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RECORDS OF MEXICAN MAMMALS

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IN the period June to September, 1955, a field party from the University of Michigan Museum of Zoology visited several selected localities in Mexico. The purpose of those visits was to secure additional data for use in a systematic review of Mexican *Sciurus* that is now in progress.¹ Information was obtained on mammals other than squirrels. Some of it that fills in gaps in our knowledge of the Mexican fauna is abstracted below.

COLLECTING LOCALITIES

Collecting stations, arranged alphabetically by state and by nearby town, are as follows. Mileages are air line.

México

Lengua de Vaca (Puerto).—A government checking station and mountain pass on the Toluca-Morelia highway; about 10 mi. E Zitacuaro, Michoacán, and a few hundred yards east of the Michoacán-México state line; elevation 9200 ft. Second growth forest, principally of fir and pine, with a few junipers, oaks, and cherries.

San Cayetano (Criadero de).—A federal game refuge and farm located in the mountains south of the settlements of San Cayetano and Bosencheve (the latter near kilometer 130 on the México-Morelia highway). Collections made near the headquarters buildings and northern limits of the reserve which are about 3 mi. S Bosencheve; elevation 8200 ft. by our altimeter. Second growth pine-oak forest.

Nayarit

San Blas.—Collecting stations in oil palm and tropical deciduous forests on the hills inland from mangrove lagoons; about 4 mi. E the seaport village of San Blas; elevation approximately 100 ft.

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Oaxaca

Tlacolula.—A town 18 mi. SE Oaxaca on the Pan American highway. Collections made on and adjoining limestone hills 1 mi. E Tlacolula, elevation 5700 ft. Arid temperate; mesquite, cactus, maguey.

Tehuantepec.—Specimens from two stations: within and adjoining irrigated coconut and other fruit plantations at the edge of town, elevation approximately 200 ft.; and rugged limestone outcrops covered with arid tropical shrubs and trees 10 mi. W Tehuantepec, 300 ft.

Puebla

Huauchinango.—The city of Huauchinango, elevation 5000 ft., is situated in a cultivated valley on the Pachuca-Tuxpan highway where the highway begins gradual descent to the tropical lowlands. The slopes to the west and south are forested. Pines of several kinds dominate the exposed hilltops and warmer slopes. Alder and other broadleaf trees and shrubs clothe steep north-facing slopes and other protected areas. In late June two cloud levels were evident in this region. Huauchinango, and Necaxa to the northeast, lay between the two. Both morning and evening the upper bank bathed the slopes above Huauchinango, from an elevation of approximately 5300 ft. (about 300 ft. above town) up to 6500 or 7000 ft. The lower bank engulfed lower slopes—the coffee zone—approximately between 3000 and 4000 ft., but extended higher in barrancas.

Collections made at two stations southwest of Huauchinango: in a conifer forest 2 mi. SW, elevation approximately 6000 ft., and in a broadleaf forest 2½ mi. SW, elevation about 6500 ft.

Tehuacán.—Specimens from limestone hills with sparse cover of cactus and thorny shrubs 3 mi. N Tehuacán, 5500 ft.; one specimen from a mesic formation along a stream 2 mi. W Tehuacán, 5200 ft.

Villa Juárez.—Villa Juárez is situated in tropical and subtropical forests at an elevation of 3600 ft. on the Pachuca-Tuxpan highway. At approximately 4500 ft. along the highway these forests give way to drier pine-oak forests. Collecting stations 1 mi. W Villa Juárez, elevation 3900 ft.

Veracruz

Perote.—Perote, elevation 8000 ft., is situated on a sandy plain at the eastern edge of the Mesa Central. Immediately to the south are the lower slopes of the Cofre de Perote. Five to 10 miles to the northeast the plain gives way to barrancas and mountainous slopes that descend to tropical lowlands. In the period from 27 July to 2 August

the cloud belt on those slopes covered the altitudinal range of 5500-6800 ft., approximately. Banderilla, near Jalapa, was below it. La Joya and Las Vigas were within it. Perote was above it. Extending higher in barrancas, particularly those on the eastern face of the Cofre de Perote, the clouds sometimes spilled onto the plain but they did not extend as far west as Perote.

Collections are from stations south and east of Perote as follows: cultivated areas and grasslands on the plain, 2-4 mi. E, 8000 ft.; in a moderately moist canyon, within the lower part of the pine forest belt, 3 mi. E, 8000 ft.; and in foothills at the junction of pine forests and oak-grassland 1½ mi. S, 8500 ft.

