



Sciurus sanborni (Rodentia: Sciuridae)

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Abstract: *Sciurus sanborni* Osgood, 1944 is a rodent commonly called Sanborn's squirrel or ardilla de Sanborn. *S. sanborni* is a small squirrel with olive brown dorsum, buff eye rings, and usually, white underparts. *S. sanborni* is 1 of 28 species in the genus *Sciurus*, and a rare endemic of Peru that is found in lowland Amazonian forest between 300 and 580 m elevation. The Peruvian Ministry of the Environment classifies *S. sanborni* as "Vulnerable" and the International Union for Conservation of Nature and Natural Resources considers the species to be "Data Deficient;" habitat destruction is the main threat.

Key words: ardilla de Sanborn, endemic species, Neotropics, Peru, Sanborn's squirrel, South America, tree squirrel

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Sciurus sanborni Osgood, 1944

Sanborn's Squirrel

Sciurus sanborni Osgood, 1944:191. Type locality "La Pampa, between Rio Inambari and Rio Tambopata, about twenty miles north of Santo Domingo, Madre de Dios, Peru. Altitude about 1,900 feet."

CONTEXT AND CONTENT. Order Rodentia, suborder Sciuromorpha, family Sciuridae, subfamily Sciurinae, tribe Sciurini, genus *Sciurus*, subgenus *Guerlinguetus*. No subspecies are recognized for *Sciurus sanborni* (Wilson and Reeder 2005; Thorington et al. 2012).

NOMENCLATURE NOTES. *Sciurus sanborni* was retained as a valid species by Cabrera (1961) and Thorington and Hoffmann (2005). Osgood (1944:192) noted the species "differs so widely from all heretofore known species that its distinctness is scarcely to be doubted." However, additional study may be necessary to clarify the validity and affinities of this taxon as its status as a unique species was questioned by Voss and Emmons (1996). Emmons and Feer (1997) suggest that *S. sanborni* may be a subspecies of *Sciurus aestuans*, whereas Osgood (1944) notes that *Sciurus ignitus* might be most similar.

Sciurus is the Latin word for "squirrel" (Jaeger 1955), and is derived from the Greek *skia*, meaning "shade," and *oura*, meaning "tail" (Borrer 1960). The specific epithet refers to the collector of the type specimen, Colin C. Sanborn (Osgood 1944). Common names include ardilla de Sanborn (Pacheco et al. 2009).



Fig. 1.—An adult *Sciurus sanborni* from Madre de Dios, Peru. Photograph taken 26 March 2008 by Tor Egil Høgsås used with permission.

DIAGNOSIS

The range of *Sciurus sanborni* overlaps with the range of the northern Amazon red squirrel (*Sciurus igniventris*) and the southern Amazon red squirrel (*Sciurus spadiceus*), Junín red squirrel (*Sciurus pyrrhinus*), Bolivian squirrel (*Sciurus ignitus*), and Amazon dwarf squirrel (*Microsciurus flaviventer*).

S. sanborni can be distinguished from other sympatric sciurids by its smaller body size and coloration pattern (Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). *S. igniventris* is 60%, *S. spadiceus* is 58%, and *S. pyrrhinus* is 40% larger in total length compared to *S. sanborni* (313–359 mm), and their coloration is mainly a variation of red and orange, not olive brown like *S. sanborni* (Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). *S. ignitus* is 10–15% larger in total length, and although the dorsum is brown, *S. ignitus* has a gray inguinal region, feet the same color as the dorsum, and an indistinct pale buffy to ochraceous eye ring (Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). The Amazon dwarf squirrel is also brown but is 20–25% smaller than *S. sanborni* with smaller ears that do not protrude above the crown (Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012).

GENERAL CHARACTERS

Sciurus sanborni is a small-bodied tree squirrel with uniform olive brown dorsum, bright pale buff eye rings and areas around the mouth, and thinly haired ears that protrude above the crown and have bright white or buff patches behind each

ear (Osgood 1944; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). The feet are yellowish and sometimes distinctly paler than the dorsum (Emmons and Feer 1997). The venter, including inner thighs, is entirely pure white or yellowish orange and contrasts sharply with the sides (Osgood 1944; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). Usually the tail is the same color as the dorsum but faint black banding can occur on the tail when individuals have a more grizzled appearance (Fig. 1; Eisenberg and Redford 1999; Thorington et al. 2012). There is no geographic variation in coloration (Thorington et al. 2012).

