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Sciurus yucatanensis.

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Sciurus yucatanensis Allen, 1877

Yucatán Squirrel

Sciurus carolinensis var. *yucatanensis* Allen, 1877:705. Type locality "Merida, Yucatan," Mexico.

Sciurus yucatanensis: Elliot, 1896:80, elevation of subspecies to species.

CONTEXT AND CONTENT. Order Rodentia, Suborder Sciurognathi, Family Sciuridae, Subfamily Sciurinae, Genus *Sciurus*, Subgenus *Sciurus* (Wilson and Reeder, 1993). Based upon structure of the hyoid bones, *S. yucatanensis* also has been placed into the subgenus *Neosciurus* (Hoffmeister and Hoffmeister, 1991). The genus *Sciurus* contains 28 species (Wilson and Reeder, 1993). Three subspecies of *S. yucatanensis* currently are recognized (Hall, 1981), but Jones et al. (1974) believed that *S. y. baliolus* and *S. y. yucatanensis* should be combined into *S. y. yucatanensis:*

S. y. baliolus Nelson, 1901:131. Type locality "Apazote, Campeche, Mexico."

S. y. phaeopus Goodwin, 1932:1. Type locality "Secanquim, District of Alta Verapaz, Guatemala; 1600 feet elevation."

S. y. yucatanensis Allen, 1877:705, see above.

DIAGNOSIS. Throughout its range *S. yucatanensis* (Fig. 1) is sympatric with *S. deppei*; both are found in similar habitats (Musser, 1968), but *S. deppei* is much smaller (total length of *S. deppei* is 343–387 mm compared with 450–500 mm for *S. yucatanensis*—Hall, 1981). *S. yucatanensis* also is sympatric with *S. aureogaster* (Musser, 1968), but the skull of *S. yucatanensis* (Fig. 2) is <57.3 mm in length (>57.3 mm in *S. aureogaster*—Hall, 1981). The geographic ranges of *S. yucatanensis* and *S. aureogaster* overlap slightly in the lowlands of eastern Tabasco, Mexico; color and pattern of the two are different. In eastern Chiapas, Mexico, and the Alta Verapaz of Guatemala, neither *S. yucatanensis* nor *S. aureogaster* is strikingly patterned or colored. There is no evidence that the two species hybridize (Musser, 1968).

Sciurus yucatanensis, *S. colliaei*, and *S. variegatoides* are similar in color and pattern of pelage, but they differ in size. For example, the range of variation in pelage features of some populations of *S. yucatanensis* from Yucatán fall within that of populations of *S. colliaei* from northern Nayarit and Sinaloa; each species is practically indistinguishable from the others (Musser, 1968). Northern populations of *S. yucatanensis* also are essentially a smaller version of the western and southwestern populations of *S. variegatoides*. Differences in pelage features between the two are of the same magnitude as those between adjacent, slightly differentiated, and intergrading subspecies of *S. variegatoides*, but *S. yucatanensis* is smaller in cranial and external dimensions than nearby populations of *S. variegatoides*. It is possible that *S. variegatoides* and *S. yucatanensis* intergrade in northern Belize (Musser, 1968; Ruiz-Piña, 1994).

GENERAL CHARACTERS. The Yucatán squirrel is a medium-sized, dusky colored species with a relatively long tail (Goodwin, 1934), which is rather full (Nelson, 1899). The upperparts are grizzled black and gray with a suffusion of yellow to ochraceous buff. The underparts vary from dirty white through a grizzled yellowish-gray to black. Dorsally, the tail is black with a wash of white. Ventrally, the tail has a median stripe of dull-gray fulvous or black and gray bordered with black and edged with white. The ear tufts (sometimes present) are dingy white (Hall, 1981) and are more evident from November to February in northern populations and from February to April in southern populations (Ruiz-Piña, 1994).

The skull of *S. yucatanensis* (Fig. 2) is short and broad, the length of the facial portion is especially short, and the dorsal convexity of the parietal region is depressed (Allen and Chapman, 1897). Average external and cranial measurements (in mm) of *S. y. phaeopus* and *S. y. yucatanensis*, respectively, are: total length, 485, 451; length of tail, 240, 222; length of hind foot, 59, 55; length of ear from notch, 18,—; basal length of cranium, 46.0, 45.0; palatal length, 28.0, 23.0; interorbital breadth, 18.0, 16.2; zygomatic breadth, 32.0, 19.0; length of upper toothrow, 10.2, 9.5 (Goodwin, 1932; Nelson, 1899).

Compared with *S. y. baliolus* (and presumably with *S. y. yucatanensis*—Jones et al., 1974), *S. y. phaeopus* is uniformly darker, and is conspicuously different in accentuation of the darker markings. The limbs especially, are darker. The sides of the head are blacker in *S. y. phaeopus*, with conspicuous black patches at the base of the ears, which are indistinct or absent in *S. y. baliolus*, the underparts usually are more buffy and less grayish, and the tail is more extensively black than in *S. y. baliolus* (Goodwin, 1932).

