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PRELIMINARY DESCRIPTIONS OF ELEVEN NEW KANGAROO RATS OF THE GENERA *DIPODOMYS*  
AND *PERODIPUS*.

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The following brief descriptions are here published in advance of a monographic revision of the group which will appear shortly. Of the eleven new forms here defined, *Dipodomys elator* from northern Texas; *D. ornatus* from the state of Zacatecas, Mexico; *D. m. nitratus* from Owens Lake, California; *Perodipus streator* from the west slope of the Sierra Nevada, and *P. panamintinus* from the Panamints Mts. in California require no comparison with previously described species. The others are less sharply differentiated.

*Dipodomys elator* sp. nov.

*Type* from HENRIETTA, CLAY CO., TEXAS. No. 64,802 ♂ ad. U. S. Nat. Museum, Department of Agriculture Collection. Collected April 13, 1894, by J. Alden Loring (Original number 1,804).

*Measurements* (taken in flesh).—*Type*: Total length 292; tail vertebræ 173; hind foot 47. Ear from anterior base 14 (in dry skin).

*Average* measurements of 2 specimens from type locality: Total length 290; tail vertebræ 170; hind foot 45.5.

*General characters*.—Similar to *Dipodomys spectabilis* but considerably smaller, with much smaller ears; tail more slender and paler, with shorter white pencil; hind feet relatively longer;



facial crescents heavier; nose blacker. Cranial characters unique.

*Color*.—Upper parts clay-color, lined with dark-tipped hairs on head and back, becoming pale ochraceous buff on flanks; thigh patches large; facial crescents broad and indistinctly continuous to end of nose which is broadly blackish; inner side of legs dusky; dorsal and ventral tail stripes barely meeting in front of white pencil, the white lateral stripes being almost continuous to the white tip; ventral dark stripe pale; dorsal dark stripe pale for proximal  $\frac{2}{3}$ , becoming blackish on crested part; white pencil rather short, measuring about 23 mm. beyond the tips of the black hairs in the two specimens at hand.

*Cranial characters*.—Skull small for the size of the animal; rather highly arched on top as in *D. phillipsi*; supraoccipital between mastoid bullæ broader than in any other known species; interparietal nearly as broad as long; ascending branches of premaxillæ broad and slightly expanded posteriorly; nasals somewhat narrowed posteriorly; top of skull broad but not broad enough to hide zygomatic arches, which are far apart; sides of frontals sloping strongly inward from point slightly anterior to plane of fronto-parietal suture; nasals decidedly longer than frontal breadth immediately behind lachrymals. Mandible small for size of skull; angle large and pointed. Upper premolar an incompletely double prism, its crown with a well developed antero-internal lobe.

*Dipodomys ornatus* sp. nov.

*Type* from BERRIÓZABAL, ZACATECAS, MEXICO. No. 57,990 ♀ ad. U. S. Nat. Mus. Department of Agricultural Collection. Collected December 29, 1893 by E. A. Goldman. (Original number 5,613.)

*Measurements* (taken in flesh).—*Type*: Total length 274; tail vertebræ 167; hind foot 39. Ear from anterior base 15 (in dry skin).

*General characters*.—Similar to *Dipodomys phillipsi* in size and pattern of markings but brighter and more golden in color; dark markings more extensive and blacker, ears somewhat larger; hind foot shorter; tail crested penicillate, its tip white.

*Color*.—Upper parts bright golden clay-color, darkest on head and median back, brightest on sides; thigh patches large; facial crescents large, broad, and very black, meeting broadly over bridge of nose which is solid black for  $\frac{1}{3}$  the distance from nostrils to eye except a small white spot over extreme end of nose; narrow ring round eye, inner sides of hind legs, and dorsal and ventral tail stripes black; tip of tail pure white. The white side stripes of the tail disappear near the junction of the distal and middle thirds, the black stripes uniting in a broad belt anterior to the white pencil. The face is mainly white between the eye and facial crescent, though the white is somewhat obscured, particularly near the eye, by dark-tipped hairs.

