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NEW KANGAROO MICE, GENUS *MICRODIPODOPS* (RODENTIA: HETEROMYIDAE), FROM IDAHO AND NEVADA

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Abstract.—Two new subspecies of kangaroo mice (*Microdipodops*) are described from the Great Basin region of North America: *M. megacephalus atrirelictus* from southwestern Idaho and *M. pallidus restrictus* from southwestern Nevada. The single known population of *atrirelictus* is isolated from other populations of kangaroo mice by over 100 km of unsuitable habitat and constitutes the first record of the genus in the state. This taxon is large in most cranial and external measurements, extremely dark in dorsal pelage color, and is characterized by the 40-β (40 chromosomes, totally biarmed autosomes) karyotype. The subspecies *restrictus,* known only from the type-locality, is small in most cranial characters and has the 42-α (5 pairs of acrocentric autosomes) karyotype. This new subspecies of *M. pallidus* exhibits a karyotype similar to *M. p. pallidus,* and a morphology like that of *M. p. ruficollaris.* Moreover, both subspecies described herein show a level of biochemical differentiation that is in accord with their high degree of morphological and chromosomal distinctiveness.

Kangaroo mice (genus *Microdipodops*) belong to one of the most morphologically heterogeneous groups of mammals: the rodent superfamily Geomyoidea. This superfamily is autochthonous in North America and comprises a diverse assemblage of forms including those which are fossorial herbivores (pocket gophers; family Geomyidae) and those which are either quadrupedal (scansorial) or bipedal (richochetal) granivores (kangaroo mice, kangaroo rats, pocket mice and spiny pocket mice; family Heteromyidae). The genus *Microdipodops* was described by Merriam in 1891 and was immediately recognized as a bizarre form even in the context of such a heterogeneous assemblage. Kangaroo mice are tiny, bipedal rodents with enormous heads and large, furry hind feet. Indeed, *Microdipodops* shows the greatest relative head size (head size : body size) known among mammals extant or extinct.

In comparison with other geomyoid genera, the genus *Microdipodops* contains few species and occupies a very small geographic range. Only two species of kangaroo mice are recognized, *M. megacephalus* and *M. pallidus,* and both are desert-adapted forms which are restricted in distribution to the Great Basin Desert region (Hall 1941; Hafner *et al.* 1979; Hafner 1981). Kangaroo mice are not distributed ubiquitously across the Great Basin, but occur in a highly dissected manner reflecting largely their predilection for aeolian soils. In the course of field work for an evolutionary study of kangaroo mice (Hafner 1981), two new forms were identified, each from disjunct and geographically isolated areas. The new *Microdipodops* taxa include a subspecies of *M. megacephalus* from extreme southwestern Idaho and one of *M. pallidus* from southwestern Nevada. Kangaroo mice heretofore were unreported from Idaho (Davis 1939). Hence, the known geo-

graphic distribution of *M. megacephalus* now spans the broad bounds of the Great Basin region and includes principally Nevada and its neighboring states of California, Oregon, Idaho, and Utah. The distribution of *M. pallidus,* in contrast, is confined to Nevada and the eastern margins of California.

Methods and Materials

Morphological considerations.—The specimens described herein were compared with geographically adjacent forms (subspecies taxonomy follows Hafner 1981). In total, five populations were sampled for comparison with the new Idahoan kangaroo mice, and two samples were selected for comparison with the new *M. pallidus* form from southwestern Nevada. Morphological differentiation among the nine samples was assayed by examination of a battery of cranial morphometric characters and pelage colorimetric variables in adult specimens of kangaroo mice. The criterion for selecting adult specimens for the cranial morphometric portion of the analysis included presence of extensive wear on the permanent fourth upper premolar. All specimens used in the colorimetric analyses showed adult dorsal pelage coloration. In the computation of statistics sexes were pooled inasmuch as kangaroo mice are known to lack secondary sexual differences in the characters under study (Hall 1941, 1946; Schitoskey 1968; Hafner 1976). Sixteen cranial measurements (in mm) were taken with dial calipers: greatest length of skull, greatest breadth (across mastoids), basal length, bullar length, maxillary breadth, nasal length, least interorbital breadth, greatest expanse of lateral face of zygoma (width of zygomatic process of maxilla), least expanse of lateral face of zygoma (taken at the maxillary base of zygoma), greatest length incisive foramina, length incisive foramina at point of greatest breadth (a measure of the posterior foraminal divergence taken from the anterior margin of incisive foramina), greatest breadth incisive foramina, greatest pterygoidal breadth (across distal end of one pterygoid), arching of cranial dome (from the dorsal margin of the foramin magnum to a line tangential to the nasal-frontal plane), mandibular length, and angular bifurcation (a measure of the expansion of the wings of the angular process of the dentary; see Hafner *et al.* 1979). Variation in mid-dorsal pelage coloration was measured using a Bausch and Lomb Spectronic 505 Spectrophotometer. Three colorimetric variables were computed from reflectance curves: relative brightness (=value), dominant wavelength (=hue), and excitation purity (=chroma or saturation). A full description of the characters and methods of taking and recording data is presented elsewhere (Hafner 1981). Holotypic specimens described herein were prepared following the skin-plus-skeleton technique (Hafner *et al.* 1984).