DISTRIBUTION. The Yucatán squirrel occupies tropical forests of the Yucatán Peninsula, northern Guatemala, eastern Tabasco, and eastern Chiapas (Fig. 3). The known elevational range is ca. 10–480 m (Hall, 1981; Musser, 1968; Nelson, 1899; Ruiz-Piña, 1994).

FOSSIL RECORD. The genus *Sciurus* evolved by the early Miocene (Black, 1972). Remains of *S. yucatanensis* have been recovered from Pleistocene and Recent deposits in caves on the Yucatán Peninsula (Alvarez, 1982; Hatt et al., 1953).

FORM AND FUNCTION. The pelage is thin, coarse, and stiff. The dental formula is i 1/1, c 0/0, p 2/1, m 3/3, total 22 (Hall, 1981). The hyoid apparatus consists of a single basihyal and paired thyrohyals, ceratohyals, and stylohyals; the basihyal is thick, triangular in cross-section, long, and fuses with the short thyrohyals at an early age (Hoffmeister and Hoffmeister, 1991).

The baculum of *S. yucatanensis* (Fig. 4) is most like bacula of *S. aureogaster*, *S. colliaei*, and *S. variegatoides*. The basal portion of the shaft is circular or nearly so in cross section. The shaft tapers distally, with an apparent twist, to its smallest diameter. At this point the shaft usually curves dorsally and expands into a broad circular disc that is concave on the right side and convex on the left. Ventral to this expanded disc is a definite spur. In *S. yucatanensis*, the baculum has a relatively high base and a small expanded distal end. There is a trace of a supplementary spur, but

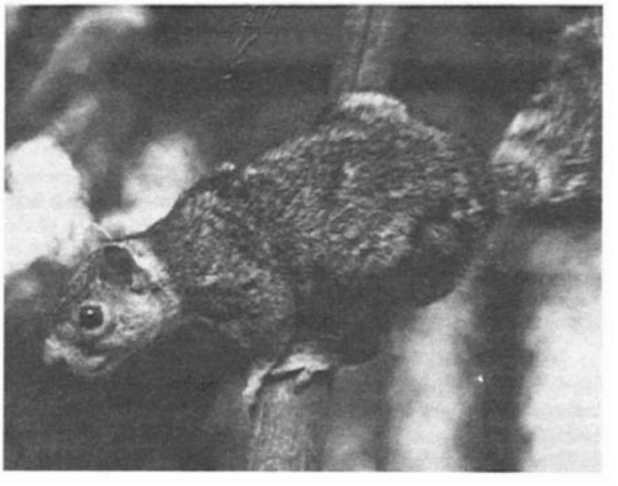

FIG. 1. *Sciurus yucatanensis* in Mérida, Yucatán, Mexico. Photograph by H. A. Ruiz-Piña.

