

NOTES ON SOME SQUIRRELS OF THE SCIURUS
HIPPIURUS GROUP, WITH DESCRIPTIONS
OF TWO NEW SPECIES

BY MARCUS WARD LYON, JR.

ASSISTANT CURATOR, DIVISION OF MAMMALS, U. S. NATIONAL MUSEUM

Squirrels of the *Sciurus hippurus* group are represented in the collections of the U. S. National Museum by sixteen specimens, over half of them collected by Dr. W. L. Abbott in his explorations of Malaya, among them two forms not previously described. Squirrels of this group have been recorded from the Malay Peninsula, Sumatra, Java, Borneo, and the Natuna Islands.¹ They have not been taken by Dr. Abbott or by other collectors, so far as I am aware, on the numerous smaller islands of the Malay Archipelago. Whether this is due to an actual absence of the group from those islands, or to rarity, or to some peculiarity of habit, it is impossible to say.

Four forms of this group are here recognized, two of which occur on the Island of Borneo. They may be known by the following key and descriptions :

- A.*—Middle line of back very different in color from rest of upperparts.
S. grayi (Borneo)
- A'*.—Middle line of back not different in color from rest of upperparts.
B.—Size smaller, outer side of forearm concolor with upperparts.
S. hippurcellus (Borneo)
- B'*.—Size slightly larger, outer side of forearm concolor with sides of neck.
C.—Rostrum narrow, dorsal portion of premaxillæ very narrow ;
underparts lighter. *S. hippurosus* (Sumatra)
- C'*.—Rostrum not so narrow, dorsal portion of premaxillæ broad ;
underparts darker. . . . *S. hippurus* (Malay Peninsula, Java)

¹ Anderson, Zool. Results, Western Yunnan, 1879, p. 241 (Malay Peninsula, Sumatra, Java).

Bonhote, Fasc. Malay. Zool. I, 1903, p. 19 (Malay Peninsula).

Geoffroy, Mag. de Zool., Cl. I, No. 6, pl. 6, 1832 (Java).

Gray, Ann. Mag. Nat. Hist., 3d ser., xx, 1867, p. 283 (Malacca, Borneo).

Hose, Mammals of Borneo, 1893, p. 45 (Borneo).

Jentink, Notes Leyden Mus., v, 1883, p. 118 (Malay Peninsula, Sumatra, Borneo).

Schlegel and Müller, Verhandl. Nat. Gesch. Nederl. Overz. Bezitt., p. 86 (Sumatra, Assam, Canton, China).

Willink, Natuurkundig Tijdschrift Nederlandsch-Indië, Lxv, 1905, p. 239 (Sumatra, Java, Borneo, Natunas).

SCIURUS HIPPURUS Is. Geoffroy

1832. *Sciurus hippurus* IS. GEOFFROY, Mag. de Zool., Cl. I, No. 6, pl. 6 (Java).

1842. *Sciurus rufogaster* GRAY, Ann. Mag. Nat. Hist., x, 1842, p. 263 (Malacca).

Cotypes.—In the Paris Museum of Natural History, two mounted specimens from Java, collected by Diard in 1826 and 1832.

Mr. Gerrit S. Miller, Jr., in some notes on types in the Paris Museum in 1904, remarks that three mounted specimens are marked "type." The third specimen came from Malacca, and was taken by M. Edoux in 1838 (Voyage de la *Bonite*). As this specimen was collected six years after the original description was published, it has evidently been erroneously marked "type." No reference is made to specimens elsewhere than from Java in the original description.

Color (based on specimens from the Malay Peninsula).—Back and sides of body, top of neck from behind ears, and upper surface of base of tail, a grizzle of black and raw sienna, the latter color rather in excess and sometimes inclining to tawny on the lower back and base of tail. Top and sides of head and neck, region in front of shoulder, outer surface of forearm, sides of rump, and outer surface of thighs and legs, blackish slate, finely grizzled with white. Feet blackish slate, very slightly specked with a dull whitish color. Underparts and inner sides of fore and hind limbs hazel, slightly brighter than that of Ridgway.² Tail generally a dull black, sometimes inclining to brownish black, coarsely grizzled at the base above with the raw sienna of the upper parts, and at the base below slightly grizzled with whitish.

Skull.—The skull shows no special peculiarities. The portion of the premaxillæ appearing on the dorsal surface of skull is moderately enlarged.

