MAMMALIAN SPECIES No. 709, pp. 1–3, 3 figs.

Peromyscus hooperi.

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Published 26 December 2002 by the American Society of Mammalogists

Peromyscus hooperi Lee and Schmidly, 1977

Hooper's Deer Mouse

Peromyscus hooperi Lee and Schmidly, 1977:263. Type locality "2.5 mi W, 21 mi S Ocampo, 3,500 ± ft, Coahuila, México."

CONTEXT AND CONTENT. Order Rodentia, suborder Sciurognathi, family Muridae, subfamily Sigmodontinae, genus *Peromyscus* (Musser and Carleton 1993), subgenus *Peromyscus*. *P. hooperi* is monotypic (Lee and Schmidly 1977).

DIAGNOSIS. *Peromyscus hooperi* (Fig. 1) differs from *P. merriami* in having a greater total length and longer tail, skull, nasals, and rostrum. Auditory bullae are more inflated. In comparison with *P. eremicus*, *P. hooperi* has a greater total length and has a longer skull and nasal bones. Posterior end of nasal bone is tapered in a V-shaped pattern but is truncate in *P. eremicus*. Hyoid is similar to that of *P. eremicus*, but entoglossal process of basihyal is slightly more prominent and trochanter is better developed. Palatine spur of *P. hooperi* does not have the short bony protuberance of *P. eremicus*. Upper parts of *P. hooperi* are grayish rather than ochraceous or buff as in *P. merriami* and *P. eremicus*. Karyotype of *P. hooperi* is 2n = 48, FN = 52 compared to 2n = 48, FN = 92 of *P. merriami* and *P. eremicus* (Lee and Schmidly 1977; Schmidly et al. 1985).

Cranial measurements of *P. hooperi* are greater than those of *P. maniculatus*, *P. melanophrys*, and *P. pectoralis*, except for lengths of rostrum and incisive foramen. *P. hooperi* has a lower frequency of mesolophs (which if present, never extend to more than one-quarter between tooth and its labial edge) and never has an anteroloph (Schmidly et al. 1985).

Peromyscus maniculatus has a notably shorter tail, substantially smaller skull, and more complex occlusal surface of molar teeth than *P. hooperi*. Compared with *P. eremicus* and *P. leucopus*, preputial glands of *P. hooperi* are absent (macroscopically), and bulbourethrals are much larger and shaped like the head of a golf club. Vesiculars of *P. hooperi* are relatively smaller but extend more laterally from urethra and have a relatively larger subterminal flexure. Anterior prostate is somewhat smaller, and dorsal prostate is larger and with a medial lobe visible in ventral view. Testes are relatively large (Linzey and Layne 1969; Schmidly et al. 1985).

GENERAL CHARACTERS. *Peromyscus hooperi* exhibits characteristics of both the subgenera *Haplomylomys* (reduction in, or lack of, styles and lophs; proportions of glands) and *Peromyscus* (protractile tip, proportions of baculum, absence of preputial glands, 1 pair of pectoral and 2 pairs of inguinal mammae—Schmidly et al. 1985).

Peromyscus hooperi is of medium size for the genus. Tail is long and bicolored, with short hair throughout its length, light grayish brown above and whitish below. Upper parts, including face and top of head, are grayish with faint to moderate wash of brown. Lateral line is faint and near light buff or pale ochraceous buff to near ochraceous buff, and underparts are pale cream. Hind feet and lower legs are whitish.

Females are significantly larger than males in basilar length, mastoid width, and breath of auditory bullae. They also tend to be larger than males for 13 other cranial measurements (Schmidly et al. 1985). Premaxilla extends posteriorly slightly beyond nasals, auditory bullae is large, and mesolophs are absent from first 2 upper and lower molars (Fig. 2). Premaxillae extend posteriorly slightly beyond nasals, with large auditory bullae. Molars lack mesolophs and mesolphids.

Average measurements (in mm) with parenthetical ranges for 59 specimens (males and females combined) from Coahuila (Schmidly et al. 1985) are: total length, 201.8 (172–218); length of tail, 110.3 (92–132); length of hind foot, 21.3 (19–23); length of ear from notch, 19.2 (17–22); greatest length of skull, 26.4 (25.7–27.5); zygomatic breadth, 13.1 (11.6–13.7); length of nasal, 9.9 (9.2–10.6); length of rostrum 9.9 (9.2–10.5); length of bony palate, 3.9 (3.6–4.2); width of mastoid, 11.7 (11.3–13.1); depth of skull, 9.1 (8.6–9.9); length of maxillary toothrow, 3.9 (3.7–4.1). Body mass is 22.0 g (range, 19.5–23.5).