LIST OF SPECIES

Cryptotis alticola Merriam.—One example trapped in a moss-lined *Microtus* runway located in a roadway cut-bank in a wet sedge and bunch grass meadow at San Cayetano, México.

The example resembles two specimens of *alticola* from Distrito Federal. Its brain case is slightly broader, relative to skull length, than in those two, however. This record extends the known range of the species westward approximately to the Michoacán-México state line.

Eptesicus fuscus miradorensis Allen.—This rich-brown bat was common around buildings in the pine forests above Perote, Veracruz. Four specimens were collected at three stations near Perote as follows: 3 mi. E; 4 mi. E; and 1½ mi. S.

Thomomys umbrinus subsp.—A male and a female from clearings in pine forests at San Cayetano, México. Three *Cratogeomys*, listed below, were taken in those same small clearings. One of the *Cratogeomys* was trapped within 20 feet of one of the *Thomomys*. Thus, contrary to the supposition of Nelson and Goldman (1934:105), two species of Mexican gophers do sometimes occupy the same local area.

Cratogeomys taylorhinus subsp.—Three males from clearings, also inhabited by *Thomomys umbrinus*, in pine forests at San Cayetano, México.

Coloration in these examples varies from deep chestnut to blackish. The fresh pelage is blackish; the older fur is chestnut. The examples belong to the *gymnurus* group (Hooper, 1948:302), most or all of the forms of which are probably conspecific.

Liomys pictus pictus Thomas.—Twelve specimens from broken igneous rock outcrops in a tropical forest 4 mi. NE San Blas, Nayarit.

In size, breadth of rostrum, and character of interparietal, the series from San Blas resembles samples from Jalisco and Colima and is unlike those from eastern Nayarit and southern Sinaloa (Hooper, 1955:9). In color of upper parts the sample from San Blas averages darker than any other at hand from the Pacific slope of central México. The dark coloration of those populations is correlated with the especially humid tropical conditions that obtain in the coastal segment of Nayarit that includes San Blas. This humid belt extends from Bahía de Balderas north to the vicinity of Navarete and Santiago (Contreras Arias, 1942). Drier conditions obtain to the north, east, and south of the belt. Compostela, the type locality of *L. p. hispidus*, lies near its eastern edge. Santa Isabel, San José del Conde, and Ixtlán del Río are east of it. The spiny pocket mice at those latter localities are smaller and paler, the rostrum is slighter, and the interparietal is usually divided; these are characters of *escuinapae*.

Reithrodontomys megalotis saturatus Allen and Chapman.—One specimen from Lengua de Vaca and 25 from San Cayetano, México.

The first example was trapped beneath a log on the wet, moss- and humus-covered floor of a fir forest. Those from San Cayetano were caught among forbs, sedges, ferns, and grass in openings in a second growth pine-oak forest.

Harvest mice from western México and eastern Michoacán are of special interest because both *R. m. saturatus* and *R. m. zacatecae* might be expected there. Both of these forms occur sympatrically at several localities in west-central Michoacán. The two are connected reproductively in a geographically roundabout way through *R. m. megalotis* (Hooper, 1952a:48). All of the present specimens are referable to *R. m. saturatus*. None has the cinnamon underparts, small bullae, broad mesopterygoid fossa, and shallow zygomatic notch as seen in *zacatecae*.

Reithrodontomys fulvescens difficilis Merriam.—Four specimens from Villa Juárez, Puebla. One of two females was suckling young, and in addition contained three embryos, each 5 mm. in length.

There are few published data on the ecological relationships of *R. fulvescens* and *R. mexicanus*. The two species are sympatric in eastern México (Hooper, 1952a). At Villa Juárez, *R. fulvescens* was taken on the ground—in mixed, comparatively sparse cover such as that bordering cultivated fields or forests. *R. mexicanus* was found principally above the ground level—in open stands of trees and at the border of dense forests.

Reithrodontomys mexicanus mexicanus de Saussure.—Five specimens from Villa Juárez, Puebla. Four are subadults, approximately four-

fifths full adult size. The fifth, an old female, contained six embryos, each 20 mm. in length; she was also lactating.

Field notes pertaining to these specimens provide further evidence that *R. mexicanus* is predominantly arboreal. Four of the five examples were trapped in trees. Traps on the ground usually contained examples of other species or, all too frequently, nothing. The specimens are from situations as follows: 6 feet above ground on the bole of a shade tree in a coffee nursery; 6 feet above ground on a stump in a second-growth forest; in trees in that forest; among ferns, liverworts, herbs, and shrubs at the base of a tree growing along a stream in a second-growth forest.