External measurements (ranges or mean; mm) for *S. sanborni* were: total length, 313–359 (Osgood 1944; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012); length of head and body, 152–175 (Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012); length of tail, 161–184 (Osgood 1944; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012); length of hind foot, 44–50 (Osgood 1944; Emmons and Feer 1997); and length of ears, 20–21 (Emmons and Feer 1997; Eisenberg and Redford 1999). Cranial measurements (1 female; mm) were: total length, 42.3; basilar length, 32.3; zygomatic breadth, 23.9; breadth of braincase, 21.1; interorbital breadth, 13.9; breadth between tips of postorbital processes, 19; median length of nasals, 9.3; diastema, 10.8; width



Fig. 2.—Geographic distribution of *Sciurus sanborni* modified from Thorington et al. (2012). Created by M. J. Merrick.

of palate between inner bases of premolars, 6.9; length of upper tooththrow, 6.9; length of exposed front surface of upper incisors, 5; and anteroposterior width of upper incisor, 1.3 (Osgood 1944).

DISTRIBUTION

Sciurus sanborni is a rare endemic of the Madre de Dios region in southeastern Peru, found in lowland Amazonian rainforest between the mouth of the Río Manu and the Río Tambopata at elevations between 300 and 580 m (Fig. 2; Emmons and Feer 1997; Eisenberg and Redford 1999; Pacheco 2002; Wilson and Reeder 2005; Amori et al. 2008; Thorington et al. 2012). *S. sanborni* is also likely to be found in Bolivia (Emmons and Feer 1997). The total range for *S. sanborni* is 48,842.21 km² (Amori et al. 2013).

FOSSIL RECORD

Sciurus sanborni, and the family Sciuridae in general, lack a fossil record in South America (Simpson 1980). However, tree squirrels are believed to have been in South America since the Pleistocene (Simpson 1980).

FORM AND FUNCTION

In the subgenus *Guerlinguetus*, the sphenopalatine foramen in the skull is slightly larger than the sphenoidal fissure and the orbit is about medium length (Fig. 3; Moore 1959). *Sciurus sanborni* has a narrow and anteriorly depressed skull, the rostral portion has evenly sloping sides, the nasals are short, the postorbital processes are short and weak and end at the level of the last molar, the anterior edge of the maxillary root of the zygoma is not continuous with a rounded and outer edge of the ascending premaxilla, the palate is wide and evenly convex and does not have a median ridge, and the auditory bullae are relatively large and slightly greater in size than in *S. aestuans* (Osgood 1944). The incisors in *S. sanborni* are very slender and weak, the upper teeth are very short, P3 is absent, P4 is small (< 33% the size of the molar), and M2 has a metastyle more evident than in *S. ignitus* and similar to that of *S. aestuans* (Osgood 1944).

ONTOGENY AND REPRODUCTION

The type specimen, a subadult female, was collected 23 October 1941. The number of mammae was not evident (Osgood 1944). No other information is available.

ECOLOGY

Sciurus sanborni inhabits lowland rainforest (Emmons and Feer 1997; Thorington et al. 2012) and high ground forest with a 40–50 m canopy and dark open understory at elevations between 300 and 580 m (Terborgh et al. 1984; Emmons and Feer 1997).