Protein electrophoresis.—Biochemical variation was examined in samples representing all subspecies under study except *M. m. nexus.* Polyacrylamide gel electrophoresis was used to examine patterns of variation in plasma proteins and nonspecific esterases. This technique, which focuses on "rapidly evolving" proteins, allows for higher resolution at the lower taxonomic levels than does the conventional starch gel (specific-staining) approach. Following electrophoretic separation, the gels were treated according to electrophoretic procedures for general staining. Thirty-two protein bands (presumptive loci) were analyzed and individuals were compared and scored for similarity (*S*) to assess degree of biochemical differentiation. A full description of this technique and its application to *Microdipodops* systematics is given elsewhere (Hafner 1981).

Chromosomal analysis.—The karyotypes of two specimens of *M. p. restrictus* (including the holotype) and one specimen of *M. m. atrirelictus* (the holotype) were compared with those of all other named forms of *Microdipodops* (Hafner 1981). Non-preferentially stained karyotypes were prepared using a modification of Patton's (1967) in vivo bone marrow technique. Terminology and chromosomal descriptions follow Hafner (1981). All karyotypic preparations are deposited as voucher material in the Museum of Vertebrate Zoology, University of California, Berkeley.

Comparative material examined.—All study specimens used for comparison with the new subspecies are deposited in the Museum of Vertebrate Zoology (MVZ). The five *M. megacephalus* samples chosen are as follows: *M. m. oregonus,* 2 mi. S Borax Spring, S end Lake Alvord, 4300 ft., Harney Co., Oregon; *M. m. ambiguus,* 1¼ mi. N Sulphur, 4050 ft., Pershing Co., Nevada; *M. m. californicus,* 7 mi. N Winnemucca, 4600 ft., Humboldt Co., Nevada; *M. m. nexus,* 3 mi. S Inzenhood, Lander Co., Nevada; and *M. m. megacephalus,* 22.8 mi. N, 3.6 mi. W Eureka, 5850 ft., Eureka Co., Nevada, and 4 mi. SE Romano, Diamond Valley, Eureka Co., Nevada. The two *M. pallidus* samples selected include: *M. p. pallidus,* Mountain Well, 5600 ft., Churchill Co., Nevada; and *M. p. ruficollaris,* 2½ mi. S Lock's Ranch, 3¼ mi. S Lock's Ranch, 9 mi. S Lock's Ranch, and Able Spring, 12½ mi. S Lock's Ranch, Railroad Valley, 5000 ft., Nye Co., Nevada. Sample sizes are given below and in Tables 1 and 2. These samples, except those of *californicus* and *megacephalus,* represent type or near-type localities for each of the subspecies.

Microdipodops megacephalus atrirelictus, new subspecies

Holotype.—Adult female; skin, skull, skeleton (appendicular elements complete on left side only), frozen tissue, karyotype: MVZ 160039; coll. 8 Oct 1978, John C. Hafner; original number 1428; condition good.

Type-locality.—11 mi. S, 44.2 mi. W Riddle, 5000 ft., Owyhee Co., Idaho.

Distribution.—Known only from the immediate vicinity of the type-locality in extreme southwestern Idaho (southwestern Owyhee County) near the boundaries of Oregon and Nevada.

