

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES
FOURTH SERIES
VOL. IV, pp. 153-160. DECEMBER 30, 1914

VI
The Pocket Gopher of the Boreal Zone
on San Jacinto Peak

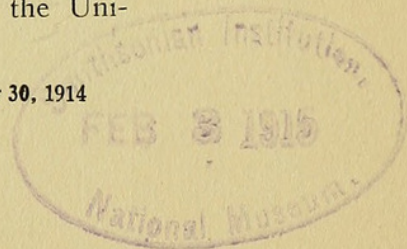
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In our report upon the birds and mammals of the San Jacinto area of southern California (Univ. Calif. Publ. Zool., Vol. 10, 1913, pp. 354-355) the twelve specimens of pocket gophers at that time available from the Boreal zone on San Jacinto Peak were referred to *Thomomys altivallis* Rhoads. That series contained not one adult male, and the possibility was suggested that, upon proper comparisons, differences would be found to exist whereby the species of San Jacinto Peak could be distinguished from that of the San Bernardino Mountains (*altivallis*). It will be recalled that the San Jacinto and San Bernardino mountain masses are separated only by the narrow, though deep, San Gorgonio Pass. The latter is cut to such a depth as to be traversed by a tongue of the Lower Sonoran zone, yet so steep are the confining walls that the nearest limits of the boreal areas of the separated mountain masses are only about seventeen miles apart.

In order to clear up the relationships of the San Jacinto gopher, opportunity was taken by the junior author, in September, 1914, to revisit San Jacinto Peak, with the result that seven more specimens were obtained, four of which are adult males. With this additional material we now find good grounds for nomenclatural separation of the San Jacinto and San Bernardino mountain gophers, and also for further discussion of relationships.

*Contributed from the Museum of Vertebrate Zoology of the University of California.

December 30, 1914



Thomomys jacinteus, new species.

San Jacinto Gopher

Type.—Male, adult; No. 21235, Mus. Vert. Zool.; Round Valley, 9000 feet altitude, San Jacinto Mountains, Riverside County, California; September 15, 1914; collected by H. S. Swarth; orig. No. 10012.

Diagnosis.—A *Thomomys* of the *alpinus* group of species. Size medium; coloration dark; skull long and narrow, but faintly ridged, and with relatively straight top in lateral profile.

Material.—Nineteen skins-with-skulls from San Jacinto Peak: Nine (Nos. 21229-21235, 1761, 1762) from Round Valley, 9000 feet altitude; ten (Nos. 2188-2197) from Tahquitz Valley, 8000 feet altitude. Of these, nine are obviously young; seven are males, twelve are females.

Comparisons.—As compared with topotypes of *Thomomys altivallis* Rhoads, its nearest relative geographically, the new species is decidedly smaller in general size (see accompanying tables of measurements), the tone of coloration is slightly browner, there is more or less white about the face, the whole skull is much narrower (except for interorbital constriction), there is less of angulation and ridging, the nasals are shorter, and the dorsal outline is more nearly straight in lateral profile. From *Thomomys neglectus* Bailey, from the San Gabriel Mountains, as originally described (Proc. Biol. Soc. Wash., Vol. 27, 1914, p. 117), *jacinteus* evidently differs notably in much less blackish coloration, in presence of more or less white about the face, and in less elongated and straight-topped skull. From topotypes of *Thomomys alpinus* Merriam, from the Mount Whitney region, *jacinteus* differs in decidedly browner and darker, less grayish, coloration, in much less squarely spreading zygomatic arches, in narrower braincase, and in shorter and posteriorly less attenuated nasals. From the species of gopher on the immediately adjacent lower slopes of San Jacinto Peak (*T. nigricans* Rhoads, of Upper Sonoran and low Transition), *jacinteus* differs in decidedly larger general size and notably larger ears and front feet, in

much less reddish-brown tone of coloration, in more or less white marking about the face, in heavier dentition, in larger and especially more elongated auditory bullæ, in wider inter-orbital constriction, in less widely spreading zygomatic arches, and in more nearly straight dorsal outline of skull in lateral profile.

Taking all characters into consideration, there appear to be more in common between *jacinteus* and *alpinus* than between *jacinteus* and *altivallis*. Out of the entire series of *jacinteus*, both adults and young, eleven have much white on chin and lining of cheek-pouches, as in *alpinus*; the rest all show white in lining of cheek-pouches, at least. *Altivallis* has a blackish brown face, rarely showing white, even within the cheek-pouches.

