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# Four New Pocket Gophers of the Genus Cratogeomys from Jalisco, Mexico

 $\mathbf{BY}$ 

ROBERT J. RUSSELL

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## Four New Pocket Gophers of the Genus Cratogeomys from Jalisco, Mexico

By

#### ROBERT J. RUSSELL

In the course of my taxonomic study of the genus *Cratogeomys*, a high degree of variation was found between several populations of these gophers in central Jalisco. Two species, *C. gymnurus* and *C. zinseri*, occur in this part of the state. Previously *C. gymnurus* was known only from southern Jalisco and *C. zinseri* only from extreme eastern Jalisco, but through the efforts of J. R. Alcorn specimens were obtained of both species in the central part of the state. These large gophers are difficult to collect, and I am grateful to him for securing this significant material. Costs of the field work were defrayed by the National Science Foundation and the Kansas University Endowment Association. Thanks are due also to those in charge of the United States Biological Surveys Collection for the loan of comparative material. Study of the recently acquired specimens taken in central Jalisco reveals two undescribed subspecies each of *C. gymnurus* and *C. zinseri*. These may be known and described as

#### Cratogeomys gymnurus tellus new subspecies

*Type.*—Female, adult, skull and skin, No. 33454 Mus. Nat. Hist., Univ. Kansas; from 3 mi. W Tala, 4300 ft., Jalisco, México; obtained on June 2, 1949, by J. R. Alcorn, original No. 9376.

Range.—North-central Jalisco; known from several localities in the vicinity of Tala.

Diagnosis.—Size large (see measurements); tail long, naked; hind foot small; color pale for species, upper parts Kaiser Brown (capitalized terms are of Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912), bases of individual hairs Plumbeous, tips Hazel, underparts creamy-white, bases of hairs Plumbeous; skull large, relatively narrow, rugose; zygomatic breadth narrower posteriorly than anteriorly; rostrum shallow, relatively broad in males, narrower in females; interorbital region broad; braincase narrow and flattened; basioccipital relatively wide, especially anteriorly; mastoid processes of squamosal large, knoblike; paroccipital processes long, extending laterally over more than half the width of mastoid bullae; upper incisors projecting anteriorly; maxillary teeth relatively large.

Comparisons.—From topotypes of *C. g. gymnurus* from Zapotlan, Jalisco, the most closely related subspecies, *C. g. tellus* differs in: Body smaller (total length averaging 338 instead of 341 in females and 356 instead of 369 in males); hind foot smaller (averaging 45 instead of 50 in females and 47 instead of 51 in males); color more brownish above, creamy-white rather than buffy below; skull smaller, especially in females (basilar length averaging 55.3 instead of 57.5 in females and 57.7 instead of 60.5 in males), narrower, and more rugose; zygomatic breadth less in females (averaging 42.5 compared with 46.2), greater in males (48.0 compared with 46.7); zygomata more nearly parallel; auditory bullae relatively smaller; mastoid processes of squamosal larger, knoblike; paroccipital processes longer, extending farther laterally; rostrum less massive; upper incisors projecting anteriorly, instead of being strongly recurved; maxillary teeth relatively larger.

From near-topotypes of *C. g. inclarus* from the Sierra Nevada de Colima, Jalisco, *C. g. tellus* differs in: Hind foot smaller; color paler brownish above in contrast to glossy black, creamy-white below rather than buffy, feet clothed with whitish instead of brownish hairs; skull larger (basilar length averaging 55.3 in females compared with 53.2, no males available for comparisons); zygomatic breadth less; nasals longer, extending posterior to front edge of anterior roots of zygomata rather than ending even with, or slightly behind, them; rostrum more massive; mastoid processes of squamosal larger; paroccipital processes extending farther laterally; upper incisors projecting anteriorly, rather than recurved; maxillary teeth larger (length of maxillary tooth-row averaging 14.6 compared with 13.3).

Close comparison with *C. g. imparilis* from Pátzcuaro, Michoacán, is not needed, *but C. g. tellus* differs especially in: Color of underparts and hairs of feet whitish rather than brownish; skull smaller; zygomatic breadth greater; interorbital constriction broader; nasals longer; maxillary tooth-row longer.