Measurements.—Mr. Miller made the following measurements on the specimens in the Paris Museum: Java, male, head and body 280 mm., tail 220, hind part, with and without claws, 60, 57; Java, female(?), 290–235–65, 61; Malacca, female, 300–255–60, 57. For

¹ Mr. Miller noted that the three specimens in the Paris Museum showed no peculiarities, so that specimens from the Malay Peninsula are here regarded as typical *Sciurus hippurus*. It is very probable, however, that when good series of skins and skulls from Java are compared with specimens from the mainland that constant differences will be found between them, in which case Gray's name, *rufogaster*, is available for the peninsula form.

² Color terms in this paper are taken from Ridgway, Nomenclature of Colors for Naturalists, Boston, 1886.

measurements of the specimens in U. S. National Museum, see table, page 29.

Specimens examined.—Two from Trong, Lower Siam, and one from the east coast of Johore.

SCIURUS HIPPUROSUS, new species

Type.—Skin and skull of adult female, Cat. No. 141,031, U. S. N. M., collected at Tarussan Bay, west coast of Sumatra, December 18, 1904, by Dr. W. L. Abbott. Original number, 3826.

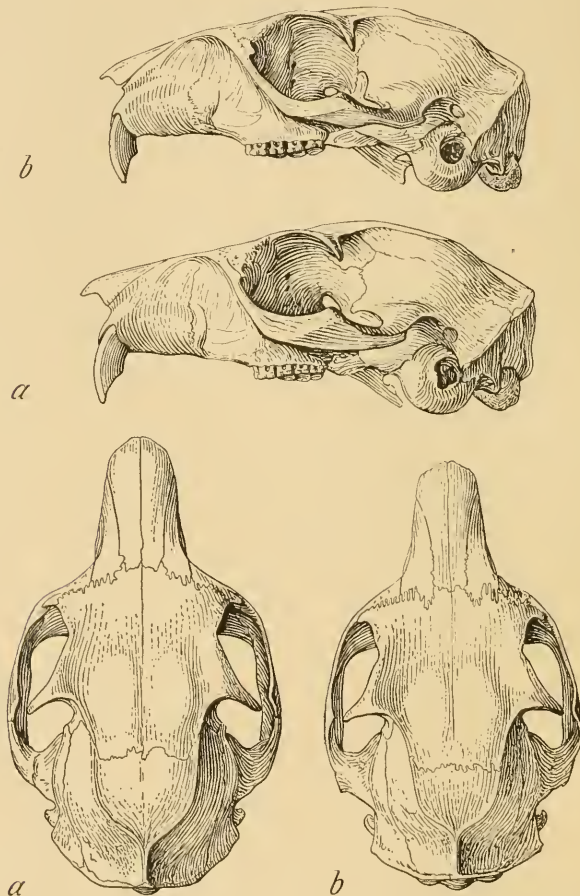


Fig. 12.—*a*, Cat. No. 141,031, Type of *Sciurus hippurosus*, Tarussan Bay, Sumatra; natural size.

b, Cat. No. 142,274, Type of *Sciurus hippurellus*, Landak River, western Borneo; natural size.

Diagnostic characters.—Similar to *Sciurus hippurus*, but larger, and with dorsal portion of the premaxillæ distinctly narrower.

Color.—*Sciurus hippurosus* so closely resembles *S. hippurus* that no detailed description is necessary. The underparts average perhaps a trifle lighter in color than they do in the mainland form, and a little more tawny is found in the upper parts.

Skull.—In addition to its average larger size, the skull of *Sciurus hippurosus* is distinguished from that of its allies by its relatively more slender rostrum, narrow dorsal surface of the premaxillæ, and heavier zygomata. (See figure 12, a.)

Measurements.—See table, page 29.

Specimens examined.—Three from Tarussan Bay, on the west coast of Sumatra, and one from Besitan River, on the east coast.

Remarks.—The three specimens from Tarussan Bay are uniform in all respects. That from the Besitan River has the underparts as dark as they are in the peninsula specimens, while above in the middle line the raw sienna color is replaced by rather bright tawny. The skull of this specimen is peculiar in lacking the small upper premolars and shows no place where they might have been. Should more material from eastern Sumatra show these differences to be constant, it would establish the existence of two forms of this squirrel in Sumatra.

SCIURUS HIPPURELLUS, new species

Type.—Adult female, skin and skull, Cat. No. 142,274, U. S. N. M., collected at Batu Ampar, on the Landak River, western Borneo, July 11, 1905, by Dr. W. L. Abbott. Original number, 4260.

Diagnostic characters.—Similar to *Sciurus hippurus*, but smaller and with dorsal surface of premaxillæ broad. (See fig. 12.)

