

*Chaetodipus artus*. By Troy L. Best and James Alden Lackey

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***Chaetodipus artus* (Osgood, 1900)**

Narrow-skulled Pocket Mouse

*Perognathus artus* Osgood, 1900:55. Type locality "Batopilas, Chihuahua, Mexico."

*C[haetodipus]. artus*: Hafner and Hafner, 1983:24. Elevation of subgenus to generic status.

**CONTEXT AND CONTENT.** Order Rodentia, Family Heteromyidae, Subfamily Perognathinae. The genus *Chaetodipus* contains 14 species. *C. artus* is monotypic (Hall, 1981).

**DIAGNOSIS.** *Chaetodipus artus* externally is similar to *C. goldmani*, but is slightly smaller, has a less hairy tail, and broader dorsal tail stripe (Burt and Hooper, 1941). Compared with *C. goldmani*, the skull of *C. artus* (Fig. 1) is smaller, has a broader supraoccipital (least width, 6.0 and 6.4 mm in two adult *C. artus*, but 5.7 mm in an adult *C. goldmani*), more rugose and more prominently ridged mastoids, and greater extensions of the premaxillae beyond the posterior borders of the nasals (<1 mm in *C. goldmani*, >1 mm in *C. artus*—Burt and Hooper, 1941). Anderson (1964) suggested using the following characteristics of *C. artus* to distinguish it from *C. goldmani*: rump bristles not well developed; skull smaller (based on occipitonasal length); skull narrower, based on mastoid breadth; mastoid smaller in area anterior to transverse ridge; transverse ridge on mastoid more strongly marked; auditory (tympenic) bullae smaller, in ventral aspect; ascending processes of premaxillae extend posterior to nasals a distance greater than the least breadth of one nasal bone; shorter total length; tail less hairy, especially in distal one-third, scalation more evident in basal part; dorsal tail stripe wider, in dorsal view white not visible along sides; supraoccipital wider, based on least supraoccipital breadth; mastoids more rugose, more pits; interparietal relatively wide; pelage darker; pigmentation of ears darker; dorsal pelage more uniform, less grizzled; baculum shorter, more curved, thicker in proportion to length, and base deflected ventrally; lacrimal suture with maxilla and frontal, as viewed in dorsal aspect, longer than the length of the lacrimal from the suture to tip; maxillofrontal suture extending farther posteriorly, relative to position of lacrimal; jugal in dorsal view thinner; temporal ridge less curved, and has no angular tuberosity on the anterior part of the squamosal; skull shallower; palatal pits deeper; exoccipital forming a distinct flange at the edge that meets the mastoid; stylomastoid foramen larger, more conspicuous.

Compared with *C. penicillatus*, *C. artus* has longer ears, narrower anterior and posterior zygomatic width, and shorter occipitobullar length, nasal length, premaxillonasal length, interorbital width, and translacrimar width. Compared with *C. intermedius*, it has longer toothrow, greater exoccipital width and nasal length, and shorter nasal projection, transdental width, occipitobullar length, interorbital width, and translacrimar width. When compared with *C. nelsoni*, *C. artus* has shorter nasal projection and interorbital width (Anderson, 1972). Compared with *C. pernix*, *C. artus* can be recognized by its larger size (interorbital constriction >5.8 mm—Caire, 1978). Compared with *C. baileyi*, *C. artus* is smaller (total length <200 mm—Hall, 1981).

**GENERAL CHARACTERS.** *Chaetodipus artus* is medium-sized for the genus (Best, in press). The length of the hind foot is 29% of the length of head and body, the length of tail is 125% of the length of head and body, and the tip of the tail is pectinate (Hatt, 1932). Mean measurements (in mm) of 20 adult males and 20 adult females, respectively, are: total length, 190.5, 180.0; length of body, 92.1, 85.9; length of tail, 98.5, 94.1; length of hind foot, 23.5, 22.9; length of ear, 10.8, 10.9; basal length of cranium, 16.7, 16.3; greatest length of cranium, 26.5, 25.7; maxillary arch spread, 13.0, 12.5; interorbital width, 6.5, 6.3; nasal length, 10.0, 9.6; intermaxillary width, 4.6, 4.6; alveolar length, 3.9, 3.8; lacrimal

length, 1.7, 1.6; maxillary arch width, 1.3, 1.2; basioccipital length, 4.0, 3.7; greatest depth of cranium, 8.6, 8.5; greatest width of cranium, 13.4, 12.9; zygomatic width, 13.3, 12.9; nasal width, 3.1, 3.1. Males of *C. artus* are significantly larger than females in total length, length of body, length of hind foot, basal length of cranium, greatest length of cranium, maxillary arch spread, interorbital width, nasal length, basioccipital length, greatest width of cranium, and zygomatic width (Best, in press).