Measurements.—Averages of three adult females, including type, and the measurements of an adult male (in parentheses) from the type locality are: Total length, 338 (356); length of tail, 92 (87); length of hind foot, 45 (47); occipitonasal length of skull, 64.1 (68.7); basilar length, 55.3 (61.4); zygomatic breadth, 42.7 (48.0); interorbital breadth, 9.6 (11.4); greatest height of cranium, taken from palate perpendicular to line touching two highest points on top of skull, 23.9

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(25.3); least depth of rostrum, 10.6 (11.7); breadth of rostrum, 14.7 (16.5); length of nasals, 23.6 (25.2); width across mastoid processes of squamosal, 43.8 (49.7); height of occiput, 18.1 (19.9); length of maxillary tooth-row, 14.6 (15.2).

Remarks.—The distribution of *C. gymnurus* is spotty; its occurrence seemingly depends on edaphic conditions. The isolation of soils with textures suitable to this animal has resulted in the isolation of gopher populations. The distribution is similar to that of species occurring on islands. In this instance, however, the populations of gophers are separated by soils of heavy texture which render burrowing difficult or impossible for gophers. Such conditions have led to a high degree of subspeciation in a relatively short distance. For example, four subspecies of *C. gymnurus* occur in Jalisco, and, all are within an area scarcely fifty miles in diameter.

*Cratogeomys gymnurus tellus* is the northernmost subspecies of *C. gymnurus*. It is known from only the vicinity of Tala, west of Guadalajara, and its range probably is not much more extensive than this because of the localized distribution of suitable soils.

Specimens examined.—Total number ten, as follows: 3 mi. W Tala, type locality, 5; 1 mi. NE Tala, 3; 1 mi. S El Refugio, 2.

#### Cratogeomys gymnurus atratus new subspecies

Type.—Female, adult, skull and skin, No. 31880 Mus. Nat. Hist., Univ. Kansas; from Top of Cerro Viejo de Cuyutlán, 9700 ft., 19 mi. S and 9 mi. W Guadalajara, Jalisco, México; obtained on February 17, 1949, by J. R. Alcorn, original No. 7902.

Range.—Known only from the type locality on the Cerro Viejo.

Diagnosis.—Size small (see measurements); tail long; hind foot small; color dark, upper parts glossy Blackish Brown, bases of hairs Plumbeous, sides Chestnut Brown, underparts Pale Ochraceous-Buff or Warm Buff mixed with Plumbeous of the hair bases; skull small, lightly constructed, relatively deep; zygomata relatively weak; zygomatic breadth wider posteriorly than anteriorly; rostrum relatively wide, especially in males; nasals relatively long, truncate posteriorly; interorbital constriction narrow; braincase inflated; mastoid processes of squamosal only slightly wider than zygomatic breadth; auditory bullae relatively large; paroccipital processes weakly constructed, but extend laterally over half the width of mastoid bullae; upper incisors projecting anteriorly, rather than being strongly recurved; maxillary teeth small.

Comparisons.—From topotypes of *C. g. gymnurus* from Zapotlan, Jalisco, *C. g. atratus* differs in: Body smaller (total length averaging 300 in females compared with 341, a male measured 315 compared with an average of 363); tail shorter, hind foot smaller; color of upper parts darker, glossy Blackish-Brown rather than reddish brown, underparts paler; skull smaller (basilar length averaging 48.6 compared with 57.5, a male measured 50.0 compared with an average of 59.0); zygomata more weakly constructed; zygomatic breadth less, and wider posteriorly than anteriorly; braincase more inflated; nasals shorter; rostrum relatively narrower and shallower; width across mastoid processes of squamosals less; paroccipital processes less strongly constructed, extending farther laterally; upper incisors projecting anteriorly rather than being strongly recurved; maxillary teeth smaller (length of maxillary tooth-row averaging 11.2 compared with 14.9).

From *C. g. tellus*, that occurs to the northwest, *C. g. atratus* differs in: Body smaller; hind foot slightly smaller; upper parts darker; underparts Pale Ochraceous-Buff rather than creamy-white; skull smaller (see measurements); zygomatic breadth less, and wider posteriorly than anteriorly; nasals shorter, truncate posteriorly rather than emarginate; rostrum narrower and shallower; maxillary teeth smaller.

