

Sciurus pyrrhinus (Rodentia: Sciuridae)

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Abstract: *Sciurus pyrrhinus* O. Thomas, 1898 is a rodent commonly called the Junín red squirrel or ardilla rojiza. This large-bodied, arboreal species is characterized by a rufous dorsum and an orange tail, and is 1 of 28 species in the genus *Sciurus*. Endemic to Peru, *S. pyrrhinus* is found on the eastern slopes of the Andes between 600 and 1,500 m above sea level, spanning rain forest and montane forest habitat. Described as common within its limited distribution, the Peruvian Ministry of the Environment classifies *S. pyrrhinus* as “Vulnerable” and the International Union for Conservation of Nature and Natural Resources considers it “Data Deficient.”

Key words: ardilla rojiza, endemic species, Junín red squirrel, lowland tropical forest, montane forest, Neotropics, Peru, South America

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Sciurus pyrrhinus O. Thomas, 1898 Junín Red Squirrel

Sciurus variabilis von Tschudi, 1844:155. Type locality “Peru.” Not *Sciurus granatensis variabilis* (Geoffrey Saint-Hilaire, 1832).

Sciurus pyrrhinus: O. Thomas, 1898:265. Type locality “Garita del Sol, Vitoc, Peru.” First use of current name combination.

Mesosciurus pyrrhinus: J. A. Allen, 1915:252. Name combination.

CONTEXT AND CONTENT. Order Rodentia, suborder Sciuromorpha, family Sciuridae, subfamily Sciurinae, tribe Sciurini, genus *Sciurus*, subgenus *Hadrosciurus*. No subspecies are recognized for *S. pyrrhinus* (Thorington and Hoffmann 2005). Allen (1915) placed *S. pyrrhinus* in the subgenus *Mesosciurus*.

NOMENCLATURE NOTES. Johann Jakob von Tschudi (1844) mistakenly applied the name *Sciurus variabilis* to specimens (Hershkovitz 1987), believing that they were representatives of a Central American species, *Sciurus variabilis* (Geoffroy Saint-Hilaire, 1832), from northern Colombia (Hershkovitz 1947) and now considered a subspecies of *S. granatensis* (Cabrera 1961; Thorington et al. 2012). Thomas (1893) originally followed von Tschudi, but subsequently corrected this error (Thomas 1898).

Sciurus is the Latin word for squirrel (Jaeger 1955), and is derived from the Greek *skia*, meaning shade, and *oura*,

meaning tail (Borrer 1960). Etymologically, the derivation of the specific epithet *pyrrhinus* is unclear because Thomas (1898) does not elaborate. However, *pyrrhinus* may refer to the copper tinge of the dorsum, from the Greek *pyrrhos*, meaning flame-colored (Brown 1954). Additional common names include ardilla rojiza (Pacheco et al. 2009; Quintana et al. 2009), ardilla (Emmons and Feer 1997), ardilla colorada (Aquino and Torres 2010), and ardilla rojy (Schulte-Herbrüggen and Rossiter 2003).



Fig. 1.—An adult *Sciurus pyrrhinus* from Madre de Dios, Peru. Photograph taken near Las Piedras Biological Station by Aniket Sardana used with permission.

DIAGNOSIS

The range of *Sciurus pyrrhinus* potentially overlaps with the ranges of the northern Amazon red squirrel (*S. igniventris*), the southern Amazon red squirrel (*S. spadiceus*), the Bolivian squirrel (*S. ignitus*), Sanborn's squirrel (*S. sanborni*), and the Amazon dwarf squirrel (*Microsciurus flaviventer*—Emmons and Feer 1997; Eisenberg and Redford 1999; Hammer and Tatum-Hume 2003; Thorington et al. 2012). *S. pyrrhinus* can be distinguished from other sympatric sciurids by body size and coloration (Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). *M. flaviventer* is 50% and *S. ignitus* and *S. sanborni* are 20–30% smaller in body size than *S. pyrrhinus* and their dorsal coloration is mainly brown, not red as in *S. pyrrhinus*. *S. igniventris* and *S. spadiceus* are 10–20% larger in body size, have tails longer than head and body length, tend to have more intense coloration on their dorsum, and the crown of the head is grizzled with black compared to *S. pyrrhinus*, which is uniformly chestnut or dark red on its dorsum and has a tail shorter than head and body length (Thomas 1898; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). The evolutionary relationships and distinctiveness of this taxon from the Amazon red squirrels (*S. igniventris* and *S. spadiceus*) require further scientific investigation (Emmons and Feer 1997).

