

*Sigmodon leucotis*. By Karl A. Shump, Jr., and Rollin H. Baker

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*Sigmodon leucotis* Bailey, 1902

White-eared Cotton Rat

*Sigmodon leucotis* Bailey, 1902:115. Type locality Valparaiso Mountains, 2653 m, Zacatecas.

*Sigmodon alticola* Bailey, 1902:116. Type locality Cerro San Felipe, 3050 m, Oaxaca.

**CONTEXT AND CONTENT.** Order Rodentia, Suborder Myomorpha, Family Muridae, Subfamily Cricetinae. The genus *Sigmodon* now includes at least seven species. A key to them is presented in Baker and Shump (1977). Two subspecies of *Sigmodon leucotis* are recognized (Baker, 1969) as follows:

*S. l. leucotis* Bailey, 1902:115, see above.

*S. l. alticola* Bailey, 1902:116, see above.

**DIAGNOSIS.** Conspicuous whitish ears on a brownish-gray head and body coupled with small to medium size (for captive animals, maximum weights are 140 g for nonpregnant females and 131 g for males; maximum lengths of head and body are 169 mm and 160 mm, respectively), prominent premaxillary depressions on each side of the rostrum, and absent or exceedingly reduced lingual roots on the first lower molars distinguish *S. leucotis* from other members of the *S. fulviventris* group (that is, *S. fulviventris*, *S. alleni*, and *S. ochrognathus*). Distinguishing cranial characters are: interparietal short, length at midline < 2 mm; anterior portion of mesopterygoid fossa parallel-sided; and angular process of mandible slightly hooked rather than rounded (Baker, 1969).

*Sigmodon leucotis* differs from the *S. hispidus* group (*S. hispidus*, *S. arizonae*, and *S. mascotensis*) by possessing small tail scales, 0.50 mm wide as opposed to 0.75 mm wide; tail heavily haired instead of sparsely haired; skull short rather than long; palatal pits deep not shallow; and median keel on palate prominent rather than slight (Baker, 1969; Zimmerman, 1970).

**GENERAL CHARACTERS.** No differences in size between sexes were found in the white-eared cotton rat (Baker, 1969; Jiménez, 1971, 1972), and the subsequent measurements (in mm, N = 10, from Baker, 1969) are for combined sexes of wild-taken adults from Durango. External measurements are: length of head and body, 143 (132 to 157); hind foot, 28 (26 to 31); height of ear from notch, 21 (19 to 23). Cranial measurements are: condylopremaxillary length, 32.5 (31.4 to 34.1); zygomatic breadth, 20.1 (19.7 to 20.6); least interorbital constriction, 5.1 (4.7 to 5.3); depth of cranium, 11.2 (10.9 to 12.0); length of nasals, 11.8 (11.1 to 12.9); alveolar length of maxillary toothrow, 6.4 (6.1 to 6.8). Dental characters which distinguish *Sigmodon* from other rodents (Hershkovitz, 1955) are summarized in Baker and Shump (1977). The skull of *S. leucotis* is illustrated in Figure 1.

**DISTRIBUTION.** The white-eared cotton rat occupies montane habitats from approximately 25° N latitude in the Sierra Madre Occidental (in the west) and the Sierra Madre Oriental (in the east) southeastward into the central part of the Trans-Mexican Volcanic Belt and ending in the Sierra Madre del Sur in Oaxaca (Davis, 1944; Hall and Kelson, 1959; Baker and Greer, 1962; Webb and Baker, 1962; Baker, 1969; Goodwin, 1969; Anderson, 1972). Figure 2 shows the range of *S. leucotis*.

**FOSSIL RECORD.** *Sigmodon leucotis* lacks a fossil record. Pertinent information for the genus is given in Baker and Shump (1977).

**FORM.** The hair of the pelage of *Sigmodon leucotis* is of three types, excluding vibrissae (Baker and Shump, 1977). The dorsum is brownish gray; venter grayish white; feet brownish gray; and tail blackish brown (Bailey, 1902; Baker, 1969; Anderson, 1972). The pinnae are partially covered by fur.