Relationships and Ecology.—The habitats of the several species of *Thomomys* occurring in the San Jacinto Mountains seem to be constituted mainly by the several valleys comprising areas of varying size throughout the range. Thomas (or Hemet), Strawberry, Tahquitz, and Round valleys are the more important of the stretches of comparatively open and level country of the higher parts of the mountains; and while gophers also occur in limited numbers along some of the streams connecting these sections, as well as on many of the dry and rather open pine-covered ridges, still the meadowlands in each of these valleys may be considered as the centers of abundance and radial dispersal of the gophers of these mountains. The densely brush-covered slopes surrounding the lower valleys offer poor inducements to the species, and the animals are seldom found in such places.

The three higher valleys of San Jacinto Peak, Strawberry Valley at 6000 feet, Tahquitz Valley at 8000 feet, and Round Valley at 9000 feet, form a series of terraces on the sides of the mountain. In these mountain valleys the soil is deep and rich, in many places supporting a dense growth of grasses, and sometimes so saturated with water as to form acres of wet bog, altogether making most favorable surroundings for gophers. In striking contrast, the valleys' edges are sharply defined by steep, rocky slopes, these in the higher portions of the range frequently forming series of bare cliffs, in the lower parts steep, gravelly hillsides, densely covered with chaparral.

Many portions of these breaks in the topography are sufficiently marked to suggest their actual service as physical barriers to the dispersal of animals having the sedentary habits of gophers. Especially is this the case between Strawberry and Tahquitz valleys, where lies the dividing line between *nigricans* and *jacinteus*. It will be noted that Tahquitz and Round valleys, as well as the country lying directly between, the entire habitat of *jacinteus* in fact, is on the eastern slope of San Jacinto Peak, with all drainage toward the desert. Strawberry Valley, together with the rest of the habitat of *nigricans* in these mountains, is west of the divide. There are no streams connecting the higher valleys with Strawberry Valley and the slopes to the westward, streams which with their narrow margins of favorable surroundings would offer means of dispersal for these animals. Also the slopes intervening are so steep and rocky as apparently to preclude the possibility of uninterrupted distribution without some such passage ways (see Univ. Calif. Publ. Zool., Vol. 10, plate 8, fig. 1).

This latter condition also prevails on the eastern side of the mountain, where the series of tremendous, rocky precipices descending abruptly to the desert forms an effective barrier, in all probability extending from the habitat of the boreal *jacinteus* to that of the Lower Sonoran *perpallidus* of the floor of the desert below. So altogether it seems probable that *Thomomys jacinteus* is absolutely separated from those forms geographically nearest to it by the physical conditions surrounding its habitat.

Between Tahquitz and Round valleys there is no abrupt break. Although at the eastern edge of Round Valley there is nearly as steep and rocky a cliff as between Tahquitz and Strawberry valleys, the approach from Tahquitz Valley to Hidden Lake, and thence to Round Valley, is gradual, and gopher sign was seen continuously over the whole distance. In accounting for the occurrence of *nigricans* in Strawberry Valley, in common with the lower Thomas Valley and the country to the southward, there is no difficulty, for while Strawberry Valley occupies a sharply defined terrace, with steep slopes below, the connecting streams with their adjacent congenial margins are probably sufficient to explain the general dispersal of this species of gopher.

As the structural peculiarities of *jacinteus* point to close affinities with other boreal species from distant mountains, rather than with the geographically nearer low-zone species of the same mountain mass, there is, of course, no need for invoking a theory of isolation from *nigricans* to account for the occurrence of the former on San Jacinto Peak. It is, however, of decided interest to note the probable existence of associational barriers to the dispersal of an animal with the habits of the gopher, along the exact line where division between *jacinteus* and *nigricans* appears to be. While these barriers may have had nothing to do with the origin of either species, they may well be the sole prevention of the wider dispersal of either one of them, which, if it had been freely possible, might have resulted in competitive displacement of the other.

The summer of 1914 had been an unusually dry one in the San Jacinto Mountains, where this season of the year is generally accompanied by frequent thunder showers; and in the lower parts of the range the dryness had the effect of entirely stopping the gophers from any active digging. In Strawberry Valley, during two weeks, no freshly thrown-out earth was seen, though *Thomomys nigricans* is an abundant inhabitant of the valley, and old mounds could be observed everywhere. It was evident, however, that the cessation of digging activities by the animals was by no means an indication that they were in a dormant condition similar to hibernation. A house cat belonging to an acquaintance in the camp caught gophers frequently, sometimes two in a night.

