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THE PIGMY SQUIRRELS OF THE *NANNOSCIURUS*  
*MELANOTIS* GROUP.

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The material on which this paper is based comprises twenty-nine skins with skulls in the collection of the United States National Museum, three from Java, eleven from western Borneo, one from Sumatra, three from Sinkep and eleven from Banka. All except those from Java were collected by Dr. W. L. Abbott, and made up as dry skins in the field. The Javan specimens were obtained from Wilhelm Schlüter, Halle a. S. They were sent to him from Java in a preserving fluid, but were taken out and dried immediately on reaching his establishment. I have also had at my disposal manuscript notes on the original specimens of *Nannosciurus melanotis* in the Leyden Museum made by Mr. Gerrit S. Miller, Jr.

Two species have hitherto been recognized, *melanotis*\* recorded from Java, Sumatra and Borneo, and *pulcher* known only from Sinkep. The Sumatran and Bornean animals are here described as distinct as well as the one from Banka.

Key to the species of Pigmy Squirrels of the *Nannosciurus melanotis* group.

- a. Nape slightly grayer than crown, no distinct patch. *melanotis*.
- a<sup>1</sup>. Nape with distinct whitish patch.
  - b. Yellowish brown, upperparts finely and *evenly* grizzled with black.
  - c. Upperparts most like Ridgway's Isabella color with black grizzling. *borneanus*.
  - c<sup>1</sup>. Upperparts most like Ridgway's tawny olive with black grizzling. *bancanus*.

\* Here restricted to the Javan form. There were two specimens from Java in the original series and one each from Borneo and Sumatra. Mr. Miller thinks the description was based mainly on the Javan specimens.

*b*<sup>1</sup> Yellowish brown upperparts *irregularly* grizzled with black.

*d.* Size larger, gnathion to occipito-sphenoid suture more than 16 mm. *pulcher.*

*d*<sup>1</sup>. Size smaller, gnathion to occipito-sphenoid suture about 15 mm. *sumatranus.*

***Nannosciurus melanotis* (Müller and Schlegel).**

1839-44. *Sciurus melanotis* Müller and Schlegel, Verhandl. over de Natuurlijke Geschiedenes der Nederl. overzeesche Bezittingen, p. 98, Pl. XIV, fig 5.

*Cotypes.*—In the Leyden Museum, four specimens, one from Padang, western Sumatra (♀ *a.* No. 1. 1837), one from Borneo (♂ No. 3 *c.*), and two from Java (♀ *h.* No. 8 and *g.*, no sex, No. 7). The name *melanotis* is here restricted to the Javan animal, since most of the original series came from Java, and the greater part of the description is based on them.

*Characters.*—Distinct nape patch wanting, nape merely grayer than crown. General color darkest of the group.

*Color.*—Based on Nos. 121,494-121,496 U. S. N. M. Upper surface of head and body, outer surfaces of legs and sides a color intermediate between Ridgway's hazel and chestnut finely and evenly grizzled with black. A small area on the nape is lighter and similar to wood-brown. Hairs of the underparts blackish-slate at base, tipped with a dark vinaceous buff. Upper surface of feet similar in color to back. Postauricular spot black, conspicuous, extending from 5-7 mm. behind the ear. Outer side of ear black, inner side similar to back. Light head stripe vinaceous buff to whitish about 1.5 mm. wide in front and about twice as wide under the ear. Ring over the eye same color as head stripe, about 1 mm. wide. Preorbital stripe black, about 1 mm. wide. Hairs of tail (except at tip) ringed as follows: Hazel, blackish, rich hazel, black, light vinaceous buff, and inconspicuous black tip. At tip of tail the hairs are longer and after the second hazel ring are blackish brown.

*Skull and teeth.*—These show no characters by which to distinguish *Nannosciurus melanotis* from other related species except *N. pulcher* which has a slightly larger skull.

*Measurements.*—The hind feet with claws in the three specimens measure 22.2, 22.5, 22.7 mm.; gnathion to occipito-sphenoid suture, 15.5 mm.; greatest breadth of skull, 15.9-16.5; interorbital constriction, 9.5-10 mm.

*Specimens examined.*—Three from near Batavia, Java—one male, one female and one of unknown sex.

*Remarks.*—The above three skins differ in their red brown color from all the other specimens of this group, from the figure published with the original description and, judging from Mr. Miller's notes on the original series in Leyden, from the cotypes. It is to be noted that the cotypes are mounted and have been exhibited for over half a century, and that the three specimens in the National Museum have been in a preserving fluid. It is possible that when more specimens are secured from Java two forms will be found to occur on that island. The above three specimens, the cotypes, and the original figure all agree in the absence of a well defined nape patch

**Nannosciurus pulcher** Miller.

1902. *Nannosciurus pulcher* Miller, Proc. Acad. Nat. Sci., Philadelphia, March, 1902, p. 154. Issued June 11, 1902.

*Type*.—Adult female, skin and skull, No. 113,131, United States National Museum, from Sinkep Island, south China Sea.