DISTRIBUTION. *Peromyscus hooperi* is known only from the state of Coahuila and N of Zacatecas and San Luis Potosí, México (Fig. 3) and occurs between 1,000 and 2,000 m (Alvarez and Alvarez-Castañeda 1991; Lee and Schmidly 1977; Matson and Baker 1986; Schmidly et al. 1985). No fossils of *P. hooperi* are known.

FORM AND FUNCTION. Penis glands are small but relatively wide, and penis has a long protractile tip. Baculum is long and slender (Lee and Schmidly 1977). For male reproductive organs, average (sample size and variance not given) length and width (length alone of urethra) measurements (respectively, in mm) are: testes, 11.7, 7.4; ampullary gland, 2.4, 2.4; vesicular gland, 7.9, 2.8; anterior prostate gland, 3.2, 1.9; dorsal prostate gland, 4.5, 2.0; ventral prostate gland, 4.8, 2.8; bulbourethral gland, 3.3, 4.0; urethra, 19.5 (Schmidly et al. 1985). Dental formula is i 1/1, c 0/0, p 0/0, m 3/3.

ONTOGENY AND REPRODUCTION. Litter size of Hooper's deer mice born in captivity from June to December averaged 2.9 (n = 30). Sex ratio at birth in captivity was 1 male : 1.3 females and for wild-caught litter (n = 145), 1 male : 0.8 female. In captivity, average gestation period while lactating is 33.5 days (range, 30–40 days). Average age at first estrus is 69 days (Schmidly et al. 1985).

Newborns are slightly pigmented except on venter, legs, elbows, thighs, ankles, and feet. By day 2, young begin to grip teats more strongly and faint hairs appear on head and dorsum. Between days 3 and 4, dorsal pigmentation is darker, epidermal scales are evident, and pinnae become erect. On day 5, feeble locomotory capacity develops. On day 7, lower incisors have erupted and ventral hairs are visible. On day 9, upper incisors have erupted. After day 13, eyes have opened and external auditory meatus is patent. Postjuvenile molt occurs between 35 and 40 days of age. Dorsal post-subadult molt occurs between 10 and 20 weeks of age and lasts 5 weeks. The winter coat, which is typically gray, occurs before December and the brownish summer molt occurs between March and May (Schmidly et al. 1985).

FIG. 1. Drawing of *Peromyscus hooperi* adult male (Centro de Investigaciones Biológicas del Noroeste, number 4482).

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Peromyscus hooperi* (adult male, Centro de Investigaciones Biológicas del Noroeste, number 4480). Greatest length of cranium is 24.43 mm. Photograph by S. Rosas.

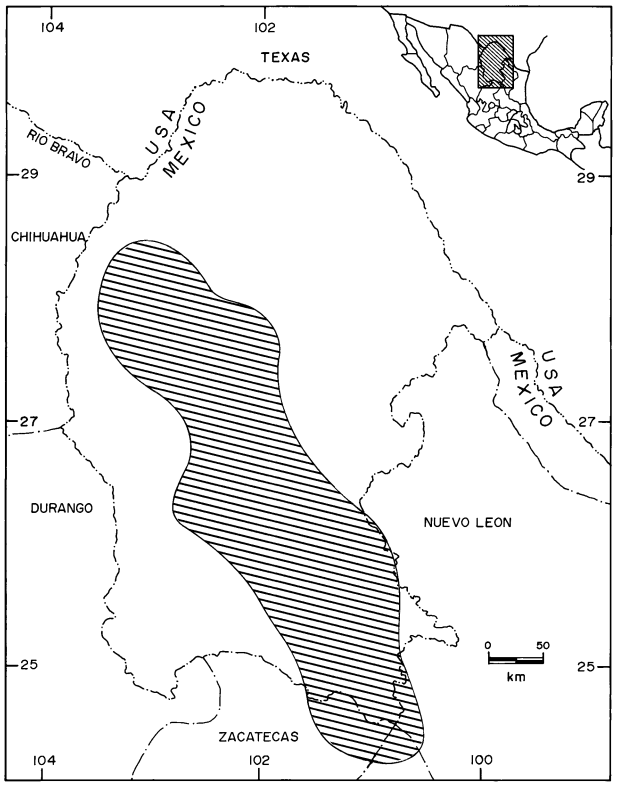

FIG. 3. Distribution of *Peromyscus hooperi* in Coahuila, Zacatecas, and San Luis Potosí, México. Modified from Schmidly et al. (1985).