From near-topotypes of *C. g. inclarus* from the Sierra Nevada de Colima, *C. g. atratus* differs in: Body slightly smaller; hind foot smaller (averaging 42 compared with 49); color of upper parts near the same, underparts paler; skull smaller, narrower, weaker in construction; zygomatic breadth less; nasals relatively longer, but actually shorter (averaging 19.7 compared with 20.3); upper incisors projecting anteriorly rather than being recurved; maxillary teeth smaller.

Measurements.—The type and an adult female (its measurements in parentheses) yield measurements as follows: Total length, 300 (299); length of tail, 78 (83); length of hind foot, 43 (40); occipitonasal length of skull, 56.3 (55.5); basilar length, 49.3 (47.8); zygomatic breadth, 37.9 (36.5); interorbital breadth, 8.7 (8.1); greatest height of cranium, as explained above, 21.6 (20.7); least depth of rostrum, 9.2 (8.8); breadth of rostrum, 12.8 (12.7); length of nasals, 19.4 (20.0); width across mastoid processes of squamosal, 38.2 (37.1); height of occiput, 16.9 (17.3); length of maxillary tooth-row, 11.9 (11.3).

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Remarks.—Cratogeomys gymnurus atratus is the smallest subspecies known for the species, and is so distinct from other described subspecies, that it is difficult to select one as the closest relative. In color, C. g. atratus closely resembles C. g. inclarus, which occurs at comparable elevations in the Sierra Nevada, but the skulls are unlike. Among named subspecies of C. gymnurus, the skull of tellus most closely resembles that of atratus, and, although they differ greatly in size, C. g. tellus seems to be the closest relative of C. g. atratus.

This newly described subspecies is known only from Cerro Viejo and is probably restricted to the higher elevations on this mountain.

Specimens examined.—Seven, Top of Cerro Viejo de Cuyutlán, 19 mi. S and 9 mi. W Guadalajara.

#### Cratogeomys zinseri zodius new subspecies

*Type.*—Male, adult, skull and skin, No. 31879 Mus. Nat. Hist., Univ. Kansas; from 13 mi. S and 15 mi. W Guadalajara, Jalisco, México; obtained on February 6, 1949, by J. R. Alcorn, original No. 7747.

Range.—Known only from the type locality.

Diagnosis.—Size small (see measurements); tail short; hind foot small; upper parts Sayal Brown, underparts Pinkish Buff, hind foot whitish; skull small, narrow; outline of dorsal profile of skull concave; zygomatic breadth narrow; nasals actually short, but relatively long; width across mastoid processes of squamosal short; auditory bullae inflated; interorbital constriction narrow; maxillary teeth relatively large.

Comparisons.—From topotypes of *C. z. zinseri* from Lagos, Jalisco, *C. z. zodius* differs in: Body smaller (see measurements); tail shorter, hind foot smaller; upper parts dull brownish instead of reddish-brown, underparts paler, hairs of feet whitish instead of brownish; skull smaller, especially in females, narrower; dorsal profile of skull concave or flat (females) rather than convex; zygomatic breadth less; rostrum narrower and shallower; nasals actually shorter, but relatively longer in relation to length of skull; width across mastoid processes of squamosal shorter; maxillary teeth smaller.

Measurements.—The type and an adult male (his measurements in parentheses) yield measurements as follows: Total length, 318 (324); length of tail, 95 (89); length of hind foot, 41 (41); occipitonasal length of skull, 60.5 (59.1); basilar length, 52.4 (51.8); zygomatic breadth, 40.6 (39.0); interorbital breadth, 8.3 (8.8); greatest height of cranium, as explained above, 22.6 (22.4); least depth of rostrum, 11.2 (10.4); breadth of rostrum, 13.3 (13.9); length of nasals, 21.7 (21.2); width across mastoid processes of squamosal, 37.1 (36.8); height of occiput, 17.7 (17.9); length of maxillary tooth-row, 13.0 (13.3). A nearly adult female measured: Total length, 292; length of tail, 81; length of hind foot, 39; occipitonasal length of skull, 53.3; basilar length, 46.5; zygomatic breadth, 34.1; interorbital breadth, 7.8; greatest height of cranium, 21.0; least depth of rostrum, 9.8; length of nasals, 18.0; width across mastoid processes of squamosal, 32.2; depth of occiput, 15.9; length of maxillary tooth-row, 12.1.