Measurements of the holotype.—Morphometric data for the holotype including external measurements (transcribed from the specimen tag) and cranial characters are as follows: total length, 169; tail length, 93; hind foot, 26; ear, 12; greatest length of skull, 29.27; greatest breadth, 19.16; basal length, 19.06; bullar length, 14.60; maxillary breadth, 11.62; nasal length, 10.35; least interorbital breadth, 6.69; greatest expanse of lateral face of zygoma, 1.32; least expanse of lateral face of zygoma, 0.94; greatest length of incisive foramina, 2.19; length incisive foramina at point of greatest breadth, 1.52; greatest breadth of incisive foramina, 0.73; greatest breadth of pterygoids, 0.61; arching of cranial dome, 6.49; mandibular length, 10.85; and angular bifurcation, 0.36.

Diagnosis and description.—These kangaroo mice are the largest in general body size and darkest in dorsal pelage color of all known populations of *M. megacephalus.* With respect to cranial measurements (Table 1), *atrirelictus* is particularly large in greatest breadth of skull, basal length, bullar length and mandibular length. The dorsal aspect of the skull is relatively flat and the nasals are short. The incisive foramina are short, narrow, and nearly parallel sided (not diverging

Table 1.—Mean values of cranial variables for selected samples of *Microdipodops* (2 SE and N shown in parentheses). Measurements are in millimeters.

Subspecies	Greatest length	Greatest breadth	Basal length	Bullar length
		Microdipodops megacephalus		
atrirelictus	28.705 (.635, 4)	19.325 (.121, 4)	18,598 (.466, 4)	14.715 (.251, 4)
oregonus	28.257 (.268, 11)	18.587 (.328, 11)	18.275 (.230, 10)	14.103 (.298, 11)
ambiguus	28.864 (.292, 11)	19.237 (.280, 11)	18.382 (.198, 11)	14.845 (.240, 11)
californicus	28.729 (.290, 12)	18.933 (.258, 12)	18.441 (.210, 12)	14.304 (.182, 12)
nexus	28.750 (.234, 12)	19.392 (.172, 12)	18.291 (.188, 9)	14.827 (.180, 12)
megacephalus	28.435 (.342, 12)	18.862 (.222, 12)	18.444 (.280, 12)	14.567 (.188, 12)
		Microdipodops pallidus		
restrictus	28.380 (.332, 7)	19.417 (.222, 7)	18.289 (.158, 7)	14.464 (.208, 7)
pallidus	28.774 (.354, 14)	19.548 (.326, 14)	18.428 (.234, 12)	14.624 (.250, 14)
ruficollaris	28.400 (.444, 8)	19.452 (.436, 8)	18.173 (.306, 7)	14.640 (.286, 8)

Subspecies	Maxillary breadth	Nasal length	Least interoribital breadth	Greatest expanse of lateral face of zygoma
		Microdipodops megacephalus		
atrirelictus	11.790 (.211, 4)	9.875 (.388, 4)	6.595 (.073, 4)	1.420 (.067, 4)
oregonus	11.819 (.154, 11)	10.202 (.192, 11)	6.866 (.092, 11)	1.575 (.054, 11)
ambiguus	11.616 (.196, 11)	10.027 (.146, 11)	6.571 (.098, 11)	1.517 (.068, 11)
californicus	11.709 (.208, 12)	10.266 (.192, 12)	6.513 (.100, 12)	1.472 (.072, 12)
nexus	11.524 (.192, 12)	9.997 (.134, 12)	6.498 (.092, 12)	1.464 (.096, 11)
megacephalus	11.649 (.118, 12)	9.788 (.152, 12)	6.640 (.072, 12)	1.387 (.092, 12)
		Microdipodops pallidus		
restrictus	11.917 (.310, 7)	9.991 (.282, 7)	6.623 (.134, 7)	1.479 (.084, 7)
pallidus	12.132 (.208, 13)	10.117 (.168, 14)	6.741 (.106, 14)	1.542 (.068, 14)
ruficollaris	12.155 (.274, 8)	9.692 (.118, 8)	6.838 (.084, 8)	1.538 (.050, 8)