**DISTRIBUTION.** *Chaetodipus artus* occurs from Sonora and adjacent Chihuahua southward through Sinaloa and western



FIG. 1. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Chaetodipus artus* from Rancho Guirrocoba, Sonora, Mexico (female, Natural History Museum of Los Angeles County 9735). Greatest length of cranium is 25.4 mm. Photographs by T. H. Henry.

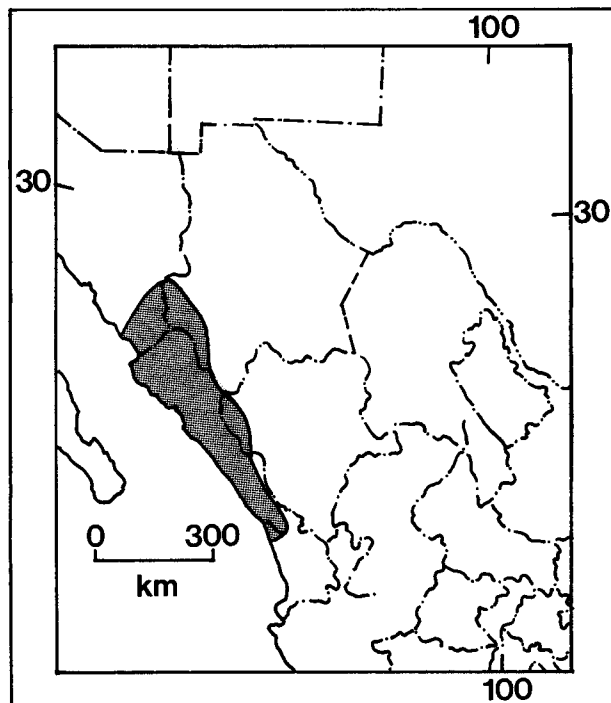


FIG. 2. Distribution of *Chaetodipus artus* in western Mexico (Hall, 1981).

Durango to northern Nayarit, Mexico (Fig. 2; Hall, 1981). No fossils of *C. artus* are known.

**FORM AND FUNCTION.** Dark-colored populations of *C. artus* occur in the drainage of the Río Septentrión, Chihuahua. Compared with other populations in Chihuahua, these populations are distinctly darker dorsally and ventrally, and have smaller dorsal mastoid parts of bullae, but in size and in other cranial details the dark populations do not differ from others. The areas in which the dark populations occur have relatively dark soil, perhaps due to greater humidity. Darkness of *C. artus* probably resulted from heavier predation on paler individuals (Anderson, 1972).

Sebaceous glands are present at the oral lips and angle (Quay, 1965a). Specialized sebaceous caudal glands occur about 25–33% of the distance from the base of the tail to the tip, and are restricted to the ventral surface. Sebaceous glands associated with hair follicles of the dorsal surface of the tail are not significantly enlarged or modified. In *C. artus*, the ventral area of glandular tissue is >1 mm in depth and accounts for 20% of the dorsoventral diameter of the tail. These bilobed glands are larger in males than in females. In males, each lobe is a compound, alveolar gland having multiple and extensive branchings. The main duct of the gland is derived from a hair follicle, but a hair shaft is absent. The duct system frequently includes epithelial cysts distally, but proximally houses groups of follicle mites in different stages of development. A female captured at the same time as a male lacked cysts and enlarged caudal glands, but did possess a few follicle mites in hair follicles of the same region (Quay, 1965b).

The baculum of *C. artus* has an enlarged basal portion and a shaft that tapers gradually from the base of the tip. In lateral view, the baculum is sigmoid in outline, with the tip of the shaft curving upward at an angle of about 90° to the long axis of the baculum. Average measurements (in mm) of the bacula of six specimens in which length of head and body averaged 84 mm, are: length, 13.67; dorsoventral diameter of the base, 0.89; and lateral diameter of the base, 0.77 (Burt, 1936). Nothing is known about ontogeny and reproduction of *C. artus*.

**ECOLOGY.** *Chaetodipus artus* is granivorous (Morton, 1979). In Chihuahua, *C. artus* is found only in habitats such as barrancas having rocks of various size, but with no extensive rock-free areas (Anderson, 1972). In Durango, it occurs on the subtropical western slopes of the Sierra Madre Occidental (Baker and Greer, 1962). In Sonora, it is found with *C. goldmani* on sandy areas among mesquite