Color.—*Sciurus hippurellus* so closely resembles *S. hippurus* in color that no detailed description is necessary, but it differs in the following particulars: The greater portion of the outside of the forearm is concolor with the back and has only a narrow streak of gray down the forearm instead of the whole outer surface being gray, as in the previous forms; the thighs are less gray than in the preceding species, being encroached on by the color of the back; traces of the color of the back extend on the upper surface of the tail for nearly one-third its length; the underparts are a lighter and brighter hazel, inclining to Ridgway's orange-rufous.

Skull.—Besides its smaller size, the skull of *Sciurus hippurellus* is distinguished by its heavier rostrum, broad expanse of the premaxillæ on its upper surface, and more slender zygomata. (Fig. 12, b.)

Measurements.—See table, page 29.

Specimens examined.—Three—two from the Landak River and one from the Kapuas River, below Tyan, western Borneo.

Remarks.—This species is quite closely related to the squirrels from Sumatra and the Malay Peninsula and very different in point of coloration from the race inhabiting northern Borneo.

SCIURUS GRAYI Bonhote

1867. *Macroxus rufogaster* var. *Borneensis* GRAY, Ann. Mag. Nat. Hist., 3d ser., XX, 1867, p. 283—not *Sciurus borneensis* (Müller and Schlegel), 1839-44.

1901. *Sciurus hippurus Grayi* BONHOTE, Ann. Mag. Nat. Hist., 7th ser., VII, February, 1901, p. 171, foot-note.

Diagnostic characters.—A member of the *Sciurus hippurus* group, with the color of middle line of the back very dissimilar to the sides, closely resembling burnt sienna, sparsely grizzled with black.

Color.—This species differs in color from *Sciurus hippurus* described above as follows: The color of the sides is found on the top of the head as far forward as the eyes, instead of to the ears only; the mid-dorsal area for a width of 30-40 mm., beginning at the base of the neck and extending on base of the tail above, differs in color from the sides, being like Ridgway's burnt sienna, sparingly grizzled with black; the grizzle of the upper neck and sides consists of black and tawny, instead of black and raw sienna; the black of the tail has more of a brownish cast; the underparts are dark as they are in the squirrel from the Malay Peninsula; the outer side of the forearm is gray, as in the Sumatran and peninsular forms, and not concolor with the sides, as in the other Bornean species.

Skull.—The skull of *Sciurus grayi* closely resembles that of *Sciurus hippurellus*.

Measurements.—See table, page 29.

Specimens examined.—Six, from northern Borneo.

Remarks.—This species is very distinct from the other known members of this group and shows more differences from the west Borneo form than the latter does from Sumatran and Malay Peninsula forms.

External and cranial measurements of squirrels of the Sciurus hippurus group.

Name.	Locality.	Catalogue number.	Sex and age.	Length of head and body.	Length of tail.	Length of hind foot with claws.	Greatest length of skull.	Zygomatic breadth.	Inter-orbital constriction.
				mm.	mm.	mm.	mm.	mm.	mm.
<i>S. hippurus</i> ...	Malay Peninsula, Trong.	84,433	Female, old.	260	255	63	60.0	36.6	19.5
Do.....	do.....do.	83,499	Male, adult	240	260	62	58.4	34.9	18.5
Do.....	do.....E. coast Johore.	112,731	Female, adult.	258	255	63	57.5	35.4	20.9
<i>S. hippurosus</i> ..	Sumatra, Tarussan Bay	141,031 ¹	Female, old	265	270	68	60.8	37.8	20.0
Do.....	do.....do.	141,032	Female, adult.	252	270	66	58.5	35.0	20.5
Do.....	do.....do.	141,033	.....do.	255	275	65	59.6	36.0	19.5
Do.....	do.....Besitan River..	143,399	Male, adult....	260	250	62	57.8	34.0	19.6
<i>S. hippurellus</i> .	Borneo, Kapuas River, below Tyan.	142,272	.....do.	250	250	61	55.7	34.2	18.2
Do.....	Borneo, Landak River	142,273	Female, adult..	240	260	61	56.1	34.2	19.5
Do.....	do.....do.	142,274 ¹	Female, old ..	250	280	63	58.5	35.7	19.7
<i>S. grayi</i>	do.....Mt. Salikan	83,932	Male, adult....	.....	.....	63	57.4	34.2	19.4
Do.....	do.....do.	83,933	.....do.	.....	.....	61	.....	.....	.....
Do.....	do.....Baram River	105,592	Female, adult..	.....	.....	60	.....	33.8	19.2
Do.....	do.....Baram Dist.	141,468	Male, adult....	.....	.....	58	.....	.....	.....
Do.....	do.....do.	141,469	Female, adult..	.....	.....	58	.....	.....	.....
Do.....	do.....Mt. Dulit	141,470	Male, adult ..	.....	.....	61	.....	.....	.....

¹Type.