Subspecies	Least expanse of lateral face of zygoma	Greatest length incisive foramina	Length incisive foramina at point of greatest breadth	Greatest breadth incisive foramina
		Microdipodops megacephalus		
atrirelictus	1.013 (.086, 4)	2.325 (.117, 4)	1.713 (.133, 4)	0.858 (.105, 4)
oregonus	1.135 (.064, 11)	2.531 (.058, 11)	2.035 (.086, 11)	1.098 (.066, 11)
ambiguus	1.135 (.066, 11)	2.515 (.094, 11)	2.040 (.072, 11)	0.980 (.078, 11)
californicus	1.185 (.078, 12)	2.359 (.052, 12)	1.822 (.080, 12)	0.990 (.036, 12)
nexus	1.023 (.074, 12)	2.434 (.072, 12)	1.950 (.064, 12)	0.960 (.042, 12)
megacephalus	0.981 (.086, 12)	2.412 (.078, 12)	1.915 (.096, 12)	1.050 (.068, 12)
		Microdipodops pallidus		
restrictus	1.126 (.058, 7)	2.239 (.098, 7)	1.584 (.220, 7)	0.954 (.044, 7)
pallidus	1.044 (.048, 14)	2.353 (.072, 14)	1.156 (.214, 14)	0.918 (.036, 14)
ruficollaris	1.234 (.034, 8)	2.354 (.072, 8)	1.371 (.122, 8)	1.023 (.060, 8)

Subspecies	Greatest pterygoidal breadth	Arching of cranial dome	Mandibular length	Angular bifurcation
		Microdipodops megacephalus		
atrirelictus	0.718 (.076, 4)	6.320 (.145, 4)	10.638 (.274, 4)	0.403 (.039, 4)
oregonus	0.757 (.040, 10)	6.433 (.222, 11)	10.440 (.066, 11)	0.329 (.022, 11)
ambiguus	0.737 (.070, 10)	6.688 (.212, 11)	10.292 (.106, 11)	0.267 (.040, 11)
californicus	0.772 (.062, 12)	6.474 (.144, 12)	10.512 (.124, 12)	0.321 (.050, 12)
nexus	0.745 (.080, 8)	6.419 (.166, 12)	10.317 (.126, 12)	0.436 (.032, 12)
megacephalus	0.705 (.044, 11)	6.482 (.208, 12)	10.409 (.102, 12)	0.286 (.026, 12)
		Microdipodops pallidus		
restrictus	0.856 (.040, 7)	6.960 (.272, 7)	10.509 (.146, 7)	0.469 (.070, 7)
pallidus	0.974 (.044, 12)	6.971 (.200, 14)	10.761 (.126, 14)	0.494 (.032, 14)
ruficollaris	0.979 (.056, 8)	6.905 (.188, 8)	10.586 (.242, 8)	0.534 (.054, 8)

Table 2.—Mean values of colorimetric variables for selected populations of *Microdipodops* (2 SE shown in parentheses). Relative brightness and excitation purity are given in per cent and dominant wavelength is in millimicrons.

Subspecies	N	Relative brightness	Dominant wavelength	Excitation purity
		Microdipodops megacephalus		
atrirelictus	5	58.984 (0.806)	576.600 (1.624)	.037 (.006)
oregonus	19	58.387 (0.802)	577.737 (0.730)	.049 (.004)
ambiguus	19	72.122 (1.668)	580.579 (0.232)	.104 (.004)
californicus	20	71.165 (1.308)	580.500 (0.308)	.104 (.004)
nexus	19	64.054 (0.892)	579.842 (0.382)	.082 (.004)
megacephalus	19	60.327 (2.894)	577.316 (1.082)	.050 (.006)
		Microdipodops pallidus		
restrictus	7	76.877 (1.808)	581.000 (0.618)	.099 (.008)
pallidus	20	75.709 (1.456)	581.350 (0.218)	.119 (.004)
ruficollaris	17	74.901 (1.282)	580.118 (0.890)	.101 (.004)

posteriorly). Chromosomally, *atrirelictus* has a diploid number of 40 and a fundamental number (autosomal arm number) of 76; this is the 40-β karyotype (Hafner 1981), which has all biarmed autosomes. The dorsal pelage of *atrirelictus* is dark and registers relatively low values for excitation purity (Table 2). The pelage of the tail dorsum is black from base to tip. The ventral pelage is characterized by having distinct plumbeous bases on the belly hair.

