

THE SQUIRRELS OF THE *SCIURUS VITTATUS* GROUP IN SUMATRA

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That more than one form of this variable group of squirrels should be found on Sumatra is not surprising when the large size and physical characteristics of that island are borne in mind. Sumatra is nearly one thousand miles in length, extending from northwest to southeast. The western portion is mountainous, averaging about 2000 feet in elevation, with here and there volcanic peaks 10,000 or 11,000 feet high; the eastern side consists of low and swampy land. Dr. W. L. Abbott during the last six years has collected squirrels of the *Sciurus vittatus* group at the following points along the coast: *East side*; Aru Bay, November to December, 1905; Salat Rupert, March, 1906; Kateman river, August, 1903; Indragiri river, September, 1901; *west side*; Loh Sidoh Bay, November, 1901; Tapanuli Bay, February and March, 1902; Tarussan Bay, December, 1904. See map, page 283. The only specimens of this group I have seen from the highlands of Sumatra are two from vicinity of Padang, kindly loaned by Mr. Witmer Stone, of the Academy of Natural Sciences of Philadelphia, to whom my thanks are due.

The type locality of *Sciurus vittatus* Raffles¹ is Bencoolen, on the southwest coast of Sumatra. Unfortunately, from here I have seen no examples. Mr. Bonhote's² statement that "the types of *S. vittatus*, which are in the British Museum, are absolutely indistinguishable from specimens taken in the Peninsula" and an examination of material in the National Museum show that *Sciurus vittatus* on Sumatra ranges throughout the low marshy country of the eastern side and extends either across the mountains or around the coast to Bencoolen, which seems rather unusual with so variable a group of squirrels; or else that the types of *Sciurus vittatus* were incorrectly labeled as coming from Bencoolen, a not improbable occurrence with specimens collected nearly a century ago. The examples nearest in locality to Bencoolen which I have seen are those from

¹ *Trans. Linnean Soc. London*, XIII, 1821-1822, p. 259.

² *Proc. Zool. Soc. London*, 1906, Vol. I, p. 6, June 7, 1906.

Tarussan Bay which are quite different from specimens collected along the low east coast of the island. The latter cannot be distinguished from *Sciurus peninsularis* Miller.¹ Until a good series of specimens is collected at Bencoolen the status of *Sciurus vittatus* Raffles and of *Sciurus peninsularis* Miller, must remain unsatisfactory. In this paper I use these two names as synonymous.

The differences in color of the different forms do not appear to be dependent upon season, but it is much to be regretted that material collected at all seasons is not available from each type locality. The east coast series, collected from March to September, is quite uniform and the relatively slight variations are individual and not seasonal. Two of the most differently colored forms (from Tarussan Bay and Tapanuli Bay) differ only a month as to season in which collected and are nearest geographically.

It is probable that the four forms here recognized are true subspecies of *Sciurus vittatus* and that if specimens were available from intermediate localities complete intergradation of one form to another would be found. As it is, the forms described below are quite distinct and the individual variation in any series is hardly great enough to connect one variety with another. Once the characters of the different forms are known, each of the thirty-four skins of squirrels of this group collected by Dr. Abbott in Sumatra can, without reference to the labels, be referred to one of the four different subspecies here described.

Apparently there are no characters in the skull by which the different subspecies may be distinguished from each other, except the slightly smaller size in the northern race.

KEY TO THE SUMATRAN SQUIRRELS OF THE *SCIURUS VITTATUS* GROUP

A. Pelage with scattered white hairs on underparts.

Sciurus vittatus albescens.

A'. Pelage without scattered white hairs on underparts.

C. Underparts lighter, deep ochraceous-buff. *Sciurus vittatus tarussanus.*

C'. Underparts darker, deep orange-rufous to ferruginous.

D. Upper surfaces of feet dull tawny or ochraceous, and black lateral stripe more distinct and clear. *Sciurus vittatus vittatus.*

D'. Upper surfaces of feet inclining to grayish, not tawny or ochraceous; black lateral stripe less clear and distinct.

Sciurus vittatus tapanulius.

SCIURUS VITTATUS VITTATUS Raffles

1822. *Sciurus vittatus* RAFFLES, Trans. Linnean Soc. London, XIII, p. 259.