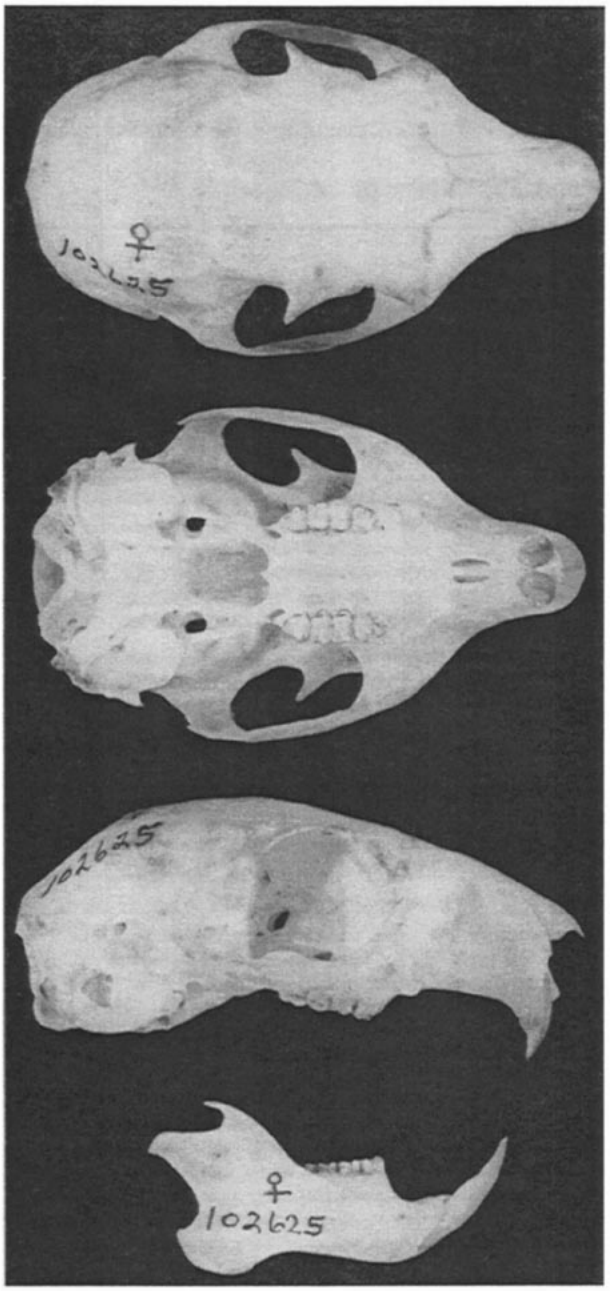

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Sciurus yucatanensis phaeopus* from 6.4 km SW Sabanadi de San Quintin, Chiapas, Mexico (female, University of Kansas Museum of Natural History 102625). Greatest length of cranium is 56.6 mm.

no indication of a tuberosity posterior to the main spur. The expanded part is deeply cupped on the right side, and the dorsal edge is bent over and is in a transverse plane relative to the vertical axis of the bone. It has a small point on its posterior edge. Measurements of bacula from Quintana Roo are: length, 10.6, 10.1, 8.9, 8.5; length of expanded tip, 2.1; height of tip, 2.7, 2.6, 2.0; height of base, 3.0; width of base, 2.1, 2.1, 2.4 (Burt, 1960; Ruiz-Piña, 1994).

ONTOGENY AND REPRODUCTION. In Yucatán, a female *S. deppei* held in captivity reportedly mated with a *S. yucatanensis*. She gave birth in February to five young, some of which resembled one parent, some the other. These offspring survived to adulthood, but whether they were fertile is not known (Gaumer, 1917; Leopold, 1959). A female *S. yucatanensis* from near Mérida, Yucatán, gave birth to three young (one male and two females) on 25 April, and an adult male from that locality was in breeding

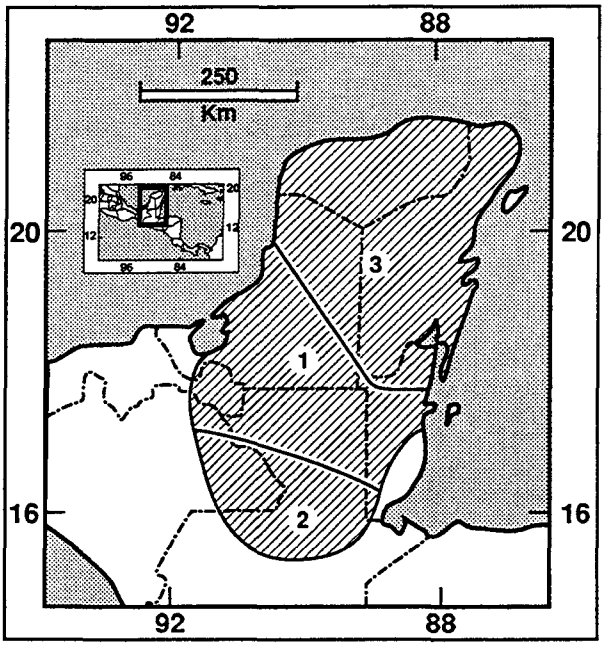

FIG. 3. Distribution of *Sciurus yucatanensis* in the Yucatán region (Hall, 1981): 1, *S. y. baliolus*; 2, *S. y. phaeopus*; 3, *S. y. yucatanensis*.

condition 1–4 May. A juvenile from near Puerto Morelos, Quintana Roo, was observed on 28 April (Birney et al., 1974).

In Campeche, two of three females from Pueblo Nuevo X-Can were pregnant on 28–29 July; one had three embryos (40 mm in crown-rump length), another had two embryos (30 mm in crown-rump length), and the third had enlarged mammae, suggesting recent lactation, as did a female from 5 km S Champotón on 10 July. A young male, in juvenile pelage, was observed on 18 July. An adult male and adult female from the southern part of Campeche were in long, fresh pelage on 28 December. The male had testes that were 24 mm in length; the female evinced no sign of reproductive activity (Jones et al., 1974).

ECOLOGY. Habitat of the Yucatán squirrel primarily is tropical broadleaf forest (either deciduous or evergreen), but it also frequents semiarid pine-oak woodlands (Musser, 1968). *S. yucatanensis* inhabits the Yucatán Peninsula biotic province, which is formed by the low, flat peninsula area that projects toward the island of Cuba from the mainland between the Gulf of Mexico and the Caribbean Sea. In this area, there are no mountains and few hills >90–150 m elevation. A comparatively thin layer of soil covers the underlying limestone, which is porous and absorbs moisture so readily that there is little surface drainage. The year is divided into the rainy season from June to about the end of November, and the dry season from December to June (Goldman, 1951). *S. y. yucatanensis* lives in a more arid region than *S. y. baliolus*, which inhabits more humid forests (Nelson, 1901). In Quintana Roo, *S. yucatanensis* feeds on fruits of *Vitex gaumeri*, *Bunchosia swartziana*, *Croton glabellus*, and *Trichilia arborea* (Ruiz-Piña, pers. observ.).