Trapping here was not promising, however, for there was no way of telling which entrances were in use; so it was a relief to find that conditions were somewhat different in the higher valleys where *jacinteus* occurs. The several large meadows occupying the centers of Tahquitz and Round valleys are so saturated with water that even in a dry summer parts of them remain boggy. About these wet meadows the gophers were most abundant. No trapping was done in Tahquitz Valley during the visit of September, 1914, and but a cursory investigation of conditions was made; but several fresh mounds were noted near the edges of the meadow and on the adjacent dry ridges.

In Round Valley, September 13, 14 and 15, gophers were found to be working actively, though in a rather limited area. The meadow here is about two hundred yards across, and about a quarter of a mile in length, and the gophers occupied a narrow belt surrounding this area. They worked down toward the center as far as the water permitted, but not far into the dry woods of the higher surrounding ridges. Fresh mounds were also noted along the margins of the stream flowing out of the valley, at various points along this and other small streams between Round Valley and Hidden Lake, and between Hidden Lake and Tahquitz Valley. These fresh workings, however, were always near water, where there was a little green growth. No gopher sign was noted on the steep slopes between Round Valley and the summit of San Jacinto Peak. Here, as elsewhere, it seemed evident that such stony ground is impassable to the animals.

The burrows in Round Valley were of noticeably small size, a condition possibly produced by the dryness and consequent hardness of the ground. The occupied holes were all in grassy areas, and the green grass seemed to be the principal food plant sought. Cut grass was found in several of the holes. Of the seven animals taken at this point, four were caught in the middle of the day. The other three may also have been captured after daylight, as the traps were not inspected until some time after dawn. Evidently they were working actively during the day.

MEASUREMENTS IN MILLIMETERS OF NINE ADULTS OF
THOMOMYS ALTIVALLIS

Mus. No.	Sex	Total length	Tail vertebrae	Hind foot	Occipito-nasal length of cranium	Zygomatic width	Mastoid width	Inter-orbital constriction	Length of nasals
4546	♂	267	85	36	48.6	30.2	24.8	6.0	17.5
4543	♂	256	80	36	48.2	30.7	25.0	6.3	16.8
4601	♂	265	83	36	47.8	31.6	25.2	5.9	17.0
4599	♂	249	82	34	47.2	28.4	22.8	6.8	17.7
4592	♀	232	75	31	42.7	25.7	21.8	6.6	15.7
4568	♀	215	73	31	40.8	25.7	20.6	7.0	14.2
4587	♀	223	63	30	41.1	25.9	20.6	6.9	14.1
4554	♀	203	65	31	39.5	24.9	20.0	7.0	12.6
4593	♀	219	62	32	38.4	22.4	19.7	6.8	13.0

MEASUREMENTS IN MILLIMETERS OF NINE ADULTS OF
THOMOMYS JACINTEUS

Mus. No.	Sex	Total length	Tail vertebrae	Hind foot	Occipito-nasal length of cranium (1)	Zygomatic width	Mastoid width (2)	Inter-orbital constriction	Length of nasals
21235	♂	240	82	32	43.5	25.0	20.3	6.1	15.0
21230	♂	231	76	30	41.0	24.9	19.3	6.4	14.0
21229	♂	234	80	31	39.1	24.8	19.7	6.5	14.4
21232	♂	218	75	28	36.3	21.4	18.6	5.8	11.1
21231	♀	219	77	28	38.3	22.9	18.9	6.2	12.8
2193	♀	230	80	30	39.6	22.6	18.7	6.5	12.7
2188	♀	220	71	30	38.6	22.5	18.4	6.5	13.2
2190	♀	210	65	29	38.6	23.3	18.4	6.6	12.5
1762	♀	209	69	29	38.0	21.7	17.7	6.4	13.3

(1) Measured over-all from anterior tips of nasals to most posterior points on occipital end of cranium, which are usually the condyles.

(2) Greatest breadth behind zygomatic arches; sometimes pertains to auditory tubes, sometimes the lateral protuberances of mastoids; often the parallel dividers touch both.



Grinnell, Joseph and Swarth, Harry S. 1914. "The pocket gopher of the boreal zone on San Jacinto Peak." *Proceedings of the California Academy of Sciences, 4th series* 4, 153–160.

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