

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

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Dipodomys phillipsii Gray, 1841
Southern Banner-tailed Kangaroo Rat

Dipodomys phillipsii [sic] Gray, 1841:522. Type locality "near Real del Monte," Hidalgo.

Dipodomys ornatus Merriam, 1894:110. Type locality Berriozábal, Zacatecas.

Dipodomys perotensis Merriam, 1894:111. Type locality Perote, Veracruz.

CONTEXT AND CONTENT. Order Rodentia, Family Heteromyidae, Subfamily Dipodomysinae. The species contains four subspecies (Genoways and Jones, 1971) as follows:

- D. p. phillipsii* Gray (1841:522), see above.
- D. p. ornatus* Merriam (1894:110), see above.
- D. p. perotensis* Merriam (1894:111), see above.
- D. p. oaxacae* Hooper (1947:48). Type locality Teotitlán, 950 m, Oaxaca.

DIAGNOSIS. Kangaroo rat of moderate size; four toes on hind foot; tail relatively long, its dark stripes uniting in distal third, and usually tipped with white; cranium (figure 1) flattened, postrostral region nearly quadrate owing to relatively great breadth across orbital portion of maxillae coupled with relatively small mastoidal bullae; maxillary plate projecting posteriorly to level of second or third molar; rostrum narrow and parallel-sided; dental formula, as in all other heteromyids, $i\ 1/1, c\ 0/0, p\ 1/1, m\ 3/3, a$ total of 20; incisors slender and slightly built in relation to other species in the genus.

GENERAL CHARACTERS. Dorsal color ranging from ochraceous through cinnamon to brownish, admixed with black hairs; average middorsal reflectance readings (as a percentage of pure white) from 15 samples from throughout the geographic distribution of the species ranged from 12.1 to 18.2 for red, 6.6 to 10.3 for green, and 5.9 to 8.8 for blue (Genoways and Jones,

1971:273); arietiform facial markings blackish and extensive. Juvenile pelage is less luxuriant, grayer, and darker dorsally than that of adults, and the individual hairs are finer.

Externally, *D. phillipsii* is characterized by a small body and long, slender, "banner," tail. There is little secondary sexual differentiation among adults. Means for total length (in millimeters) of adults from 15 samples from throughout the range of the southern banner-tailed kangaroo rat (Genoways and Jones, 1971:272) ranged from 244.3 to 279.7, length of tail from 155.0 to 176.7, and length of hind foot from 34.0 to 41.8. Ranges of means of cranial dimensions for rats from the same 15 samples were: greatest length of skull, 34.1 to 42.0; maxillary breadth, 18.8 to 22.5; mastoid breadth, 21.3 to 23.4; interorbital constriction, 11.2 to 14.1; depth of cranium, 12.5 to 13.6; length of maxillary toothrow, 4.4 to 5.3.

Geographic variation is marked within the known range of the species. Rats of northern populations (*D. p. ornatus*) are medium to large in size, relatively pale in color, and have a medium to broad cranium. *D. p. phillipsii* of the Valle de México and adjacent areas is of medium size, dark in color, and has a broad interorbital region. *D. p. perotensis* of Tlaxcala, Puebla, and Veracruz is large in size, intermediate between *ornatus* and *phillipsii* in color, and has a broad mastoid region and relatively narrow interorbital and maxillary regions, whereas the southern *D. p. oaxacae* is characterized by being much smaller and paler than other races.

DISTRIBUTION. The species is known from the Mexican Plateau and adjacent areas from central Durango to northern Oaxaca. Distribution of the four subspecies is shown in Figure 2. Known altitudinal distribution is from slightly more than 3000 ft (950 m) in Oaxaca up to more than 9000 ft (2850 m) in Veracruz. No fossils of *D. phillipsii* are known.

FORM AND FUNCTION. Little has been published on form in this species save for information on external and cranial features mentioned above. Merriam (1893:96) recorded the number of caudal vertebrae as 32 and Davis (1942) described some details in comparing *phillipsii* with the Texas kangaroo rat, *D. elator*. Similarly, no physiological or anatomical data are available on function.

