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J. Knox Jones Jr.
Texas Tech University, Lubbock, TX

Hugh H. Genoways
University of Nebraska-Lincoln, h.h.genoways@gmail.com

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Neotoma phenax.

By J. Knox Jones, Jr., and Hugh H. Genoways

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Neotoma phenax (Merriam, 1903)

Sonoran Woodrat

Teanopus phenax Merriam, 1903:81. Type locality Camoa, Sonora.

[*Neotoma*] *phenax*, Burt and Barkalow, 1942:289.

CONTEXT AND CONTENT. Order Rodentia, Family Cricetidae, Subfamily Cricetinae. *N. phenax* is monotypic and the sole representative of the subgenus *Teanopus*.

DIAGNOSIS. The Sonoran woodrat is a medium-sized member of the genus with notably large ears. The skull generally resembles that of other species of *Neotoma* excepting that the bullae are enormously inflated, blunt anteriorly, and nearly parallel (see figure 1). The antorbital slits are large and the sphenoid vacuities open.

GENERAL CHARACTERS. Birney and Jones (1972:207) found that males examined by them averaged slightly larger than did females, "but secondary sexual differences are slight and not readily apparent in comparisons of individuals." Color of upper parts varies from brownish to buffy-gray, depending on age and season; underparts are grayish-white, sometimes tinged lightly with buff; the tail is fully haired, dark brownish above, slightly paler below. There is a dusky wash on the top of the feet that extends to the base of the toes (and sometimes onto them), which are much paler in color. On most museum specimens, the head is distinctly grayish in comparison with more posterior parts of the dorsum. See also Merriam (1903:81) and Hall and Kelson (1959:706).

Extremes in external and cranial measurements in millimeters of adults (both sexes) as reported by Birney and Jones (1972:208–209) are as follows: total length, 330 to 431; length of tail, 149 to 220; length of hind foot, 32 to 40; length of ear, 28 to 35; greatest length of skull, 42.7 to 47.0; condylobasal length, 41.1 to 46.3; zygomatic breadth, 21.0 to 24.0; mastoid breadth, 17.8 to 20.4; length of rostrum, 15.0 to 17.7; depth of cranium, 16.0 to 18.2; interorbital constriction, 5.1 to 6.9; breadth of rostrum, 6.4 to 7.6; length of maxillary toothrow, 7.7 to 9.0; length of palatal bridge, 6.5 to 8.8.

Weights in grams of 10 adult males and 10 adult (nonpregnant) females, selected at random from the collection at the Museum of Natural History, University of Kansas, averaged 239 (196–279) and 216 (188–248), respectively.

DISTRIBUTION. Known only from coastal lowlands in northwestern México (figure 2) from southern Sonora (vicinity of Guaymas) southward to central Sinaloa (vicinity of El Dorado). Known altitudinal distribution is from sea level to at least 500 ft (150 m). Known records of occurrence for *N. phenax* were summarized by Birney and Jones (1972:204). No fossils are known of this species.

FORM. The baculum of this woodrat has been figured by Burt and Barkalow (1942:293), Hoffmeister and de la Torre (1959:172), Burt (1960:pl.23), and Hooper (1960:pl.4), and is smaller than in any other species of *Neotoma*. The bony portion is dorsoventrally flattened and has no distinct shaft; it resembles a violin in outline. A cartilaginous cone, about half the length of the bone, continues distally and is tipped with an attenuate process of softer tissue. Bacular measurements given by Burt (1960:62) were length 3.6 mm, width of base 1.5.

Hooper (1960:8, pl. 4), described and figured the glans penis of *N. phenax* in some detail. According to Hooper (*op. cit.*:19), the phalli of *N. phenax* and *N. stephensi* form one subgroup within *Neotoma*: "The phalli of those two species are readily distinguishable, but they are constructed according to the same plan and proportions. Through *mexicana* they connect with the *albigula* subgroup, the resemblance being particularly evident in the shape of the baculum and of the distal part of the glans."

ONTOGENY AND REPRODUCTION. There are no data on growth and development in *N. phenax*. Birney and Jones (1972) reported a pregnant female taken in January and another in December, and Burt (1938:62) recorded one obtained in February; all carried two fetuses. An April-taken female in the collection of The Museum of Texas Tech University was both lactating and pregnant with three fetuses. Lactating females were recorded by Birney and Jones from February, March, April, August, and November; in all lactating females with young attached to the mammae, the number was two, but several lactating females were nesting with a single, unattached juvenile. The modal litter size was two.

