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Chaetodipus eremicus.

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Chaetodipus eremicus (Mearns, 1898)

Chihuahuan Desert Pocket Mouse

Perognathus (*Chaetodipus*) *eremicus* Mearns, 1898:300. Type locality "Fort Hancock, El Paso Co. [now Hudspeth Co.], Texas."

Perognathus penicillatus eremicus: Osgood, 1900:48. Name combination.

Chaetodipus eremicus: Lee et al., 1996. First use of current name combination.

CONTEXT AND CONTENT. Order Rodentia, suborder Sciurognathi, superfamily Geomyoidea, family Heteromyidae, subfamily Perognathinae, genus *Chaetodipus*, subgenus *Chaetodipus* (Williams 1993). Two subspecies of *C. eremicus* are recognized (Hoffmeister and Lee et al. 1967; Lee et al. 1996):

C. e. eremicus (Mearns, 1898:300), see above.

C. e. atrodorsalis (Dalquest 1951:362). Type locality "7 km W Presa de Guadalupe, San Luis Potosí."

DIAGNOSIS. *Chaetodipus eremicus* (Fig. 1) is generally smaller than *C. nelsoni* and closer in size to *C. intermedius*, but *C. eremicus* lacks rump spines. *C. eremicus* does have thin, elongate rump hairs, absent in both *C. nelsoni* and *C. intermedius* (Davis and Schmidly 1994; Wilkins and Schmidly 1979). Overall length of *C. eremicus* is usually <180 mm (Wilkins and Schmidly 1979; Yancey 1997), compared with >180 mm total length for *C. nelsoni* (Davis and Schmidly 1994). Sole of hind foot is pale pink or white and naked to heel, distinguishing *C. eremicus* from *C. intermedius*, which has a dusky-colored sole on hind foot (Bailey 1931).

GENERAL CHARACTERS. *Chaetodipus eremicus* is a medium-sized pocket mouse with a long, heavily crested, tufted tail. Ventral pelage and tail, including tuft, are white. Pelage is coarse with numerous thin, elongate rump hairs (not spines) that are dark dorsally and light laterally. Dorsal pelage is buff and sprinkled with black, making this area appear brown or grayish. Pelage on sides resembles back and lateral lines are not present (Davis and Schmidly 1994; Yancey 1997).

Average external measurements (in mm) for individuals captured throughout the Trans-Pecos region of Texas (n = 74 males and 45 females) are: total length, 169.55; length of tail, 92.61; length of hind foot, 21.79; length of ear, 7.38 (Wilkins and Schmidly 1979). Average external measurements (in mm) for individuals from Brewster County, Texas, are: total length, 174.8 (n = 34); length of tail, 93.4 (n = 34); length of hind foot, 21.8 (n = 38); length of ear, 7.8 (n = 38—Manning et al. 1996). Mass of animals collected from Texas ranges from 15 to 23 g (sample size unknown—Davis and Schmidly 1994). Skull (Fig. 2) is similar to that of *C. penicillatus*. Average external and cranial measurements (in mm) of individuals from Guadalupe Mountains National Park, Texas, are: total length, 158.8; length of tail, 87.3; length of hind foot, 22.5; length of ear, 8.0; greatest length of skull, 25.2; zygomatic breadth, 13.5; interorbital breadth, 6.4; mastoid breadth, 13.0; length of maxillary toothrow, 3.6; interparietal width, 7.3; interparietal length, 3.6 (Genoways et al. 1977). Similar measurements are available for individuals from Trans-Pecos, Texas (Manning et al. 1996; Wilkins and Schmidly 1979), Chihuahua (Anderson 1972), Coahuila (Baker 1956), and San Luis Potosí (Dalquest 1951, 1953). Collectively, these studies indicate the following measurement ranges (in mm): total length, 157–185; tail length, 78–111; length of hind foot, 20–24; length of ear, 5–10; greatest length of skull, 24.2–26.6; mastoid breadth, 11.8–13.4; rostral length, 9.6–11.6; nasal length, 8.8–10.6; interparietal width, 5.9–7.3; interparietal length, 2.6–3.9; depth of cranium, 7.8–8.4; length of maxillary toothrow, 3.1–3.9; width of maxillary toothrow, 3.9–4.4. Interparietal is not in contact with mastoid bullae and is separated by narrow projections of parietals and supraoccipitals (Davis and Schmidly 1994; Yancey 1997).