The baculum (figure 3) has been described and figured by Lidicker (1960), Burt (1960), Genoways and Jones (1971), and Best and Schnell (1974). The basal area is nearly round in cross section and may have irregular tuberosities on its surface. The shaft tapers gradually and terminates in an up-

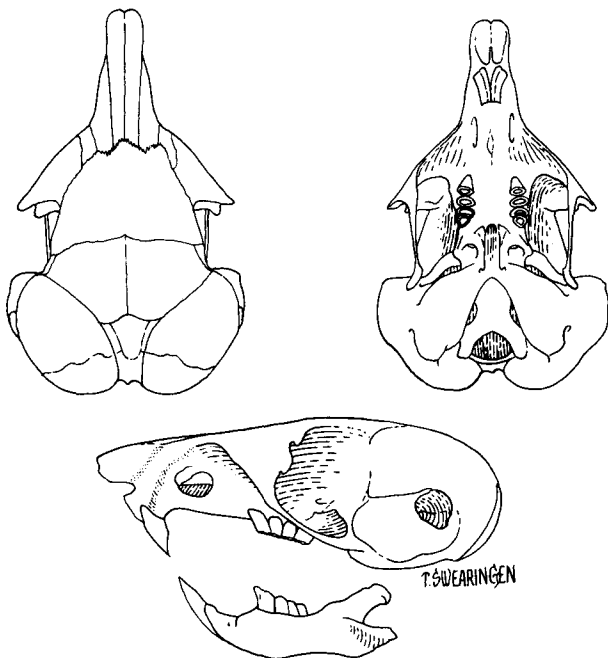


FIGURE 1. Dorsal, ventral, and lateral views of skull, and lateral view of lower jaw of *Dipodomys phillipsii perotensis*, KU 30052, female, from Veracruz.

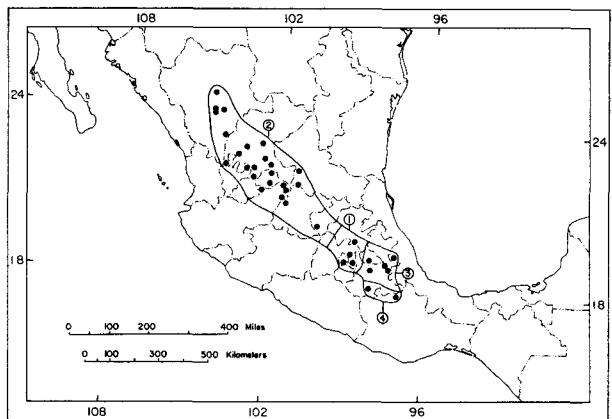


FIGURE 2. Geographic distribution of *Dipodomys phillipsii*. Subspecies are as follows: 1, *D. p. phillipsii*; 2, *D. p. ornatus*; 3, *D. p. perotensis*; 4, *D. p. oaxacae*. Map after Genoways and Jones (1971:281).

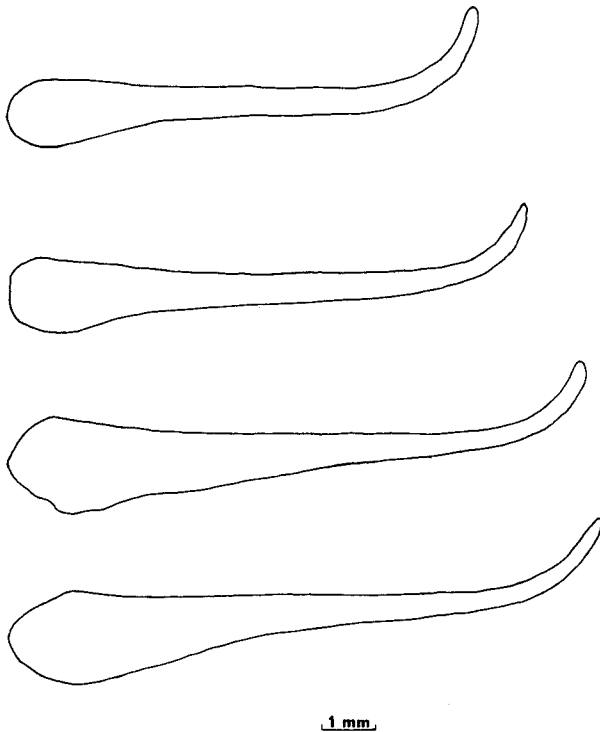


FIGURE 3. Representative bacula of *Dipodomys phillipsii* (after Genoways and Jones, 1971:279).

turned tip. Burt found the tip to be sharply upturned in the one Oaxacan specimen he examined, thus differing from other members of the genus that he studied, but bacula figured by Lidicker and by Genoways and Jones do not exhibit a sharp angle. Length of 12 bacula ranged from 9.1 to 12.7 mm, height of base from 1.3 to 2.2, and width of base from 0.9 to 1.9.

ONTOGENY AND REPRODUCTION. Little is known of reproduction in this kangaroo rat. Genoways and Jones (1971) recorded a female taken on 1 June in Durango that contained two embryos (25 mm in crown-rump length) and two from Jalisco, collected on 25 October, that each carried three embryos (16 and 24 in crown-rump length). They also reported that in samples from 10 months of the year (January and March not represented) juveniles were present in all but three months (April, August, and November) and young individuals were represented in all 10 months. This led them to conclude: "These data would seem to indicate a more prolonged reproductive period than can be deduced from the meager data on known reproduction in females."