*Characters*.—A large member of the *melanotis* group with well defined nape patch, the yellow-brown body not distinctly grizzled. Gnathion to occipito-sphenoid suture more than 16 mm.

*Color*.—Upperparts and sides of body and outer side of legs like a light Isabella color of Ridgway tinged with olive, or like a pale raw umber, with an uneven speckling of black. Top of head darker inclining to a dull dark tawny ochraceous. Hairs of underparts with blackish slate bases and ochraceous buff tips. Hind feet indistinct, dull tawny; fore feet like back. The light colored head stripe is distinctly tinged with yellow in the type, in No. 123,098 with pinkish buff, and in No. 123,099 is nearly clear white. The stripe is about 2 mm. wide in front and 3-5 mm. under the ear. In the type there is scarcely any indication of a supraorbital halfring; in the other two specimens there is a dull pinkish-buff line about 1 mm. wide. Nape patch whitish tinged with yellowish in the type, with vinaceous buff in No. 123,098. External surface of ears black, internal similar to back. Postauricular spot black, not so large as in *melanotis*, extending 2-3 mm. behind ear. Preorbital stripe blackish, 1-2 mm. wide. Hairs of tail ringed as follows: dull ochraceous, blackish, tawny-ochraceous, black, white, black. At the tip of the tail after the second tawny ring the rest of the hair is black.

*Skull*.—The skull is a little larger than that of the other members of this group, gnathion to occipito-sphenoid suture about 16.5 mm. instead of 15-15.5 in the other species.

*Measurements*.—Head and body, 85-95; tail vertebrae, 70-77; hind foot with claws, 23.3-23.7. Skull: Gnathion to occipito-sphenoid suture, 16.4-16.7; greatest breadth, 16.7-17.2; interorbital constriction, 10-11.5.

*Specimens examined*.—Three—two males and one female; all from Sinkep Island.

*Remarks*.—*Nannosciurus pulcher* is most like the Sumatra animal, from which it differs by its slightly larger skull and slightly brighter color. It is conspicuously different from *N. melanotis* in its yellow brown instead of red brown color and in its distinct nape patch.

**Nannosciurus sumatranus** sp. nov.

*Type*.—Adult male, skin and skull, No. 141,058, United States National Museum. Collected at Tarussan Bay, western Sumatra, January 16, 1905, by Dr. W. L. Abbott. Original number 3946.

*Characters*.—Very similar to *Nannosciurus pulcher* Miller, from which it differs in its smaller size and less bright coloration of the upperparts; gnathion to occipito-sphenoid suture 15-15.5 mm. instead of 16-16.5 mm.

*Color*.—Type: General color of upperparts most like Ridgway's Isabella

color, irregularly lined with blackish. Top of head dull ochraceous, lined with black. Feet dull ochraceous. Hairs of underparts slaty at base, dull ochraceous buff at ends. Light head stripe whitish tinged with buffy, 2 mm. wide in front and 5 mm. wide under ear. Preorbital stripe black 1.5-2 mm. wide. Supraorbital halfring not distinct, about 1 mm. or less wide, dull ochraceous buff. External surface of ears black, internal surface similar to top of head. Postauricular spot black, not large, extending 1-2 mm. behind ear. Nape patch well defined, light cream to pinkish buff. Hairs of tail ringed as follows: Dull ochraceous, blackish, dull ochraceous, black, white, black. At tip of tail, after the second ochraceous ring, the hairs are uniformly black.

*Skull.*—The skull of *N. sumatranus* shows no appreciable differences from that of related species except *N. pulcher* which is slightly larger.

*Measurements.*—Type: Head and body, 83; tail vertebrae, 72; hind foot with claws, 23.8. Skull: Gnatlion to occipito-sphenoid suture, 15; greatest width, 15.8; interorbital constriction, 9.6; maxillary toothrow (alveoli), 4.

*Specimens examined.*—One, the type.

*Remarks.*—This is the Sumatran representative of the group. The single specimen agrees closely with Mr. Miller's notes on the Padang specimen in the Leyden Museum. It differs from the Javan specimens in having a conspicuous nape patch, wide head stripe under the ear, and small postauricular spot, as well as in its general yellow brown instead of red brown coloration.

#### ***Nannosciurus borneanus* sp. nov.**

*Type.*—Adult female, skin and skull, No. 142,271, United States National Museum. Collected in Sanggan, western Borneo, August 23, 1905, by Dr. W. L. Abbott. Original number 4368.

*Characters.*—A yellow brown member of the group, with distinctly grizzled back, and well marked, light colored nape patch, which, however, is not so light nor distinct as it is in *Nannosciurus pulcher* or *sumatranus*.

