathensis* in the Warner Mountains, and with *fuliginosus* in the Siskiyou Mountains.

***Glaucomys bullatus* sp. nov.**

Type from Sawtooth (Alturas) Lake, Idaho. Adult female, No. $\frac{24271}{31675}$, U. S. Nat. Mus. (Biological Survey collection); collected September 28, 1890, by Vernon Bailey and B. H. Dutcher; original number 1883.

Characters.—Size large (about equaling *G. sabrinus latipes*; much larger than *G. s. bangsi*); color of upperparts similar to that of *bangsi* but decidedly more ochraceous (less vinaceous); gray on face purer and more extensive; skull large, with narrow, deep braincase, the frontoparietal region markedly elevated; molars heavy; audital bullae very large.

Measurements.—Adult female (type): Total length, 340; tail vertebrae, 150; hind foot, 46; average of 6 adults from Ketchum, Idaho: 336; 142; 42.5. *Skull* (of type): Greatest length, 44; zygomatic breadth, 25; mastoidal breadth, 19; interorbital breadth, 8.7; length of nasals, 13.9; alveolar length of maxillary toothrow, 9.2.

Remarks.—This species resembles certain of the forms of *sabrinus* rather closely in color but is readily separated from all of them by its peculiar skull with very large bullae. Its range, as now known, is from Ketchum, Idaho, north to Cranbrook, British Columbia. At Sawtooth Lake it occurs on the same ground with the much smaller *G. s. bangsi* and at Cranbrook, B. C., occurs with *G. s. columbiensis*.