Lengths of testes were recorded as 9 mm (3 June), 12 (23 June), and 11 (15 August) in three adult males by Genoways and Jones (1971). Hall and Dalquest (1963:283) noted that "several males" had "enlarged testes" in Veracruz in autumn.

Ontogeny has not been studied although Genoways and Jones (1971) recorded variation with age in external and cranial size among museum specimens of "juveniles," "young," and "adults" from Veracruz.

ECOLOGY. Southern banner-tailed kangaroo rats occur primarily on sandy soils in areas of short grass where clumps of prickly pear, nopal cactus, or low thornbrush obtain. In Veracruz, Hall and Dalquest (1963:282) found *D. phillipsii* "only on open sandy desert, where there were some shrubs, weeds, cactus and maguey plants." In southwestern San Luis Potosí, Dalquest (1953:117) took this rat "only in the rocky hills and mountains," one being obtained almost at the edge of oak forest. A selection of typical habitats and mammalian associates was detailed by Genoways and Jones (1971:284-285), and other habitats were discussed by Merriam (1893) and Villa-R. (1953). Baker and Greer (1962:103) took *phillipsii* in Durango in an intermontane valley "covered with short grass, scattered catclaw, prickly pear and clumps of low-growing weeds," and also in the Guadiana lava field "on range lands of short grasses and scattered clumps of large *Opuntia*

and some catclaw amid low hills and outcrops of dark lava rock." Rats from the lava area were somewhat darker than those from elsewhere in Durango (Baker, 1960: 316).

Little has been recorded on foods of *D. phillipsii*. E. W. Nelson (Merriam, 1893:88) found the cheek pouches of captured individuals to contain "seeds and small green leaves or young plants" in the Distrito Federal. Hall and Dalquest (1963:282) reported finding dandelion leaves in a burrow. They indicated this rat refused baits such as rolled oats, banana, walnuts, peanuts, and peanut butter. They finally captured several specimens in traps baited with seeds from native weeds and also trapped individuals by concealing traps at the entrances to burrows. Other investigators have not always reported similar difficulties in trapping these rats, although there may well be seasonal differences in bait acceptance. Hunting this nocturnal rodent at night also has been successfully employed as a means of collecting.

Merriam (1893) reported that Nelson found burrow systems with but a single entrance that were dug in bare, open fields. He noted that burrows entered the ground at a slight angle through a trough-like depression, and that well-marked trails led away from each burrow. Nelson found that rats were active on calm nights even when the temperature was below freezing but that they did not forage during severe storms. Rarely, snow covers burrows as far south as central México. At Tlalpam, Distrito Federal, Nelson suggested that *D. phillipsii* shared its burrows with *Perognathus flavus*.

Hall and Dalquest (1963), however, recorded that in Veracruz two to five entrances were found a few feet apart for each burrow system, the entrances about 3 inches (75 mm) in diameter. "The tunnels from these entrances joined within a meter, where the burrow was about two inches in diameter." Burrows were not plugged. A burrow excavated in September was a foot below the surface. "The main entrance was marked by a small mound of fresh sand. The main burrow was a slightly curved tube, four feet in length, and ending in a swollen chamber. . . . Approximately two feet from the end of the main burrow it branched, one part consisting of a two-foot long tube . . . that opened on the surface where there was no pile of sand. The kangaroo rat escaped through this entrance when we opened its burrow." No nest was found in this burrow system.

We know of no parasites recorded from the southern banner-tailed kangaroo rat.

GENETICS. Stock (1974) described the karyotype of this species under the name *D. ornatus*. He found a diploid number of 72 chromosomes and a fundamental number of 138. There were 12 pairs of submetacentric chromosomes in the autosomal complement, 22 pairs of subtelocentrics, and one telocentric pair. The X chromosome was submetacentric and the Y was telocentric. No other genetic data are available for the species.

REMARKS. *Dipodomys phillipsii* is the type species of the genus *Dipodomys* (Gray, 1841:522). The species was revised systematically by Genoways and Jones (1971), whose account included both univariate and multivariate analyses of external and cranial dimensions and of color.

According to Merriam (1893), *Macrocolus halticus* Wagner, 1846, with type locality at an unknown site in México, is a synonym of *D. phillipsii*, but this has not been mentioned by recent authors.

ETYMOLOGY. The generic name *Dipodomys* is a combination of two Greek words, *dipodos* (two-footed) and *mys* (mouse), referring to the bipedal mode of locomotion of this rodent. The specific name *phillipsii* gives patronymic recognition to John Phillips, who collected the holotype. The subspecific names *ornatus*, *perotensis*, and *oaxacae*, refer to ornate color, Perote (Veracruz), and the state of Oaxaca, respectively.

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