*Cranial characters*.—Skull similar to that of *D. phillipsi* in general size and form, but proportions different. Mandible larger and heavier with much longer and broader angular processes. The basal length and mastoid



breadth are essentially the same in the two species, but the naso-occipital length in *ornatus* is much less and the zygomatic breadth very much greater. While the zygomatic breadth is actually greater in *ornatus*, the breadth across the top of the skull is decidedly less: hence when viewed from above, the zygomatic arches stand out beyond the sides of the cranium, while in *phillipsi* they are hidden beneath the edges of the frontals and parietals. In *ornatus* the top of the cranium is much flatter than in *phillipsi*; the supraoccipital is narrower between the mastoid bullæ; the nasals are not narrowed behind, and the ascending branches of the premaxillæ are shorter and more slender and have no trace of the posterior expansion commonly present in *phillipsi*. The upper premolar is a single prism and its crown has no trace of the antero-internal lobe of *phillipsi*.

*Dipodomys perotensis* sp. nov.

*Type* from PEROTE, VERA CRUZ, MEXICO. No. 54,285 ♀ ad. U. S. Nat. Mus. Department of Agriculture Collection. Collected May 21, 1893 by E. W. Nelson (Original number 4840).

*Measurements* (taken in flesh).—*Type*: Total length 265; tail vertebræ 162; hind foot 40. Ear from anterior base 14 (in dry skin).

*Average measurements* of 8 specimens from type locality: Total length 271; tail vertebræ 168; hind foot 40.4.

*General characters*.—Similar in size and general appearance to *Dipodomys phillipsi* and *ornatus* and intermediate between them in coloration; white terminal pencil short, and in one specimen absent. Cranial characters substantial.

*Color*.—Upper parts brownish clay color, intimately mixed with and darkened by blackish-tipped hairs on head and back; strongly suffused with ochraceous buff on sides and flanks; facial crescents large and black, meeting across the nose; inner side of leg and sole blackish; lateral white stripes of tail disappearing near junction of distal and middle thirds; white terminal pencil small and in one specimen absent (possibly the result of injury in early life).

*Cranial characters*.—Skull similar to that of *D. ornatus*, but even narrower on top [consequently very different from *phillipsi*]; zygoma visible from above; top of skull more strongly arched anteroposteriorly than any other known species; breadth of supraoccipital between inflated mastoids greater than in *phillipsi* or *ornatus*. Angle of mandible larger than in *phillipsi* but smaller than in *ornatus*.

*Dipodomys merriami nevadensis* subsp. nov.

*Type* from PYRAMID LAKE, NEVADA. No. 54,552 ♀ ad. U. S. Nat. Mus., Department of Agriculture Collection. Collected June 26, 1893, by Vernon Bailey (Original number 3,990).

*Measurements* (taken in flesh).—*Type*: Total length 240; tail vertebræ 140; hind foot 39. Ear from anterior base 13 (in dry skin).



*Average measurements of five adults from type locality*: Total length 243; tail vertebræ 143.5; hind foot 39.9.

*General characters*.—Similar to *D. merriami* but with shorter tail and longer hind foot; coloration paler and more buffy.

*Color*.—Upper parts pinkish buff, darkened on head and back by intermixture of dark-tipped hairs; facial crescents distinct but hardly meeting across nose, though bridge of nose is somewhat darkened; face in front of eyes pure white except where interrupted at base of whiskers by facial crescents; underparts and thigh stripes pure white; dorsal and ventral tail stripes dusky, meeting at end of tail; inner side of legs to heel dusky.

*Dipodomys merriami nitratus* subsp. nov.

*Type* from KEELER, EAST SIDE OF OWENS LAKE, CALIFORNIA (No. <sup>25359</sup><sub>32772</sub> ♂ ad. U. S. Nat. Mus. Department of Agriculture Collection). Collected December 29, 1890 by E. W. Nelson (Original number 160).

*Measurements* (taken in flesh).—*Type*: Total length 237; tail vertebræ 140; hairs 26; hind foot 39. Ear from anterior base 13 (dry skin). Basilar length of skull 22 mm.

*Average measurements of 23 specimens from type locality*: Total length 239; tail vertebræ 141; hind foot 37.8.

*General characters*.—Smaller than *D. merriami*, with relatively larger hind feet and wholly different coloration; dusky markings obsolete.

*Color*.—Upper parts uniform intense ochraceous or tawny-buff not mixed with black-tipped hairs; facial crescents obsolete; no dusky or blackish markings anywhere; no superciliary stripe, but a distinct white spot over eye; upper and lower tail stripes concolor with back; white side stripes continuous.