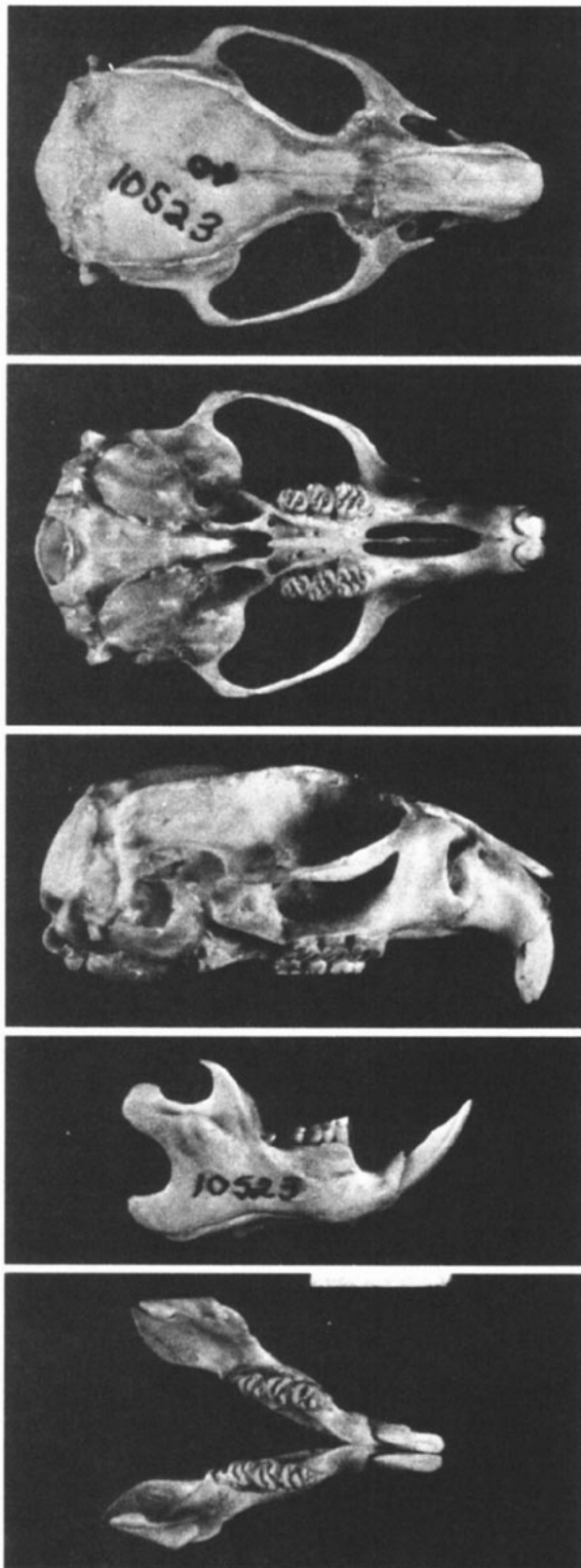


FIGURE 1. Dorsal, ventral, and lateral views of cranium, and lateral and occlusal views of mandible of *Sigmodon leucotis* (MSU 10523, male from Hacienda Coyotes, 2707 m, Durango, México). Scale represents 10 mm.

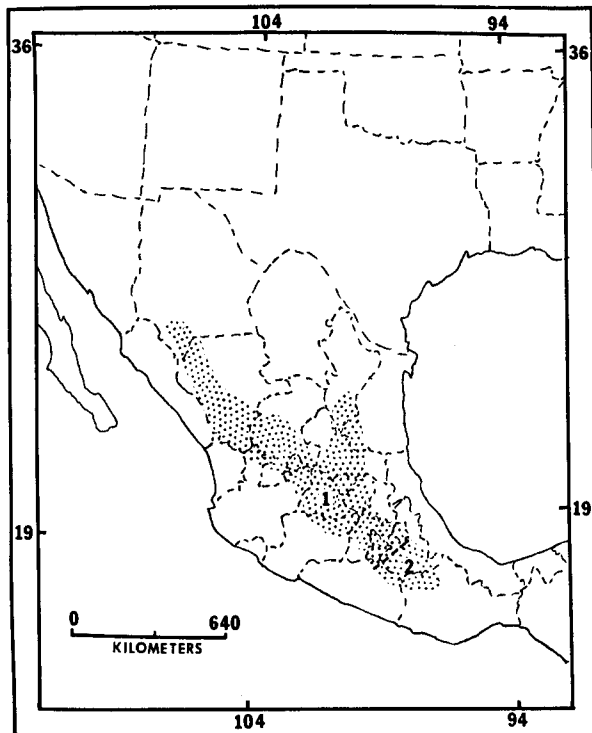


FIGURE 2. Distribution of white-eared cotton rats: 1) *S. l. leucotis*; and 2) *S. l. alticola*.