*Color.*—Type: Upperparts and sides of body and outer sides of legs a fine distinct, even grizzle of a light Isabella color tinged with olive, and black. Top of head a grizzle of dull ochraceous and black. Hind feet a dull hazel; forefeet similar to back. Base of hairs of underparts slate color; ends dull ochraceous buff. Head stripe, whitish, slightly tinged with buffy, nearly 2 mm. wide in front and 5-7 mm. wide under the ear. Preorbital stripe narrow, about 1 mm. wide, blackish, specked with ochraceous. Supraorbital halfring not well marked, 1 mm. or less, dull ochraceous. Internal surface of ears similar to top of head. External surface of ears black. Postauricular spot black, extending 4-5 mm. behind ear. Nape patch well defined, dirty white, grayish posteriorly. Hairs of tail ringed thus: dull ochraceous, blackish ochraceous, black, white, black. At tip of tail, after the second ochraceous ring, the hairs are black to their ends.

*Skull.*—There are no constant characters by which the skull of *Nannosciurus borneanus* can be told with certainty from that of other members of the group, except *pulcher* which has a slightly larger skull.

*Measurements.*—Type: Head and body, 86 (75–90);\* tail vertebrae, 65 (64–70); hind foot with claws, 22.6 (22–23.9). Skull of type: Greatest length, 25.3; basal length, 20; basilar length, 19.2; palatal length, 12.1; greatest breadth, 16.8 (14.9–16.8); gnathion to occipito-sphenoid suture, 15.6 (14.7–15.6); interorbital constriction, 10.6; greatest breadth of braincase, 14; nasals (median edge), 11; maxillary toothrow (alveoli), 3.8; mandible (condyle to front of symphysis), 14; mandibular toothrow (alveoli), 3.6

*Specimens examined.*—Ten males and one female, all from western Borneo, near the coast.

*Remarks.*—The type specimen represents the series very well; a few of the specimens are more ochraceous in the underparts and some have irregular tinges of buffy or vinaceous buffy in the nape patch or on the posterior part of the light head stripe, but never so much as in the Pigmy Squirrel from Banka. *Nannosciurus borneanus* is easily distinguishable from *N. pulcher* and *sumatranus* by its conspicuous fine grizzle, and from *melanotis* and *bancanus* by its lighter color and clear and distinct nape patch.

#### ***Nannosciurus bancanus* sp. nov.**

*Type.*—Skin and skull of adult female, No. 124,880, United States National Museum. Collected at Klabat Bay, Island of Banka, east of Sumatra, June 24, 1904, by Dr. W. L. Abbott. Original number 3430.

*Characters.*—Most like *Nannosciurus borneanus*, from which it differs in its generally darker color, more obscured nape patch and buffy face stripes.

*Color.*—Type: Upperparts and sides of body, and outer surfaces of legs, a fine grizzle of a color between Ridgway's tawny-olive and raw umber, and black, the former color in excess. Top of head dull tawny ochraceous grizzled with black. Underparts, including inner side of legs, with the hairs slaty at base, and ochraceous buff for the rest of their length. Forefeet similar to back; hairs of hind feet dull tawny. Light face stripe, about 1 mm. wide at nostril, 5 mm. wide beneath ear, generally buffy in color; for the first 2 or 3 mm. just behind nostril it is ochraceous buff and under the ear it inclines toward vinaceous buff. Preorbital stripe narrow, black, and slightly sprinkled with tawny. Supraorbicular halfring inconspicuous, dull ochraceous buff, scarcely 1 mm. wide. External surface of ears black; postauricular spot black; extending about 4 mm. behind ear. Internal surface of ear similar to top of head. Nape patch distinctly present, but not clear, a dark, dull pinkish buff of Ridgway, irregularly lined with blackish. Hairs of tail ringed as follows: dull ochraceous, blackish, ochraceous, black, white, black. At tip of tail the hairs are uniformly blackish after the second ochraceous ring.

*Skull.*—The skull of *Nannosciurus bancanus* shows no characters by which it can be distinguished from that of other species, except from *N. pulcher* which has a larger skull.

\* Figures in parentheses are those of the extremes of the series.

*Measurements.*—Type: Head and body, 82 (78-90); tail vertebrae, 63 (63-70); hind foot with claws, 22 (22-23.6). Skull of type: Greatest length, 24.6; basal length, 18.8; basilar length, 17.6; palatal length, 10.8; greatest width, 15.8 (15.7-16.4); interorbital constriction, 10.1; greatest breadth of braincase, 13.7; gnathion to occipito-sphenoid suture, 15 (14.8-15.6); maxillary toothrow (alveoli), 3.7; mandible, condyle to front of symphysis, 13.5; mandibular toothrow (alveoli), 4.

*Specimens examined.*—Eight males and two females, from Klabat Bay, Banka; one male from Point Tedong, Banka.

*Remarks.*—None of the series show any important deviation from the type specimen. Two or three individuals have the nape patch slightly lighter in color than in the type, in this respect being quite similar to those of the Bornean series with the dull nape patches; but the general color of the body is always darker. The affinity of *Nannosciurus bancanus* to *N. borneanus* instead of to *N. sumatranus* is curious, as Banka is separated from Borneo by a wide deep channel, Karimata Strait, and from Sumatra by a narrow and comparatively shallow channel. One would expect the relationship to be the reverse.