Birney and Jones (1972) listed testicular length of two males taken in March as 12 and 13 mm, 12 for one from August, and 8, 12, and 13 for three collected in December. They concluded from the meager information available and from the age composition of their sample that there was no clear evidence of seasonality in breeding of *N. phenax*. "However, the data suggest re-

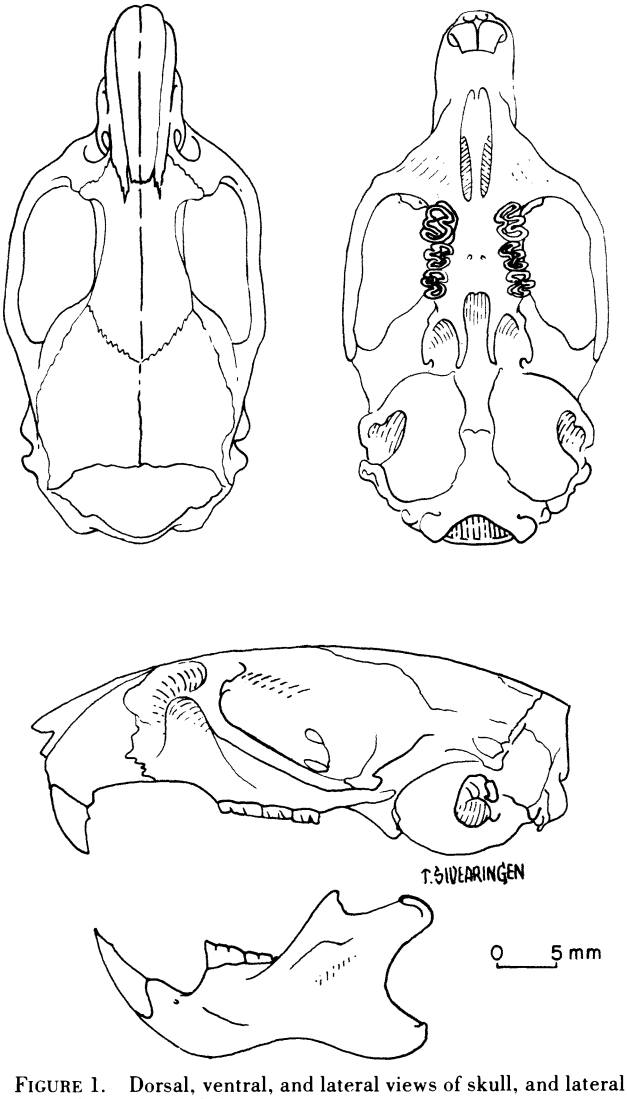

FIGURE 1. Dorsal, ventral, and lateral views of skull, and lateral view of lower jaw of *N. phenax*.

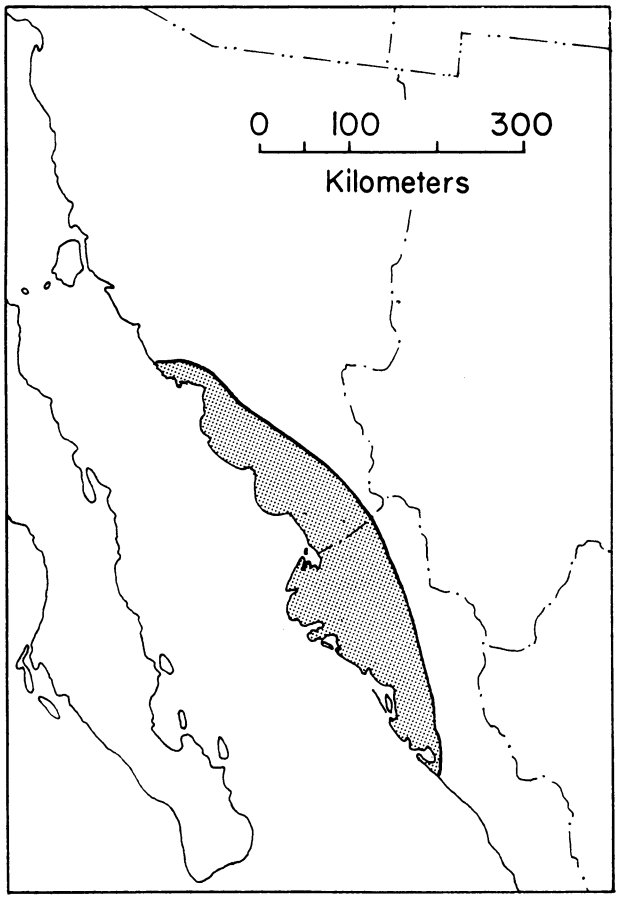

FIGURE 2. Geographic distribution of *N. phenax* in southern Sonora and northern Sinaloa, western México.