**FUNCTION.** The metabolism of *S. leucotis* has been measured for a population from Durango, Mexico (Bowers, 1971). The mean value of oxygen consumption was found to be 1450 mm<sup>3</sup> O<sub>2</sub>/g/hr.

**ONTOGENY AND REPRODUCTION.** Growth curves for *Sigmodon leucotis* are presented in Baker and Shump, 1977. No sexual dimorphism in size was found. The gestation period for this species is about 35 days (Baker, 1969).

**ECOLOGY.** *Sigmodon leucotis* is associated chiefly with mesic pine-oak habitat and is strictly a montane species. In such areas the species seems best adapted to mixed grass and shrub cover on shallow, rocky soils, even though animals also have been caught in grassy meadows. Vegetation associated with the white-eared cotton rat includes: *Ceanothus fendleri*, *Senecio actinella*, *Senecio pinnatisectus*, *Taraxacum officinale*, *Stipa* sp., *Muhlenbergia* sp., *Ranunculus* sp., *Quercus* sp., *Geranium* sp., *Cosmos* sp., *Valeriana* sp., *Castilleja* sp., *Achaetogeron* sp., *Lupinus* sp., *Tradescantia* sp., and *Arctostaphylos* sp., (Webb and Baker, 1962; Baker, 1969).

The white-eared cotton rat is known to construct nests, burrows, and runways. However, in areas of sparse vegetation with low shrubs for cover, runway systems are obscure or absent. In fact, little or no sign of this species may be present, making its presence difficult to detect.

*Sigmodon leucotis* has not been captured in areas with *S. alleni*, *S. ochrognathus*, or *S. hispidus*. Nevertheless, *S. leucotis* has been taken in a mixed boreal-tropical habitat near Pueblo Nuevo in Durango, which is similar to some of the places in Michoacán and Oaxaca where *S. alleni* occurs. In the mountains of west-central Durango, *S. leucotis* and *S. ochrognathus* are found at the same latitude but at different elevations, with the former occurring in more mesic areas (Baker, 1969).

In the vicinity of Hacienda Coyotes, Durango, and at 8 km SW Ibarra, Guanajuato, Baker (1969) found *S. leucotis* and *S. fulviventer* in the same areas. At both of these places, *S. leucotis* occupied the rocky, brushy, well-drained slopes, whereas *S. fulviventer* dominated the open grasslands. In comparable situations at San Luis and at the Rancho Las Margaritas in Durango, *S.*

*fulviventer* was absent and *S. leucotis* occurred in both habitats. Even when *S. fulviventer* is absent, *S. leucotis* has not been commonly found in some suitable habitats if other grass eaters are present, such as *Microtus mexicanus* and *Neotomodon alstoni* (Davis and Follansbee, 1945).

*Sigmodon leucotis* is parasitized by the flea, *Polygenis martinez-baezi* Vargas, 1951, and chiggers *Hyponeocula argenicola* and *Fonseca* sp. These parasites were obtained from specimens taken near Hacienda Coyotes, Durango (Baker, 1969).

**GENETICS.** The sex chromosomes are both acrocentric with sex determination being XX/XY. The diploid chromosomal number of *S. leucotis* is 52 with a FN of 52 (Zimmerman, 1970). This chromosomal number was based on two specimens from Durango and one specimen from Zacatecas.

**REMARKS.** The exact phylogenetic relationship of *S. leucotis* to other species of the genus is still nebulous. Serological evidence (Dalby and Lillevik, 1969) coupled with morphological considerations (Baker, 1969) show the white-eared cotton rat to be closely related to *S. fulviventer*. However, a karyological investigation (Zimmerman, 1970) indicated this species to be most closely related to *S. hispidus* and distantly related to *S. fulviventer*.

A laboratory colony maintained in the Division of Living Vertebrates of The Museum at Michigan State University thrived but produced few litters in captivity.

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