DISTRIBUTION. *Chaetodipus eremicus* occurs in Chihuahuan Desert (Fig. 3) in central and northern Mexico (Chihuahua, Coahuila, and San Luis Potosí) and in southwestern United States (New Mexico and Texas—Hall 1981). No fossils are known (Wahlert 1993).

FORM AND FUNCTION. Dental formula is i 1/1, c 0/0, p 1/1, m 3/3, total 20 (Davis and Schmidly 1994). Lengths (in mm) of testes in summer were 6 (May), 6 (July), 4 (July), and 4 (August—Genoways et al. 1977).

Insensible water loss (mean ± *SE*) in *C. eremicus* was 0.033 ± 0.002 ml of water/h, or 0.803 ml/day (n = 14). Sexes do not differ in water loss (n = 7 males, 7 females). Water loss correlates with 0.0335 g of body mass lost/h via water evaporation (Lindeborg 1955). Average daily consumption of water is 0.20 ml, ranging from 0.04 to 0.51 ml/day (n = 5); individuals have survived 52–81 days without water (n = 6—Lindeborg 1952).

REPRODUCTION. Breeding begins in late February and pregnancies peak in April. Largest number of juveniles occurs in May. Smaller peaks in pregnancy rates occur in June and August. Number of embryos per litter averages 3.6–3.8 (Schmidly 1977; Yancey 1997). Young females can reach sexual maturity and become pregnant while still exhibiting juvenile pelage (Davis and Schmidly 1994). Individuals from smaller litters exhibit enhanced motor skills, suggesting a relatively better nutritional state (Punzo and Lau 2003).

ECOLOGY AND BEHAVIOR. The Chihuahuan Desert pocket mouse is found in association with soft or sandy alluvial soils and is rarely captured in rocky areas (Davis and Schmidly 1994; Findley et al. 1975; Jones and Manning 1991; Yancey 1997). In New Mexico, *C. eremicus* occurs in Plains-Mesa Sand Scrub habitat (Frey and Yates 1996), and in Texas, occupies desert scrub vegetation, such as catclaw (*Acacia*), creosotebush (*Larrea*), mesquite (*Prosopis*), and tasajillo (*Opuntia*—Schmidly 1977). Additional vegetation in occupied habitat may include shrubs (*Atriplex canescnens*, *Ephedra torreyana*, *Lycium*, and *Poliomintha incana*), grasses (*Bouteloua gracilis*, *Muhlenbergia arenacea*, *Oryzopsis hymenoides*, *Sporobolous airoides*, *S. cryptandrus*, and *S. flexuosus*), *Tiquilia hispidissima*, and *Yucca elata* (Root et al. 1999). Although desert scrub is preferred, individuals also occur

FIG. 1. Adult *Chaetodipus eremicus eremicus* from Canutillo, Dona Ana County, New Mexico. Photograph by T. L. Best.

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of an adult female *Chaetodipus eremicus eremicus* from 46.6 km E, 4.8 miles S El Paso City Hall, 372 m, El Paso County, Texas (University of Kansas Museum of Natural History 84588). Greatest length of skull is 25.2 mm.

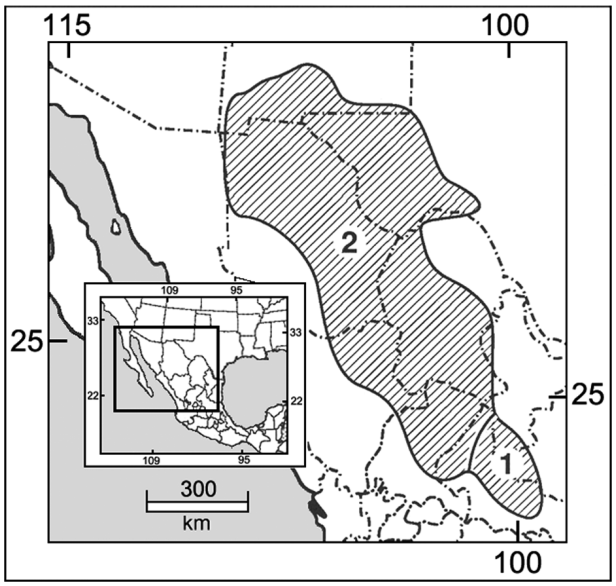

FIG. 3. Geographic distribution of *Chaetodipus eremicus* (modified from Hall 1981). Subspecies are: 1, *C. e. atrodorsalis*; 2, *C. e. eremicus*.