GENERAL CHARACTERS

Sciurus pyrrhinus is a large-bodied tree squirrel with the feet, dorsum, ears, and crest of the head dark red, usually darkest on the head, and often speckled white (Figs. 1 and 2; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). The rufous dorsum is deeply grizzled with black hairs, which dwindle toward the sides and limbs (von Tschudi 1844; Thomas 1898). The sides of the muzzle and beneath the lower jaw are lighter than the rest of the head, and the ears are edged in black (von Tschudi 1844). The base of the tail is chestnut-brown and grizzled with black (Thomas 1898). Longer hairs on the distal one-half to two-thirds of the tail terminate in bright orange tips, providing an orange tinge to this section of the tail, and have 3 black rings, the 1st at the base of each hair. The tail terminates in a concentration of these brightly tipped hairs, causing the tail to have an orange to rufous tip (Thomas 1898; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). The venter may vary considerably in coloration, sometimes sharply delineated from the rest of the body; color variants include uniform rufous, uniform white, and orange with white patches at the sides (von Tschudi 1844; Thomas 1898; Allen 1915; Emmons and Feer 1997; Eisenberg and Redford 1999; Thorington et al. 2012). The uniformly black vibrissae are 127 mm long



Fig. 2.—Dorsal, ventral, and lateral views of skull and lateral view of mandible of an adult female *Sciurus pyrrhinus* (Field Museum of Natural History [FMNH] 24106) from Oxapampa, Pasco, Peru. Greatest length of skull is 57.7 mm. Photographs taken by B. D. Patterson used with permission.



Fig. 3.—Geographic distribution of *Sciurus pyrrhinus* modified from Thorington et al. (2012). Potential range extension to the east without voucher specimens is denoted by a question mark (?), and to the north into Ecuador from a specimen collected at the location denoted by a circle. Map created by M. J. Merrick.

(von Tschudi 1844). There is no distinct geographic variation recorded for the species (Thorington et al. 2012).

External measurements (mm; ranges or mean) for an unspecified number of specimens from Peru, including the female type of *S. pyrrhinus*, were: head and body length: 240–254; tail length: 208–254; hind-foot length: 59; ear length: 21 (von Tschudi 1844; Thomas 1898). Cranial measurements (mm) of the type specimen were: greatest skull length, 52; greatest skull breadth, 33.5; nasals, 16.5 by 8.4; interorbital breadth, 18; intertemporal breadth, 19; palate length from henselion, 26.7; length of upper tooth-series, 9.6; diastema length, 15.2; basilar length, 46 (Thomas 1898). Mean (range) of bacula measurements (mm) from 4 specimens collected in Peru were: length, 10.25 (10–11); average width, 1.15 (1.0–1.5); height of the proximal extremity, 2.73 (2.0–3.1); height of the distal hatchet, 2.76 (2.5–3.0—Didier 1955).

DISTRIBUTION

Sciurus pyrrhinus is endemic to Peru although the geographic range for the species remains poorly defined (Emmons and Feer 1997). Individuals were recently reported from Madre de Dios (Hammer and Tatum-Hume 2003; Schulte-Herbrüggen and Rossiter 2003), and also may have been sighted in Federico Roman, Bolivia, although no

specimens have been collected for a positive identification (Alverson et al. 2003; Quintana et al. 2009; Thorington et al. 2012). *S. pyrrhinus* is found on the eastern slopes of the Andes of central Peru in Huánuco, Pasco, Junín, Huancaavelica, Ayacucho, Cuzco, Ucayali, perhaps to San Martín, and in montane foothills and lowland tropical forests in Madre de Dios, between approximately 300 and 1,500 m above sea level (Fig. 3; von Tschudi 1844; Thomas 1927a, 1927b; Cabrera and Yepes 1960; Emmons and Feer 1997; Pacheco 2002; Hammer and Tatum-Hume 2003; Schulte-Herbrüggen and Rossiter 2003; Duff and Lawson 2004; Thorington and Hoffmann 2005; Pacheco et al. 2009; Aquino and Torres 2010; Thorington et al. 2012). A recently identified specimen collected in 1920 near Zamora, Ecuador, may indicate that the range of *S. pyrrhinus* extends along the eastern slopes of the Andes farther north than originally thought (Lee and Brant 2014).

FOSSIL RECORD

Sciurus pyrrhinus, and the family Sciuridae in general, lack a fossil record in South America. However, it is believed that tree squirrels have been in South America since the Pleistocene (Simpson 1980).