ECOLOGY. Optimal habitat for *P. hooperi* is the grassland transition floral zone (Schmidly et al. 1985). This vegetation type separates the Chihuahuan desert scrub below and Montane Chaparral above. Conspicuous plants are *Dasylirion*, *Nolina*, and *Yucca*, interspersed with various grasses (Lee and Schmidly 1977). *P. hooperi* occurs in different habitats in Coahuila and N of Zacatecas—a mixture of desert scrub and grassland transition vegetation that is dominated by *Bouteloua*, *Dasylirion*, *Nolina*, and *Yucca carnerosana* (Schmidly et al. 1985). Trapping success was better on the slopes than in the arroyo, and a greater number of specimens were collected in the grassland transition vegetation (dominated by *Acacia constricta*, *Agave scabra*, *Aristida*, *Berberis*, *Ephedra*, *Euphorbia antisyphilitica*, *Forestiera*, *Hectia*, *Parthenium incanum*, and *Rhus varians*).

From San Luis Potosí, *P. hooperi* was collected in habitats with *Acacia*, *Agave striata*, *Dasylirion*, *Hechtia glomerata*, *Lechuguilla*, *Opuntia*, *Senecio*, and *Yucca* (Alvarez and Alvarez-Castañeda 1991). Hooper's deer mouse was neither found at lower elevations on the rocky hills nor on the desert plain of the Chihuahua desert scrub (Schmidly et al. 1985).

Peromyscus hooperi can occur sympatrically with *P. eremicus*, *P. melanophrys*, and *P. pectoralis* in the states of Coahuila and Zacatecas (Schmidly et al. 1985). In San Luis Potosí, where *P. hooperi* was trapped, the more abundant species were *Peromyscus melanophrys* (30.4%), *P. eremicus* (18.3%), *Reithrodontomys fulvescens* (15.4%), and *P. pectoralis* (13.3%—Alvarez and Alvarez-Castañeda 1991). *P. hooperi* may occupy a restricted habitat (Lee and Schmidly 1977).

Hooper's deer mouse is considered rare but is not afforded any protection by the Mexican Government (Norma Oficial Mexicana 2000).

GENETICS. Karyotype of Hooper's deer mouse (2n = 48, FN = 52) comprises 3 pairs of biarmed autosomes and 20 pairs of acrocentric autosomes. The autosomal component of this karyotype has been postulated as the ancestral one for the genus *Peromyscus* (Lee and Elder 1977). The X chromosome is a large subtelocentric and the Y chromosome is a small metacentric (Lee and Schmidly 1977; Schmidly et al. 1985). All autosomes and the X chromosome bear centromeric heterochromatin. One arm of the Y is heterochromatic, as identified by G-bands. Three nucleolus organizers are located near telomeres of short arms on pairs 1, 22, and 23 (Schmidly et al. 1985).

Protein of *P. hooperi* has variation in ALB-1 and TRF-1. Genetic variation is relatively low, with heterozygosity values from 0.015 to 0.049 ($\bar{X}$ = 0.028) and polymorphism from 0.056 to 0.111 (P = 0.074).

REMARKS. *Peromyscus* is from the Greek—*pera* for small or small bag, *mys* for mouse, and *iskos* is a diminutive suffix—for smaller mice (Alvarez-Castañeda and Alvarez Solórzano 1997), and *hooperi* is in honor of Emmet T. Hooper (Lee and Schmidly 1977).

The affinity of *P. hooperi* is problematic (Carleton 1989). Hooper's deer mouse was not originally included in any subgenus (Lee and Schmidly 1977) but was later assigned to the subgenus *Haplomylomys* (Bradley and Schmidly 1987). The unique anatomy of the phallus does not support this relationship and indicates a connection with the subgenus *Peromyscus* (Schmidly et al. 1985). *P. hooperi* may bridge the gap between the subgenera *Haplomylomys* and *Peromyscus* (Fuller et al. 1984; Schmidly et al. 1985). Allelic comparisons suggest that *P. hooperi* has genic identities with the subgenera *Haplomylomys* (0.629), *Megadontomys*

(0.630), *Osgoodomys* (0.625), and *Peromyscus* (0.577) and could be considered as a sole member of a new species group (Schmidly et al. 1985). However, *P. hooperi* may be phylogenetically allied with *P.* (*Peromyscus*) *boylii* (Smith 1986).

I thank Patricia Cortés-Calva and 2 anonymous reviewers for reviewing early drafts. Financial support was provided by the Consejo Nacional de Ciencia y Tecnología (CONACyT J28319N).

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Associate editors of this account were Elaine Anderson and Lui Marinelli. Editor was Virginia Hayssen.

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