*Dipodomys merriami nitratoides* subsp. nov.

*Type* from TIPTON, SAN JOAQUIN VALLEY, CALIFORNIA. No. 54,674 ♂ ad. U. S. Nat. Mus. Department of Agriculture Collection. Collected June 25, 1893, by Clark P. Streater (Original number 2,978).

*Measurements* (taken in flesh).—*Type*: Total length 246, tail vertebræ 148; hind foot 36. Ear from anterior base 12 (in dry skin).

*Average measurements of 13 specimens from type locality*: Total length 237; tail vertebræ 144; hind foot 35.

*General characters*.—Similar to *D. m. nitratus* in size and color, but with strongly marked facial crescents meeting over bridge of nose; ears smaller.

*Color*.—Upper parts everywhere uniform fulvous; facial crescents dusky and meeting over bridge of nose; dorsal tail stripe darker than back; crested part of tail same color as back; ventral tail stripe dull fulvous, con-



tinuous to end of tail; inner aspect of hind legs to heel dull fulvous; under parts and thigh stripe white; spot over eye obscured by dark tipped hairs.

*Dipodomys merriami exilis* subsp. nov.

*Type* from FRESNO, SAN JOAQUIN VALLEY, CALIFORNIA. No. <sup>34843</sup><sub>43823</sub>  
♂ yg. ad. U. S. Nat. Mus. Department of Agricultural Collection. Collected September 23, 1891, by Vernon Bailey (Original number 3,277).

*Measurements* (taken in flesh).—*Type*: Total length 241; tail vertebræ 143; hairs 21; hind foot 33. Ear from anterior base 12 (in dry skin). Bisilar length of skull 21 mm.

*Average measurements* of 20 specimens from type locality: Total length 227; tail vertebræ 135.5; hind foot 34.

*General characters*.—Similar to *Dipodomys merriami* but smaller and darker, with upper surface of nose and posterior aspect of ankles black.

*Color*.—Upper parts nearly uniform clay color, darkened with sepia from abundant admixture of black-tipped hairs, and darkest on the head; sides and flanks tinged with ochraceous-buff; black crescents at base of whiskers sharply defined and meeting in median line so that the bridge of the nose is black: superciliary stripe whitish, not interrupted as in *D. merriami*; ears dark; posterior aspect of ankles and lower leg black; upper and lower tail stripes sooty blackish, meeting along terminal third, thus interrupting the white side stripes; under parts silky white.

*Cranial characters*.—Skull similar to that of *D. merriami* but much smaller; nasal bones shorter.

*Dipodomys merriami atronasus* subsp. nov.

*Type* from HACIENDA LA PARADA, SAN LUIS POTOSI, MEXICO. No. 50,276  
♂ ad. U. S. Nat. Mus. Department of Agriculture Collection. Collected August 20, 1892, by E. W. Nelson. (Original number 3,229).

*Measurements* (taken in flesh).—*Type*: Total length 267; tail vertebræ 162; hind foot 40.

*Average measurements* of 4 specimens from type locality: Total length 250; tail vertebræ 152; hind foot 38.5.

*General characters*.—Similar to *D. merriami* but darker; pelage coarser, particularly on head.

*Color*.—Upper parts dark clay-color, everywhere mixed with dark-tipped hairs and suffused with ochraceous buff, which is strongest on the sides; nose from black tip to between eyes grizzled with coarse yellowish, dark-tipped hairs; facial crescents large, black, meeting over end of nose; inner side of thighs and dark tail stripes blackish; white lateral tail stripes mixed with dark hairs and disappearing in middle third of tail.

*Perodipus streator* sp. nov.

*Type* from CARBONDALE, MARIPOSA CO., CALIFORNIA (at west foot of Sierra Nevada). No. 64,310 ♀ ad. U. S. Nat. Mus. Department of



Agriculture Collection. Collected April 3, 1894, by Clark P. Streater. (Original number 3,673).

*Measurements* (taken in flesh). *Type*: Total length 292; tail vertebrae 179; hind foot 43. *Average* of 26 specimens from type locality: Total length 295; tail vertebrae 180; hind foot 43.

*General characters*—Similar to *P. agilis* but larger; ears smaller; tip of tail normally white.