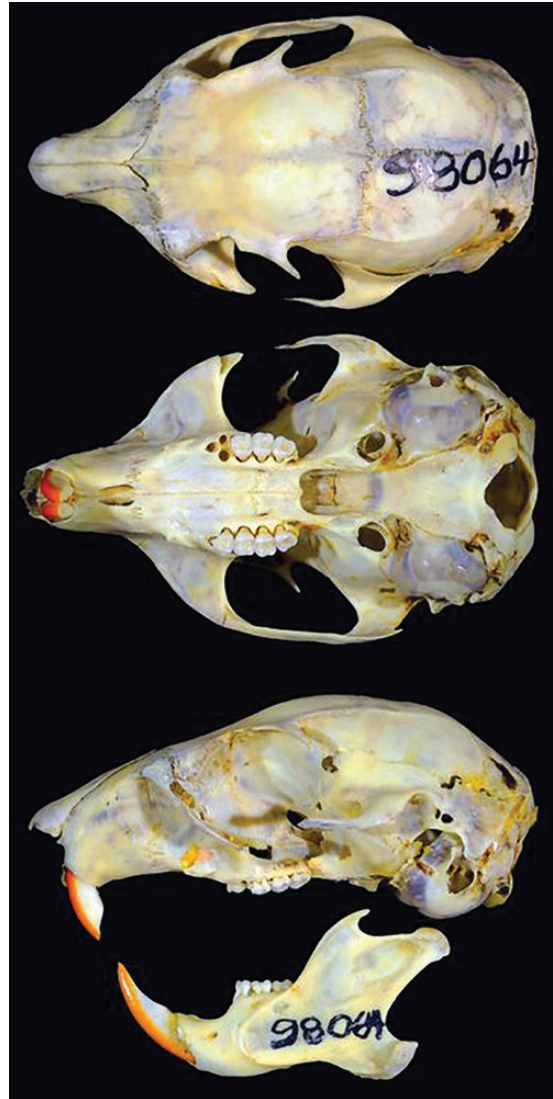


Fig. 3.—Dorsal, ventral, and lateral views of skull and lateral view of mandible of an adult male *Sciurus sanborni* (FMNH [Field Museum of Natural History] #98064) from Altamira, Manu, Madre de Dios, Peru. Photographs taken by B. Patterson used with permission. Greatest length of skull is 46.1 mm.

In Manu National Park, *S. sanborni* is found at elevations of 350–400 m (Solari et al. 2006), abundance is low, and the species is considered rare (Terborgh et al. 1984). It is diurnal (Terborgh et al. 1984; Thorington et al. 2012) and appears to forage on the ground and in the understory (Terborgh et al. 1984).

Sciurus sanborni occurred at the same locations as common opossum (*Didelphis marsupialis*), white-bellied slender opossum (*Marmosops noctivagus*), bare-tailed woolly mouse opossum (*Micoureus regina*), Goeldi's marmoset (*Callimico goeldii*), white-fronted capuchin (*Cebus albifrons cuscinus*), tufted capuchin (*Cebus apella peruanus*), emperor tamarin (*Saguinus imperator*), black-capped squirrel monkey (*Saimiri boliviensis peruviansis*), black-headed night monkey (*Aotus nigriceps*), brown titi (*Callicebus brunneus*), Rio Tapajos saki (*Pithecia*

irrorata), Jamaica fruit-eating bat (*Artibeus jamaicensis*), southern chestnut short-tailed bat (*Carollia castanea*), silky short-tailed bat (*Carollia brevicauda*), Seba's short-tailed bat (*Carollia perspicillata*), white-throated round-eared bat (*Lophostoma silvicolum*), MacConnell's bat (*Mesophylla macconnelli*), lesser spear-nosed bat (*Phyllostomus elongates*), fringe-lipped bat (*Trachops cirrhosis*), ocelot (*Leopardus pardalis*), margay (*Leopardus wiedii*), short-eared dog (*Atelocynus microtis*), Neotropical otter (*Lontra longicaudis*), giant otter (*Pteronura brasiliensis*), South American coati (*Nasua nasua*), Amazon dwarf squirrel, *Sciurus ignitus*, *Sciurus spadiceus*, Amazonian marsh rat (*Holochilus sciureus*), white-bellied oecomys (*Oecomys bicolor*), small-eared colilargo (*Oligoryzomys microtis*), western Amazonian oryzomys (*Oryzomys perenensis*), capybara (*Hydrochoerus hydrochaeris*), Central American agouti (*Dasyprocta punctata*), green acouchi (*Myoprocta pratti*), Simon's spiny rat (*Proechimys simonsi*), and Steere's spiny rat (*Proechimys steerei*—Solari et al. 2006).

CONSERVATION

Sciurus sanborni is a rare endemic of Peru and classified as “Vulnerable” in Peru (under DS N° 034-2004-AG—Pacheco et al. 2009) and “Data Deficient” by the International Union for Conservation of Nature and Natural Resources (Amori et al. 2008). *S. sanborni* is not likely threatened by hunters because of its small size (Thorington et al. 2012) but habitat destruction is a possible threat (Amori et al. 2008). Management practices at the 15,300 km² Manu National Park protect *S. sanborni* (Medina et al. 2012).

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