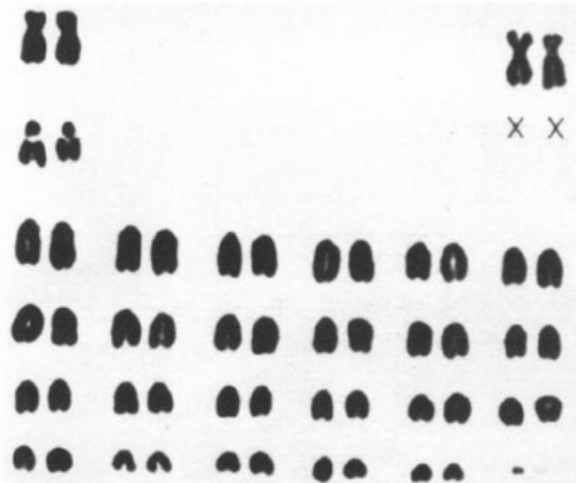


FIG. 3. Karyotype of *Chaetodipus artus* from near Pericos, Sinaloa (Patton, 1967).

(*Prosopis*) along the Río Mayo near Carimechi (Burt and Hooper, 1941). In mountainous regions of southern Sonora, *C. artus* is common along creek bottoms and the edges of cultivated fields (Burt, 1938). In northern Sinaloa and southern Sonora, this species occurs inland at higher elevations characterized by higher humidity and a more tropical flora than found along the coasts (Anderson, 1964). In this region, *C. artus* replaces *C. goldmani* in riparian communities and in the more mesic, fully developed, short-tree forest habitats. The distribution of *C. artus* in those regions apparently is dendritic. To the east, in the humid tropical forests near the base of the Sierra Madre Occidental, the distribution apparently is extremely dendritic with this species restricted to the bottoms of the barrancas cutting the western slopes. *C. artus* possibly reduces gene flow between various chromosomal races of *C. goldmani* in Sinaloa and Sonora as a consequence of inhabiting the immediate vicinity of rivers, thereby separating populations of *C. goldmani* found in drier habitats between rivers (Patton, 1969).

Associated mammals include *Liomys pictus*, *C. pernix* (Loomis, 1971), *C. goldmani*, *Lepus alleni*, *Onychomys torridus*, *Neotoma albigula*, and *Peromyscus eremicus* (Lucas and Loomis, 1968). In addition to the previously mentioned mites associated with the hair follicles, ectoparasites include the chiggers *Euschoengastoides annectens*, *E. arizonae*, *E. expansellus*, *E. tumidus* (Loomis, 1971), *Hexidionis allredi* (Lucas and Loomis, 1968), *Hyponeocula rugosa* (Tanigoshi and Loomis, 1974), *Otorhinophila intrasola* (Loomis and Wrenn, 1973; Wrenn and Loomis, 1967), and *O. sinaloae* (Wrenn and Loomis, 1967). No other parasites are known (Whitaker, in press).

**GENETICS.** The diploid number of chromosomes is 54 and the fundamental number is 54 (Fig. 3). The karyotype consists of 1 pair of large submetacentrics, 1 pair of large "rabbit-ear" acrocentrics, 24 pair of large to small acrocentrics (including a pair of micro-chromosomes), a large submetacentric X chromosome, and a small acrocentric Y chromosome (Patton, 1967). *C. artus* possesses the ancestral-type X chromosome and the same fundamental number of the hypothetical ancestor and the majority of the chromosome races of *C. goldmani*. Only one fusion and a deletion of part of a small acrocentric autosome would be required to derive *C. artus* directly from the hypothetical arrangement of the ancestral *C. goldmani* (Patton, 1969).

The mean number of alleles per locus was 1.400 at 26 loci in 12 individuals of *C. artus* from two localities. The mean proportion of loci polymorphic per population was 0.192 and the mean proportion of loci heterozygous per individual was 0.072 (range, 0.058–0.087—Patton et al., 1981).

**REMARKS.** Based on morphology, *C. artus* and *C. goldmani* were considered conspecific by Hall and Ogilvie (1960). However, after a detailed study of larger samples, Anderson (1964) concluded they were distinct species and recorded numerous localities of sympatry. Subsequent studies by Patton (1967, 1969) revealed distinctive differences between the two species in the morphology of the

X chromosome and in the size and position of the centromeres of bi-armed chromosomes. *C. artus* and *C. goldmani* were considered sibling species due to the great similarity in karyotypes, exemplified by the presence in both species of a pair of "rabbit-ear" chromosomes. This chromosomal type occurs in no other species in the genus *Chaetodipus* (Patton, 1967). Phenetic analyses of morphologic characters placed *C. artus* near *C. pernix* (Best, in press; Caire, 1976) and *C. goldmani* (Best, in press).

*Chaetodipus* is derived from the Greek *chaeta* referring to bristle-like hairs, *di* meaning two, and *podos* alluding to feet. The specific epithet *artus* is derived from the Latin *artus* meaning straight or narrow (Jaeger, 1955), presumably in reference to the relatively narrow skull of this species.

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