¹ Smithsonian Miscell. Coll., XLV, No. 1420, November 6, 1903, p. 10.

1903. *Sciurus peninsularis* MILLER, Smithsonian Miscell. Coll., XLV, p. 10, November 6, 1903.¹

Co-types.—In British Museum, not seen.

Distribution.—Bencoolen (type locality) and the low swampy lands of southeastern Sumatra. See map, page 283.

Color.—Based on specimens from the low lands of eastern Sumatra, collected by Dr. Abbott. Upperparts, a fine grizzle of black and tawny-olive; tail similar, but grizzle coarser, sometimes appearing annulated and often somewhat rufescent toward the tip. Cheeks practically concolor with upperparts. Upper surfaces of feet, a fine grizzle of black and ochraceous or tawny-ochraceous. Underparts, orange-rufous or ochraceous-rufous, rarely deepening to ferruginous in some specimens. Light side stripe, about 5 mm. wide, dirty buff or cream-buff; black stripe, averaging 10–15 mm. wide, almost clear black.

Measurements.—Skin of No. 113156, United States National Museum, adult male, Indragiri river, Sumatra: Head and body, 220 mm.; tail vertebrae, 185; hind foot with and without claws, 48 and 44. Skull of No. 113156: Basal length, 44 mm.; zygomatic breadth, 31; interorbital constriction, 18.4; breadth of brain-case above roots of zygomata, 23.3.

Specimens examined.—Eleven skins and skulls; Salat Rupert, 3; Kateman river, 3; Indragiri river, 5.

SCIURUS VITTATUS TARUSSANUS new subspecies

Type.—Adult female, skin and skull, No. 141038, United States National Museum, collected at Tarussan Bay, west coast of Sumatra, December 28, 1904, by Dr. W. L. Abbott. Original number, 3857.

Distribution.—Vicinity of Tarussan Bay, Sumatra. See map, page 283.

Diagnostic characters.—Similar to typical *Sciurus vittatus*, but black side stripe rather narrower and less clear and underparts ochraceous or orange-ochraceous instead of ferruginous or orange-rufous.

Color.—Upperparts and tail, a fine grizzle, coarser on the tail

¹This species was described by Mr. Miller under the assumption that the Tapanuli Bay squirrels represented typical *vittatus*. Material at that time was insufficient to show that several forms of the *vittatus* group occurred on Sumatra. If, as Mr. Bonhote states, *S. peninsularis* is identical with the types of *S. vittatus*, *S. peninsularis* is a synonym of *S. vittatus* and the Tapanuli Bay specimens represent a new form, not named until now.

which is somewhat annulated and often slightly rufous at the tip, of black and tawny-olive. Cheeks generally concolor with upperparts, but sometimes inclining to yellowish. Upper surfaces of feet, a fine grizzle of ochraceous or tawny-ochraceous and black. Underparts and inner surfaces of legs varying between ochraceous and orange-ochraceous. Light lateral stripe, about 5 mm. wide, varying between buff and cream-buff in color; black stripe, 3-5 mm. wide posteriorly, 8-10 mm. anteriorly, finely and slightly grizzled with tawny-olive.

Measurements.—Skin of type: Head and body, 215 mm.; tail vertebræ, 185; hind foot, with and without claws, 48 and 44. Skull of type: Basal length, 43 mm.; zygomatic breadth, 31.4; interorbital constriction, 18.4; breadth of brain-case above roots of zygomata, 23.3; maxillary toothrow, 9.7.

Specimens examined.—Six skins, with skulls, from Tarussan Bay, and two skins, with skulls, from Padang Bovenland, at Batu Sangkar, Tanah Datar, 1,500-3,000 feet.

Remarks.—Although *Sciurus vittatus tarussanus* is nearer geographically to typical *vittatus* (type locality, Bencoolen), yet its lighter underparts and duller side stripes separate it sharply from *Sciurus peninsularis* Miller, which Mr. Bonhote states is identical with Raffles' types of *S. vittatus*.

SCIURUS VITTATUS TAPANULIUS new subspecies

Type.—Adult male, skin and skull, No. 114519, U. S. National Museum, collected at Tapanuli Bay, west coast of Sumatra, February 21, 1902, by Dr. W. L. Abbott. Original number, 1560.