FORM AND FUNCTION

The cavern and septum of the thyroid cartilage are absent in *Sciurus pyrrhinus*. Johann Jakob von Tschudi (1844) also reports that this species has 1 lobe of the lung on the right-hand side of the thoracic cavity and 4 lobes on the left. The baculum of *S. pyrrhinus*, although similar to that of *S. spadiceus*, may be easily distinguished in that the body is thicker, the distal tip of the hatchet is more slender and hooked, and the spur is more pronounced (Didier 1955).

ECOLOGY

Sciurus pyrrhinus is an arboreal forest dweller found from lower-elevation rain forest to higher-elevation montane forest (Emmons and Feer 1997; Thorington et al. 2012). *S. pyrrhinus* frequently visits family farms (Aquino and Torres 2010) and has been sighted at a rate of 0.099 individuals/km in a lowland rain forest with boggy permanent patches of water in palm swamps or aguajales (Hammer and Tatum-Hume 2003). Furthermore, *S. pyrrhinus* was the most frequently sighted mammalian species at a clay lick (colpa) in terra firma forest (Hammer and Tatum-Hume 2003). Lactating females have been documented in January (Thorington et al. 2012).

Sciurus pyrrhinus occurs at higher mean abundance in locations where logging has ceased compared to locations with continued logging. At disused logging sites, this species

occurred at 120% greater relative abundance than *S. ignitus*. At active logging sites, *S. pyrrhinus* occurred at 240% greater relative abundance than *S. ignitus*, perhaps demonstrating a greater tolerance by *S. pyrrhinus* for anthropogenic habitat disturbance (Schulte-Herbrüggen and Rossiter 2003).

In lowland rain forest and terra firma high forest, *S. pyrrhinus* has been observed (Hammer and Tatum-Hume 2003; Schulte-Herbrüggen and Rossiter 2003) in association with *S. ignitus*, *S. spadiceus*, peccaries (white-lipped peccary [*Tayassu pecari*] and collared peccary [*Pecari tajacu*]), brocket deer (common brown brocket [*Mazama gouazoubira*] and common red brocket [*M. americana*]), brown agouti (*Dasyprocta punctata variegata*), nine-banded armadillo (*Dasyprocta novemcinctus*), puma (*Puma concolor*), South American coati (*Nasua nasua*), tayra (*Eira barbara*), Venezuelan red howler monkey (*Alouatta seniculus*), spider monkeys (*Ateles*), monk saki (*Pithecia monachus*), capuchins (tufted capuchin [*Cebus apella*] and white-fronted capuchin [*C. albifrons*]), brown titi (*Callicebus brunneus*), night monkeys (*Aotus*), squirrel monkeys (*Saimiri*), and brown-mantled tamarin (*Saguinus fuscicollis*). Clay licks utilized by *S. pyrrhinus* also were frequented by *S. spadiceus*, lowland paca (*Cuniculus paca*), red acouchi (*Myoprocta acouchy*), peccaries, brocket deer, and red howler monkeys (Hammer and Tatum-Hume 2003).

BEHAVIOR

Sciurus pyrrhinus is diurnal. Observations of intraspecific tolerance in foraging and playing in small groups averaging 1.6 individuals (Hammer and Tatum-Hume 2003; Thorington et al. 2012) suggest nonterritorial behavior among individuals. *S. pyrrhinus* utilizes clay licks and ingests soil; visits averaged 14 min in duration (range = 2–53 min—Hammer and Tatum-Hume 2003).

CONSERVATION

The International Union for Conservation of Nature and Natural Resources considers *Sciurus pyrrhinus* to be “Data Deficient” (Amori et al. 2008); the Peruvian government classifies the species as “Vulnerable” in Peru (under DS N° 034-2004-AG—Pacheco et al. 2009; Quintana et al. 2009). No information is available on population numbers or trends (Thorington et al. 2012), although *S. pyrrhinus* is considered to be relatively common and frequently encountered within its distribution (von Tschudi 1844; Schulte-Herbrüggen and Rossiter 2003; Aquino and Torres 2010). *S. pyrrhinus* acclimates easily to human disturbance where food is adequate, and recovers from moderate hunting (Schulte-Herbrüggen and Rossiter 2003; Aquino et al. 2010; Aquino and Torres 2010). The species has a very restricted distribution primarily in Peru, and

much of its ecology and behavior is unknown (von Tschudi 1844; Emmons and Feer 1997; Pacheco 2002; Duff and Lawson 2004; Thorington and Hoffman 2005; Pacheco et al. 2009; Thorington et al. 2012) making it a possible future conservation concern.

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