in grassland and riparian areas (Yancey 1997). In Texas, *C. eremicus* is the most common mouse in false willow (*Baccharis neglecta*)–mesquite river bottom habitat along the Rio Grande in the Big Bend region (Schmidly 1977), in Guadalupe Mountains National Park, Texas (Genoways et al. 1977), and in Big Bend Ranch State Park, Texas (Yancey 1997). *C. eremicus* also is the most common species on dunes at White Sands National Monument in southern New Mexico (Root et al. 1999).

Elongated or fan-shaped burrows near bases of bushes and shrubs remain closed during daytime; underground, several openings and tunnels radiate from central burrow cavity (Bailey 1905). *C. eremicus* is strictly nocturnal and feeds primarily on seeds, including those of broomweed (*Gutierrezia*), creosotebush, and mesquite, which have been found in cheek pouches (Davis and Schmidly 1994). Grasses are consumed when seeds are scarce (Schmidly 1977).

Individuals are active throughout the year, with peak activity occurring during spring (Clary et al. 1999; Yancey 1997; Zongyong et al. 1992). *C. eremicus* may enter periods of torpor for several days during winter (Schmidly 1977). Molting occurs during May–December, either from a single annual molt that occurs throughout this time or from 2 seasonal molts, 1 in spring and 1 in autumn (Manning 1996; Yancey 1997). Annual population turnover reaches nearly 95% (Goetze 1998).

Sympatric species of small mammals include *Chaetodipus hispidus*, *C. intermedius*, *C. nelsoni*, *Dipodomys merriami*, *Neotoma micropus*, *Perognathus flavus*, *Peromyscus eremicus*, *P. leucopus*, *P. maniculatus*, *P. pectoralis*, *Reithrodontomys fulvescens*, *R. megalotis*, *Spermophilus mexicanus*, *S. spilosoma*, and *Thomomys bottae* (Genoways et al. 1977; Yancey 1997). *C. eremicus* has been captured syntopically with both *C. intermedius* and *C. nelsoni* in a creosote scrub habitat with a substrate of rocks and gravel (Wilkins and Schmidly 1979; Yancey 1997).

Ectoparasites include mites (*Geomylichus brevispinosus* and *G. penicillatus*), lice (*Fahrenholzia pinnata*), and 2 species of flea (*Carteretta carteri* and *Meringis agili*—Eads 1960; Morlan and Hoff 1957; Vargas et al. 1999; Yancey 1997). *C. eremicus* harbors *Coccidioides immitis*, a pathogenic fungus that is the etiologic agent of valley fever (Whitaker et al. 1993).

GENETICS. Formerly recognized as a subspecies of *C. penicillatus*, *C. eremicus* was elevated to specific status based on DNA sequence analysis (Lee et al. 1996). Diploid number of chromosomes (46) is the same as for *C. penicillatus*, with a fundamental number of 56 (Lee et al. 1991; Patton 1970). The 6 largest pairs of autosomes are biarmed, with various centromere positions (from metacentric to subtelocentric). The medium-sized X chromosome is metacentric and homologous with X chromosomes of *C. intermedius*, *C. nelsoni*, and *C. hispidus*; the small Y chromosome is acrocentric (Lee et al. 1991). *C. eremicus* differs from *C. penicillatus* in number of autosomal arms (Patton 1969). Geographical, morphological, and chromosomal data support including *C. e. atrodorsalis* as a subspecies of *C. eremicus* (Hoffmeister and Lee 1967; Patton 1969, 1970). A zone of intergradation may exist between *C. eremicus* and *C. penicillatus* at the Continental Divide where these species come into contact (Hoffmeister and Lee 1967; Lee et al. 1996).

REMARKS. *Chaetodipus* is from the Greek *chaeta* referring to bristlelike hairs, *dis* meaning 2, and *pous* alluding to feet (Stangl et al. 1993). The specific epithet *eremicus* is from the Latin *eremicus*, which means of the desert or lonely (Jaeger 1955). An additional common name is the desert brush-tailed pocket mouse (Bailey 1905, 1931).

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