Peromyscus maniculatus fulvus Osgood.—Seven specimens from 1 mi. E Tlacolula, Oaxaca. These were trapped in a fencerow of maguey, mesquite, cactus, grass, and a few shrubs that separated a cornfield from a limestone cliff. These specimens apparently constitute the southernmost record of *P. maniculatus*.

Peromyscus melanotis Allen and Chapman.—Nine specimens of *P. melanotis* and 11 examples of *P. maniculatus* from 1½ mi. S Perote, Veracruz. The specimens were trapped in shallow ravines cut by an intermittent stream—either on the cut-banks or at the border of the stream bed. Boulders, clumps of bunch grass, and a few baccharis, maguey, oaks, and pines lined the ravines. The adjoining flats and slopes consisted of open pine and oak forests and grasslands.

These examples are of interest because they provide information on the ecological interrelationships of *melanotis* and *maniculatus*. In the highlands of México both species are inhabitants of open situations such as are provided in grasslands, meadows, weedy fields, and second-growth forests. Each utilizes much the same type of plant cover. The two species are largely allopatric. *P. melanotis* lives at generally higher altitudes. It occurs predominantly in the fir and upper pine belts and on slopes and plains above tree line; bunch grass and similar low cover are favored. In the lower parts of the fir and pine zones its range in some areas meets that of the lower-zoned *P. maniculatus*. The locality 1½ mi. S Perote is one of those areas. There, where pine forests give way to open grassy plains, the two species occur in the same narrow ravines and same clumps of grass. The ravines are the principal contact areas for the two species. Lined with bunch grass and a few shrubs those creek valleys constitute avenues of *melanotis*-suited habitat that extend from the fir belt down through the inhospitable open pine forests to the oak belt and

open plains where *maniculatus* lives. In such avenues those two closely related species likely compete for food, cover, and space.

Peromyscus truei.—*P. truei* ranges southward as far as central Oaxaca (Hoffmeister, 1951:53). There, at its southern limit, it apparently is locally as abundant as it is in any other part of its range. We found high populations in the vicinity of Tlacolula. In two nights (approximately 400 trap-nights) we took 57 specimens of *P. truei* and 71 examples of other species. The first night about 100 of the traps were set in habitat unsuitable for *truei*.

The Oaxacan specimens are externally and cranially unlike specimens of *gratus* or *gentilis*, the races of *P. truei* that inhabit the central highlands to the north of Oaxaca. The population differences that apparently are indicated warrant formal recognition.

Peromyscus truei zapotecae, new subspecies

HOLOTYPE.—Adult male, skin and skull; Univ. Mich. Mus. Zool. No. 103080; México, Oaxaca, 1 mile E Tlacolula, 5700 feet elevation; collected 19 August 1955 by Kim Hooper; original No. 112.

CHARACTERS AND COMPARISONS.—A race of *Peromyscus truei* characterized by pale coloration, small size, long tail, narrow brain case, small complex molar teeth, and small auditory bullae.

Compared with *gentilis* from Aguascalientes: Similar in size and tail length; upper parts slightly darker, with a greater intermixture of black; brain case narrower, and auditory bullae and molar teeth smaller.

Compared with *gratus* from Distrito Federal: Slightly smaller and with longer tail (averages 118 per cent of head and body length, compared with 110 per cent in 20 specimens of *gratus*). Upper parts paler, with less black throughout; buffy hues of the hairs more dilute, nearer Light Pinkish Cinnamon instead of Pinkish Cinnamon as in *gratus* (Ridgway, 1912); dorsal tail stripe paler. Brain case narrower (averages 12.6 and 13.0 mm., respectively, in 20 specimens of *zapotecae* and 20 of *gratus*); auditory bullae and molar teeth smaller. Lower molars tending to be more complex in pattern, with a mesostylid or mesolophid, or both, in each (stylid present in M_1 and M_2 , respectively, in 91 per cent and 98 per cent of 44 specimens of *zapotecae* and in 53 per cent and 53 per cent of 30 specimens of *gratus*).

MEASUREMENTS.—Means and extremes (in millimeters) of 20 topotypes of *zapotecae*: total length, 198 (189-212); tail vertebrae, 107 (101-119); hind foot, 22 (21-22); ear from notch, fresh, 22 (21-23);

greatest length of skull, 27.1 (26.0-28.1); greatest breadth of brain case, 12.6 (12.0-13.1); zygomatic breadth, 13.1 (12.3-13.9); length of nasals, 10.0 (9.3-10.6); alveolar length of molar row, 4.1 (3.7-4.3).