Comparisons.—From *oregonus, ambiguus,* and *megacephalus,* this subspecies differs in having the 40-β karyotype (and not the 40-α karyotype with the characteristic small pair of acrocentric autosomes; see Hafner 1981), larger overall body size, greater cranial measurements (e.g., greatest breadth, basal length, and mandibular length), and darker dorsal pelage color (Tables 1 and 2). Kangaroo mice from Idaho, although sharing the 40-β karyotype with *californicus* (Hafner 1981), differ from that subspecies in having darker dorsal pelage, larger body size and cranial measurements, and plumbeous bases on the hairs of the venter (instead of pure white belly hairs). From *nexus,* whose karyotype is unknown, *atrirelictus* is also readily distinguished by its larger size (particularly basal length and mandibular length) and darker pelage (Tables 1 and 2).

Comments.—This new subspecies from Idaho is among the most highly differentiated infraspecific taxa in *Microdipodops.* Attendant with the high degree of morphological distinctness of *atrirelictus,* is its great extent of protein electromorphic divergence (Hafner 1981). Analysis of protein electrophoregrams reveals that *atrirelictus* represents a singular genetic subcluster within *M. megacephalus* (overall genetic similarity between *atrirelictus* and other *M. megacephalus* populations is low [$\bar{S} = 0.60$]; see Hafner 1981). Moreover, among all known *M. megacephalus* populations, *atrirelictus* possesses a unique combination of three characters: nearly black dorsal pelage, plumbeous bases to the hairs of the venter, and the 40-β karyotype.

These kangaroo mice are isolated near the East Little Owyhee River region and are well separated from other known populations of kangaroo mice by over 100 km of apparently unsuitable habitat. In consideration of the morphological and genetic distinctness of *atrirelictus* and its marginal geographic position (actually

lying just outside the northern bounds of the hydrographically defined Great Basin), it appears that these kangaroo mice represent a relictual distributional islet of *M. megacephalus.* Further, the genetic and morphological information argue against the notion that the Idahoan mice represent a very recent immigrant into the Owyhee region.

The environs about the general vicinity of the type-locality are atypical for kangaroo mice; the area is extremely rocky, much of the region is steeply dissected by canyons and the soil is generally alkali-caked or gravelly. Notwithstanding this, the holotype was collected on a sandy strandline along the course of a dry arroyo which funnels into the East Little Owyhee River. Here the floral association included *Artemisia, Tetradymia,* and scattered clumps of perennial grasses, including *Oryzopsis,* and was similar to typical *M. megacephalus* habitat (Fig. 1). The other specimens of *atrirelictus* were collected above the type locality on the sagebrush flats immediately to the west (John A. White, pers. comm.). The form *atrirelictus* is not common locally and is known from only five specimens. Indeed, the holotype was the only kangaroo mouse taken at the type-locality out of a total of 410 trapnights.

Specimens examined.—In addition to the holotype, one juvenile (skin in molt) and three adults were examined (all from the near vicinity of the type-locality). The last four specimens (all from the same general locality; John A. White, pers. comm.) are deposited in the Idaho Museum of Natural History, Idaho State University (specimen tags bearing IMNH or ISU numbers) as follows: ½ mi. N Nevada, 2½ mi. E Oregon, Owyhee Co., Idaho (693, 694 IMNH); Starr Valley, NW ¼ Section 19, T16S, R5W, B.M., Owyhee Co., Idaho (259 IMNH); Near Starr Valley, NW ¼, NW ¼ Section 19, T16S, R5W, B.M., Owyhee Co., Idaho (R-526 ISU).

Etymology.—The subspecific epithet is derived from the Latin root *atr,* meaning black, and *relict,* meaning left behind. This name was selected to express both the distinctive morphological and historical biogeographical attributes of the new subspecies.

Microdipodops pallidus restrictus, new subspecies

Holotype.—Adult male; skin, skull, skeleton (appendicular elements present on left side only), frozen tissue, and karyotype: MVZ 159970; coll. 2 Aug 1979, John C. Hafner; original number 1463; condition good.

Type-locality.—8.9 mi. S, 1.2 mi. E Mina, 4400 ft., Mineral Co., Nevada.

Distribution.—Known only from type-locality. This population seems to be restricted to a small distribution in Soda Spring Valley at the southern end of Rhodes Salt Marsh, and isolated from surrounding populations of *M. pallidus* in Mineral County.