Distribution.—Vicinity of Tapanuli Bay, Sumatra. See map, page 283.

Diagnostic characters.—Similar to typical *Sciurus vittatus*, but upper surfaces of feet grayish tawny-olive instead of ochraceous; cheeks more inclined to ochraceous-buff, and black lateral stripe narrower and less clear.

Color.—Upperparts and tail, as in typical form, a fine grizzle, (coarser on the tail, which is somewhat annulated), of black and tawny-olive. Upper surfaces of feet, a grizzle of tawny-olive, and black; underparts and inner sides of legs varying from orange-rufous to ferruginous. Cheeks, dull ochraceous-buff. Light lateral stripe, about 5 mm. wide, cream-buff; dark stripe, about 5 mm. wide posteriorly, 10 mm. anteriorly, black, but finely grizzled with the color of the underparts.

Measurements.—Skin of type: Head and body, 208 mm.; tail vertebræ, 185; hind foot, with and without claws, 45 and 41. Skull of type: Basal length, 43.3 mm.; zygomatic width, 29.5; interorbital constriction, 18; brain-case above roots of zygomata, 23; maxillary toothrow, 9.

Specimens examined.—Nine skins, with skulls, from Tapanuli Bay.

Remarks.—Although close to the typical form, *Sciurus vittatus tapanulius* is easily distinguished by having the upper surfaces of the feet generally concolor with the upper parts of body, by the yellowish cheeks, and by the less clear black side stripe. It somewhat resembles *S. ictericus* Miller¹ of the Batu Islands, but the cheeks are not nearly so yellow and the light lateral stripe is much clearer.

SCIURUS VITTATUS ALBESCENS (Bonhote)

1901. *Sciurus notatus albescens* BONHOTE, Ann. Mag. Nat. Hist., ser. 7, VII, May, 1901, p. 446.

Type.—British Museum, 85, 8, 1, 235. I have not seen this, but regard the Loh Sidoh Bay specimens as topotypes.

Distribution.—Northern Sumatra.

Diagnostic characters.—Differs from typical *Sciurus vittatus* in having paler underparts which, as well as the black lateral stripe, are lined with a few or many white hairs. Somewhat like *Sciurus pannovianus* Miller² but black stripe much narrower.

Color.—Upperparts and tail as in the typical form, a fine grizzle, coarser on the tail, of black and tawny-olive. Upper surfaces of feet a grizzle of ochraceous-buff and black. Cheeks, dull ochraceous-buff. Underparts and inner surfaces of legs, a color between orange-rufous and pinkish-buff, sprinkled with few or many white hairs. Light lateral stripe, 3–5 mm. wide, cream-buff; black stripe, 5 mm. wide posteriorly, 10 mm. anteriorly, sprinkled with few or many white hairs and some of the rufescent hairs of the underparts; the black hairs are dark to their bases where they are slate color.

Measurements.—No. 143400, United States National Museum, from Aru Bay: Head and body, 205 mm.; tail vertebræ, 200; hind foot, with and without claws, 44, 40. Skull: Basal length, 42.2 mm.; zygomatic width, 28.7; interorbital constriction, 17.5; brain-case above roots of zygomata, 23; maxillary toothrow, 9.

Specimens examined.—Two skins and skulls from Aru Bay, and eight from Loh Sidoh Bay.

¹ Smithsonian Miscell. Coll., XLV, p. 12, November 6, 1903.

² Smithsonian Miscell. Coll., XLV, p. 11, November 6, 1903.

Remarks.—Dr. Abbott's specimens, while differing in some respects from Bonhote's original description of *albescens*, are from too near the type locality to be considered anything else, at least until an actual comparison with the type has been made. The Aru Bay skins have less white on the underparts and lateral line than the majority of those from Loh Sidoh Bay, but two of the latter are exact matches for the Aru Bay specimens. The type of *Sciurus albescens* is said to have white hairs in the pelage above, but there are practically none in any of Dr. Abbott's specimens.



FIG. 29.—Sketch map of Sumatra showing distribution of squirrels of the *Scirus vittatus* group.