Remarks.—This newly described subspecies is the smallest of known races of *C. zinseri*, and it is seemingly more closely related to *C. z. zinseri* than to the subspecies newly named below from the north end of Lago Sayula. The skulls of females are especially small and delicate in structure; the males are larger with more massive skulls. *C. z. zodius* is known to occur in the foot hills north of the Cerro Viejo, the mountain from which *C. g. atratus* was described above.

Specimens examined.—Seven, 13 mi. S and 15 mi. W Guadalajara.

#### Cratogeomys zinseri morulus new subspecies

*Type.*—Male, adult, skull and skin, No. 36679 Mus. Nat. Hist., Univ. Kansas; from N end Lago Sayula, 4400 ft., 9 mi. N and 2 mi. E Atoyac, Jalisco, México; obtained on March 23, 1950, by J. R. Alcorn, original No. 10889.

Range.—Known only from the type locality in central Jalisco.

Diagnosis.—Size large (see measurements); tail short; hind foot large; upper parts Fuscous-Black, strongly mixed with Walnut Brown, underparts Cinnamon-Buff, bases of all hairs Plumbeous; skull large, broad, rugose; outline of dorsal profile slightly concave, almost flat; zygomata strongly constructed, maxillary arm almost touching squamosal arm over jugal; wide across zygomata; nasals actually and relatively long; rostrum relatively narrow; auditory bullae inflated, relatively large; maxillary teeth relatively large.

Comparisons.—From topotypes of C. z. zinseri from Lagos, Jalisco, C. z. morulus

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differs in: Tail shorter (averaging 96 in females compared with 101, 94 in males compared with 115); color darker above, Fuscous-Black instead of Cinnamon-Rufous, underparts paler; skull larger (occipitonasal length 63.7 rather than averaging 58.5 in females and 68.6 rather than 63.1 in males); wide across zygomata; nasals actually and relatively longer; rostrum relatively narrower; wider across mastoid processes of squamosal; auditory bullae inflated, relatively larger; maxillary teeth larger.

From *C. z. zodius*, that occurs to the northeast, *C. z. morulus* differs in: Body larger (see measurements); hind foot larger; color of upper parts darker, underparts paler; skull much larger, broader, more rugose; dorsal profile of skull slightly concave rather than convex; wider across zygomata; nasals actually and relatively longer; rostrum broader, more massive; wider across mastoid processes of squamosal; auditory bullae larger; maxillary teeth larger.

Measurements.—The type and an adult female (her measurements in parentheses) from the type locality measure: Total length, 358 (338); length of tail, 94 (97); length of hind foot, 49 (45); occipitonasal length of skull, 68.6 (63.7); basilar length, 58.0 (55.6); zygomatic breadth, 49.3 (45.0); interorbital breadth, 9.6 (8.9); greatest height of cranium, as explained above, 26.1 (24.6); least depth of rostrum, 12.5 (10.8); breadth of rostrum, 14.5 (13.7); length of nasals, 25.9 (22.5); width across mastoid processes of squamosal, 47.7 (42.8); height of occiput, 19.8 (17.8); length of maxillary tooth-row, 13.9 (13.8).

Remarks.—Cratogeomys zinseri morulus is the darkest subspecies known of *C. zinseri*. It differs widely from other subspecies of this species in color and the large size of the skull.

Cratogeomys zinseri occurs over the same general area as C. gymnurus in central Jalisco, although these two species seemingly do not share the same local habitat. C. zinseri differs from C. gymnurus as follows: Tail relatively longer; skull wider across zygomatic arches than across mastoid processes of squamosal (reverse true in C. gymnurus); zygomata strongly bowed outward anteriorly; maxillary arm of zygomata almost touching squamosal arm (instead of widely separated from each other) above jugal; rostrum relatively narrower, less massive; border of nasals parallel or laterally swollen instead of gradually tapering.

Specimens examined.—Four, N end of Lago Sayula, 9 mi. N and 2 mi. E Atoyac.

Museum of Natural History, University of Kansas, Lawrence. Transmitted June 12, 1953.

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Transcriber's Notes:

Page 538: Changed lead to led (conditions have lead to a high degree).

\*\*\* END OF THE PROJECT GUTENBERG EBOOK FOUR NEW POCKET GOPHERS OF THE GENUS CRATOGEOMYS FROM JALISCO, MEXICO \*\*\*

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