Measurements of the holotype.—External measurements (taken from the specimen label) and cranial morphometric characters for the holotype are as follows: total length, 158; tail length, 89; hind foot, 25.5; ear, 12; greatest length of skull, 28.01; greatest breadth, 19.53; basal length, 18.32; bullar length, 14.53; maxillary breadth, 12.49; nasal length, 10.14; least interorbital breadth, 6.59; greatest expanse of lateral face of zygoma, 1.68; least expanse of lateral face of zygoma, 1.22; greatest length incisive foramina, 2.23; length incisive foramina at point of greatest breadth, 1.76; greatest breadth incisive foramina, 1.03; greatest breadth ptery-

Fig. 1. Type-locality of *Microdipodops megacephalus atrirelictus*: 11 mi. S, 44.2 mi. W Riddle, 5000 ft., Owyhee Co., Idaho. This view, facing north, illustrates the general topography of the area. The holotype was collected near a sandy wash (center of photograph), whereas other specimens were collected in seemingly less-favorable habitat on the mesas to the west.

goids, 0.76; arching of cranial dome, 6.28; mandibular length, 10.38; and angular bifurcation, 0.58.

Diagnosis and description.—Kangaroo mice of this subspecies are small in overall cranial measurements, including: greatest length of skull, bullar length, maxillary breadth, and greatest length of incisive foramina (Table 1). Further, in *restrictus* the ratio between the least and greatest expanse of the lateral face of the zygoma is large (see Table 1), which reflects a lesser relative development of a "zygomatic plate" along the zygoma. Also, the pterygoids are narrow and the nasals are short. With respect to colorimetric characters, this subspecies is characterized by having a small value for excitation purity of the dorsal pelage (Table 2). Chromosomally, *restrictus* has the 42-α karyotype (Hafner 1981), which has 42 chromosomes and a fundamental number of 70 (five pairs of acrocentric autosomes).

Comparisons.—Cranial and colorimetric variables of *restrictus* and the only other two subspecies, *pallidus* and *ruficollaris* (Hafner 1981), are presented in Tables 1 and 2. From *pallidus,* (the main western subspecies that largely surrounds *restrictus* in distribution), *restrictus* differs in having shorter nasals, larger measurements for the least expanse of lateral face of zygoma and smaller values for excitation purity of the dorsal pelage. Kangaroo mice of the subspecies *restrictus* differ from *ruficollaris* (the eastern *M. pallidus* subspecies) in having the 42-α

Fig. 2. Type-locality of *Microdipodops pallidus restrictus*: 8.9 mi. S, 1.2 mi. E Mina, 4400 ft., Mineral Co., Nevada. Kangaroo mice of this subspecies are found on and immediately about these semi-stabilized sand dunes (view is facing north).

karyotype instead of the 42-β (totally biarmed autosomes; see Hafner 1981) karyotype.

Comments.—The form *restrictus,* although distributed in the western portion of the species' range, is morphologically unlike the other western subspecies, *pallidus,* and remarkably similar to *ruficollaris* of the east. Interestingly though, *restrictus* differs markedly in karyotype from the eastern subspecies and possesses the same karyotype found throughout the majority of the range of *pallidus.* Hence, *restrictus* combines characters found in both of these other forms. In addition to the morphological and chromosomal differentiation of *restrictus,* this new subspecies is biochemically quite distinct. Indeed, the degree of biochemical differentiation between *restrictus* and samples of *pallidus* ($\bar{S} = 0.60$) and *ruficollaris* ($\bar{S}$) = 0.62) is commensurate with that observed between *pallidus* and *ruficollaris* ($\bar{S} = 0.64$; see Hafner 1981).

The geographic distribution of *restrictus* is very limited in comparison to *pallidus* and *ruficollaris.* This subspecies is known from one isolated locality in southeastern Mineral County and more collecting is needed to document the extent of its geographic range. The habitat at the type-locality is characterized by semi-stabilized sand dunes several meters in height (Fig. 2). The vegetation is sparse and the flora is dominated by *Sarcobatus* and *Atriplex.* This restricted sand dune system is separated from other known localities of *M. pallidus* by approximately

30 km of alkali-caked and/or hardpan, gravelly soils, which are not suitable for *M. pallidus* habitation.

Specimens examined.—A total of 14 specimens was examined (MVZ 159969–159982) all from the type-locality.

Etymology.—The subspecific epithet, *restrictus,* is derived from the Latin root *restrict,* and was chosen to reflect both the small geographic range of the new subspecies and its isolation from other populations of the species.

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