The geographic ranges of *S. yucatanensis* and *S. aureogaster* overlap slightly in the lowlands of eastern Tabasco. The ecological relationship between these species is unclear. In eastern Chiapas and Alta Verapaz of Guatemala, *S. yucatanensis* occupies the lowlands, and *S. aureogaster* occurs in the highlands. There, too, habitat relations between the two are obscure (Musser, 1968). In Parque Nacional Tikal, Guatemala, *S. yucatanensis* occurs with *Alouatta villosa*, *Ateles geoffroyi*, *Sciurus deppei*, *Dasyprocta punctata*, *Nasua nasua*, *Potos flavus*, *Eira barbara*, *Tayassu tajacu*, *Mazama americana*, and *Odocoileus virginianus* (Cant, 1977).

Ectoparasites include the chiggers *Eutrombicula alfreddugesi* and *Hoffmannina suriana* (Loomis, 1969) and the louse *Enderleinellus hondurensis* (Kim, 1966). One tapeworm was present in the stomach of a specimen obtained in Quintana Roo (Ruiz-Piña, pers. observ.).

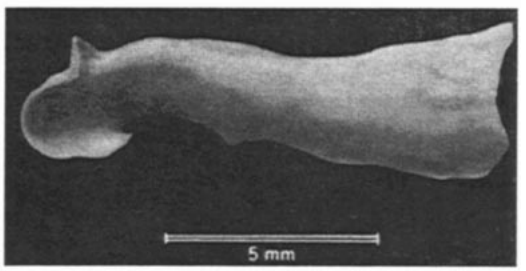

FIG. 4. Baculum of *Sciurus yucatanensis* from Esmeralda, Quintana Roo, Mexico (modified from Burt, 1960).

The Yucatán squirrel seems to be common in some areas and rare in others (Goodwin, 1934; Jones et al., 1974). At Chichen Itza, Yucatán, Mexico, the species was common in 1896, few remained by 1929 (Hatt, 1938), and now it seems common there (M. D. Engstrom, in litt.). In Guatemala, *S. yucatanensis* has been numerous enough at times to damage green corn (Goodwin, 1934).

BEHAVIOR. The Yucatán squirrel is timid (Cant, 1977) and retreats into the forest soon after daybreak (Goodwin, 1934), but it has been observed in pastures (Murie, 1935). One afternoon, a *S. yucatanensis* was observed lying stretched out asleep in a small tree. Its nest of twigs and leaves in a fork of the tree top was nearby; the squirrel evidently had left the nest to avoid the heat (Musser, 1968). Nothing is known concerning the genetics of *S. yucatanensis*.

REMARKS. *Sciurus yucatanensis*, *S. colliaei*, and *S. variegatoides* may be fragmented segments of one species whose geographic range once extended along the Pacific lowlands and uplands from Sonora to southern Guatemala, across eastern Guatemala into the Yucatán Peninsula, and throughout Central America to Panama. Geographic distributions of segments now represented by *S. yucatanensis* and *S. variegatoides* remain relatively intact and the two may still connect (geographically and genetically) through eastern Guatemala and northwestern Honduras. The Pacific segment in Mexico, however, was fragmented and the northwestern populations now represented by *S. colliaei* are at present separated from the southeastern populations (*S. variegatoides*) by a different but closely related species, *S. aureogaster*. Pelage features and known ecology of *S. yucatanensis*, *S. colliaei*, and *S. variegatoides* are in harmony with this hypothesis. So too is the geographic distribution of external and cranial dimensions of the three forms. Although the three differ in these features, the extremes are encompassed in *S. colliaei*, which grades clinally from a small squirrel about the size of *S. yucatanensis* to one larger than *S. variegatoides*. The original, continuously distributed species may have been as variable in external and cranial dimensions (Musser, 1968). Recent analyses of crania and coloration have indicated that *S. yucatanensis* may represent two species, *S. yucatanensis* and *S. baliolus* (including *S. y. baliolus* and *S. y. phaeopus*—Ruiz-Piña, 1994).

Sciurus is from the Latin meaning squirrel (Jaeger, 1955). The specific epithet *yucatanensis* refers to the Yucatán Peninsula. *S. yucatanensis* also has been referred to as the Campeche (Nelson, 1901), Swarthy (Elliot, 1904), banded-back (Elliot, 1907), and black-footed squirrel (Goodwin, 1934).

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