*Color*.—Upper parts Isabella brown, darker along the middle of the back and on sides of neck; sides and flanks suffused with ochraceous buff; a distinct white spot over eye and at base of ear; top of nose, crescent through base of whiskers, and narrow ring around eye blackish; a band of white overlaid by dark-tipped hairs runs from base of whiskers to ear, including the eye; innerside of thigh and sole of foot blackish; dorsal and ventral tail stripes dusky, meeting in a broad subapical dark ring beyond which the end of the tail is normally *pure white* as in many species of *Dipodomys*; under parts, thigh stripes, and ring at base of tail pure white. Two very young specimens have the white tip of the tail sharply defined but short; some of the old specimens lack the white tip, in others the white side-stripes are nearly continuous to the tip.

*Cranial characters*.—Skull similar to that of *P. agilis* but larger and heavier; parietals longer antero-posteriorly (inner border decidedly longer than anterior); fronto-parietal suture strongly sinuous, convex forward at median line; supraoccipital broader between mastoid bullae on top of skull.

*Dental characters*.—Molariform teeth larger and heavier; crown of last upper molar longer antero-posteriorly and usually more subquadrate; osteodentine islands dark.

*Perodipus panamintinus* sp. nov.

*Type* from PANAMINT MTS., CALIFORNIA (on head of Willow Creek). No. 28566 ♂ ad. U. S. Nat. Mus. Department of Agricultural Collection. Collected May 12, 1891, by E. W. Nelson (Original number 853).

*Measurements* (taken in flesh).—*Type*: Total length 305; tail vertebrae 183; hind foot 44. Ear from anterior base 15 (in dry skin).

*Average* measurements of 16 specimens from type locality: Total length 301; tail vertebrae 180.6; hind foot 44.6.

*General characters*.—Largest species of the genus; coloration ochraceous buffy; does not require comparison with any known species.

*Color*.—Upper parts pale buffy clay-color, tinged with pale ochraceous; thigh patches large, colored like back; facial crescents and end of nose broadly blackish but barely or not continuous over sides of nose; inner sides of legs dusky; dorsal and ventral tail stripes pale dusky, the ventral stripe failing or indistinctly continuous on distal third, permitting the lateral white stripes to meet below on distal third, nearly as in *P. richardsoni*. Eyelids and anterior part (more than  $\frac{1}{2}$ ) of reflexed upper border of ear blackish; posterior part of ear whitish.



*Perodipus ordi columbianus* subsp. nov.

*Type* from UMATILLA, PLAINS OF COLUMBIA, OREGON. No. <sup>24181</sup><sub>31594</sub> ♀ ad. U. S. Nat. Museum. Department of Agriculture Collection. Collected Oct. 18, 1890, by Clark P. Streater (Original number 386).

*Measurements* (taken in flesh).—*Type*: Total length 254; tail vertebræ 148; hind foot 40. Ear from anterior base 13 (in dry skin).

*Average measurements* of 15 specimens from type locality: Total length 244.5; tail vertebræ 140.5; hind foot 39.

*General characters*.—Similar to *P. ordi* but less ochraceous in color and with markings more pronounced; ears blackish instead of flesh color; supraorbital white spots more conspicuous.

*Color*.—Upper parts clay-color, finely mixed with dark-tipped hairs; thigh patches large, more tinged with ochraceous than rest of upper parts, this color reaching down on inner side of leg in a narrow stripe to heel [no dusky on inner side of leg]; facial crescents blackish and nearly continuous with a blackish spot on end of nose; supraorbital white spots unusually conspicuous; interior of ear conch and reflexed upper border blackish; back side of ear whitish; dorsal and ventral tail stripes dusky, the ventral failing or nearly failing on terminal fourth, where the white sides stripes commonly meet or nearly meet for a short distance; tip of tail dusky all round from upper stripe.

*Cranial characters*.—The skull of *columbianus* differs from that of typical *ordi* in having the basioccipital much broader, the postero-external angle of the maxillary wing of the zygoma more strongly produced backward and downward and the angle of the mandible larger.





Merriam, C. Hart. 1894. "Preliminary descriptions of eleven new kangaroo rats of the genera *Dipodomys* and *Perodipus*." *Proceedings of the Biological Society of Washington* 9, 109–115.

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