FIGURE 3. Nest of a Sonoran woodrat in cactus. Photograph by R. J. Baker.

duced breeding activity in late November and December and again in late spring. Adult females apparently have at least two and probably several litters per year. Additionally, most young females that had attained adult size and pelage were reproductively active, although some still had re-entrant angles of the molars extending to or near the alveolus."

ECOLOGY. Relatively little is known of the ecology of the Sonoran woodrat. In southern Sonora, Burt (1938:62) noted that nests of this species usually were found along streams in thick brush or low trees. In Sinaloa, this rat occurs typically in tropical thorn woodland.

Birney and Jones (1972:206) reported individuals living in holes near a dry, sandy creek bed at one place in Sinaloa. Some holes had no sign of sticks and thorny branches that usually characterize the nests of this species but other holes had such materials stored in them. At all other places where these woodrats were obtained in Sinaloa, nests were constructed of thorny vegetation. Frequently, they were built on branches of large thorn trees from 1.5 to 6 m above the ground. At one locality, Birney and Jones (*loc. cit.*) reported many nests in a narrow belt of thorn trees, about equal numbers in the trees and under thorny vegetation on the ground. They also noted that several species of cactus were associated with rat houses and that occasionally nests were supported above the ground in cactus plants (see figure 3).

Burt (*loc. cit.*) thought persimmons an important dietary item because Sonoran woodrats often were seen at night in persimmon trees. All above-ground nests for which Birney and Jones (*loc. cit.*) had data contained caches of leaves and native fruits. They also reported that rats were not readily attracted to traps baited with rolled oats, "but were easily captured or shot when houses were dismantled."

Ectoparasites recorded from *N. phenax* include a louse, *Neohaematopinus* sp. (Emerson, 1971:376), and three species of chiggers, *Eutrombicula alfreddugesi*, *Hexidionis allredi*, and *Leptotrombidium panamense* (R. B. Loomis, personal correspondence). Also, several species of *Triatoma* (kissing bugs), blood-sucking ectoparasites of the hemipteran family Reduviidae, are known from nests of the Sonoran woodrat (see especially Ryckman and Ryckman, 1967), and a reservoir-host relationship evidently exists between the rat and these insects.

GENETICS. *Neotoma phenax* has a distinctive karyotype among species of the genus (Baker and Mascarello, 1969:193), consisting of a diploid number of 38 and a fundamental number of 50. The autosomal complement consists of six pairs of large to medium-sized submetacentrics, one pair of medium-sized subtelocentrics, and 11 pairs of acrocentrics that are large to medium in size. The X and Y are large submetacentrics, larger than any of the autosomes (see figure 4). The C-banding and G-banding patterns of the chromosomes were described by Mascarello *et al.* (1974).

No other species of woodrat for which the karyotype is known has a diploid number fewer than 52 according to Baker and Mascarello (1969) and Mascarello *et al.* (1974).

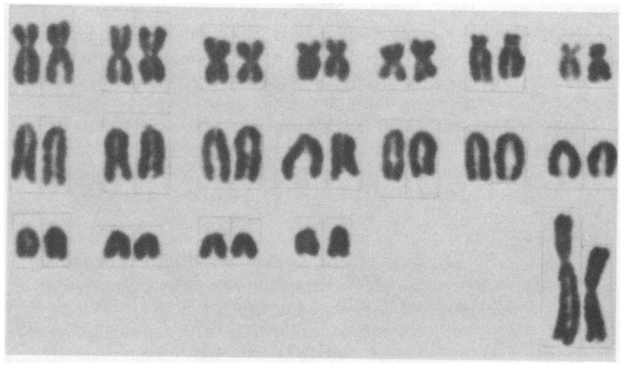

FIGURE 4. Karyotype of male *N. phenax* (courtesy R. J. Baker).

REMARKS. *Neotoma phenax* originally was designated as the type species of the monotypic genus *Teanopus* by Merriam (1903:81). Burt and Barkalow (1942:296) reduced *Teanopus* to subgeneric rank under *Neotoma*.

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Principal editor of this account was S. ANDERSON.

J. K. JONES, JR., AND H. H. GENOWAYS, THE MUSEUM AND DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY, LUBBOCK 79409, AND CARNEGIE MUSEUM OF NATURAL HISTORY, 4400 FORBES AVENUE, PITTSBURGH, PENNSYLVANIA 15213.