REMARKS.—The specimens from Tehuacán resemble the Oaxacan examples in external characters and in size of teeth. They grade toward *gratus* in size of brain case and size of bullae.

The specimens from Tlacolula were trapped on the broken face of a limestone cliff and among boulders at its base. Vegetative cover was sparse. It consisted of cactus, mesquite, a few shrubs and (where out of the reach of sheep and goats) an occasional patch of grass.

SPECIMENS EXAMINED.—Sixty-two from the following localities: Puebla: 3 mi. N Tehuacán, 5500 ft., 3. Oaxaca: vicinity of Huajuapán, 4800 ft., 1; vicinity of Nochistlán, 7000 ft., 1; 1 mi. E Tlacolula, 5700 ft., 57.

Peromyscus difficilis amplus Osgood.—Seven specimens from 1½ mi. S Perote, Veracruz. They were trapped among boulders, bunch grass, and baccharis along an intermittent stream cut-bank at the lower edge of a pine forest.

These are darker dorsally than *amplus* from Acultzingo, Puebla, and they are paler (with less black intermixture) than *felipensis* from Distrito Federal. Their auditory bullae and ears are larger than in any other series—whether of *difficilis*, *amplus*, or *felipensis*—at hand from central México. The ears of the five examples in adult pelage measure 23, 25, 27, 27, and 28 mm. when fresh and 21, 23, 24, 24, and 25 mm. when dry. A thorough analysis of variation in *P. difficilis* is definitely needed.

Peromyscus mexicanus mexicanus de Saussure.—Two specimens from 10 mi. W Tehuantepec, 300 ft., Oaxaca.

Two nights' trapping in the vicinity of Tehuantepec provides information on the ecology of *mexicanus*, *melanophrys*, and *leucopus*, the three species of *Peromyscus* obtained there. The two specimens of *mexicanus* and seven examples of *melanophrys* were taken in rough, broken, limestone malpais that was overgrown with shrubs and small trees. Twelve specimens of *leucopus* were trapped in grassy and weedy areas—on ditch banks, in coconut and banana plantations, and in fencerows bordering cultivated fields.

Peromyscus furvus Allen and Chapman.—Nine specimens from two stations, 2 and 2½ mi. SW Huauchinango, Puebla.

P. furvus and *P. boylei aztecus* were taken in a small canyon at 6500 ft. elevation 2 mi. SW Huauchinango. Both species inhabited

the cloud-bathed pine, oak, and alder forest there. The understory of the forest consisted principally of blackberry, pokeweed (*Phytolacca*), and ferns. Club and true mosses were abundant on logs and stumps. A deep layer of mulch covered the forest floor. Five *furvus* and eight *boylei* were trapped; both species clearly were occupying the same habitat. Stomachs of each species contained fruits of *Phytolacca*.

At the second station (2½ mi. SW, 7000 ft.) *P. furvus* and *Oryzomys alfaroi* were the only small mammals trapped. The forest there consisted entirely of broadleaf species. Also cloud-drenched, it was more moist and dense than at the aforementioned station. There were many rotting logs on the forest floor and a more luxuriant growth of mosses and liverworts on the ground, rocks, and trees. Stomachs of the mice contained blackberries.

These records indicate that *furvus* is an inhabitant of dense, wet, temperate forests, whereas *P. boylei aztecus* occurs in more open oak-pine forests which are less moist and less frequently bathed by clouds.

Sigmodon hispidus obvelatus Russell.—One specimen from dense brush on a ditch bank 2 mi. W Tehuacán, Puebla.

This example and others reported earlier from Tehuacán, Tepanco, and Teotitlán under the name *mascotensis* (Hooper, 1947:54) are better referred to *obvelatus*. The dorsal pallor of *obvelatus* likely is best developed in the Tehuacán-Teotitlán-Cuicatlán basin, where extreme dilution in pelage coloration is seen in several species of mammals (Hooper, 1952b:97).

Pitymys quasiater Coues.—Five specimens from Villa Juárez, Puebla.

This species occurs both in marshes and on uplands. Three examples were trapped in runways through grasses and sedges in a marsh bordering a small meandering creek. Two were obtained in a fence row bordering an orange grove and a second-growth subtropical forest in which there was an understory of weeds, shrubs, and small trees.

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