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## Seven New Mammals from México

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In the preparation of a report on the recent collections made by Thomas MacDougall in México, I find it necessary to recognize a new species of pygmy shrew (*Cryptotis*), two new species of spiny pocket mice (*Heteromys* and *Liomys*), three new subspecies of white-footed mice (*Peromyscus*), and a new subspecies of cotton rat (*Sigmodon*). The first three may also prove to be geographical forms of named species, but for the present it seems best to give them specific rank.

*Cryptotis celatus*,<sup>1</sup> new species

OAXACA PYGMY SHREW

TYPE: A.M.N.H. No. 145838, skin and skull, adult male; Las Cuevas, Santiago Lachiguiri, District of Tehuantepec, Oaxaca, México; collector, Thomas MacDougall; December 15, 1947; original no. 623. The type skin is in fair condition, and the skull is complete.

GENERAL CHARACTERS: A small, brown, short-tailed shrew of the *Cryptotis parva* group, without any reddish tint in the pelage, and similar in external characters to *C. p. berlandieri* Baird from Tamaulipas, Mexico, but differing in distinctive cranial characters.

DESCRIPTION OF TYPE: Color of upper parts Prout's Brown,<sup>2</sup> the hairs Plumbeous at base, followed by a band of Light Buff and tipped with Prout's Brown. Under parts Light Buff; tail Prout's Brown above, below Light Buff; all four feet rather sparsely covered with Light Buff hairs, the feet themselves flesh-colored.

<sup>1</sup> Refers to the secretive habits of this shrew.

<sup>2</sup> Capitalized color terms are from Ridgway, "Color standards and color nomenclature," Washington, D. C., 1912.

Skull long and slender; braincase essentially on plane of rostrum, with a very shallow sulcus between; tooth row long and heavily pigmented; first upper unicuspid tooth much smaller than second; third unicuspid tooth less than half of the size of the first; anterior internal cusp on large premolar undeveloped and without pigment; first and second upper molars only slightly concave on posterior border.

MEASUREMENTS OF TYPE: Skin: total length, 67 mm.; length of tail, 14; hind foot, 11. Skull: greatest length, including incisors, 17.7; greatest length, excluding incisors, 16.9; maxillary breadth, 5.3; breadth of cranium, 7.5; interorbital breadth, 4.1; palatal length, 6.7; post-palatal length, 8; entire upper tooth row, 7.8; maxillary tooth row, c-m<sup>3</sup>, 4.8.

REMARKS: The type and only specimen was caught by hand under a rotten log.

Except for the long, narrow skull, *Cryptotis celatus* closely resembles specimens of *C. p. berlandieri* from Tamaulipas, especially in external appearance. It is noticeably smaller and browner, and the skull is smaller and more slender, than in specimens of *C. micrura* from Guatemala. *Cryptotis pergracilis pueblensis* and other allied forms of *pergracilis* have relatively shorter and broader skulls than *celatus*, and the pelage in these forms is decidedly darker and more reddish than in *celatus*.

*Liomys pinetorum*,<sup>1</sup> new species

TONALÁ SPINY POCKET MOUSE

TYPE: A.M.N.H. No. 167408; skin and skull, adult female; San Miguel, about 4000 feet elevation, 24 kilometers northeast of Tonalá, Cerro Tres Picos, District of Tonalá, Chiapas, México; collector, Thomas MacDougall; original no. 1350. The skin of the type is in good condition, and the skull is complete, with teeth showing considerable wear.

GENERAL CHARACTERS: A rather large, reddish brown, spiny pocket mouse, with an indistinct, buffy, lateral line; hind foot thinly haired posteriorly, and six-tuberculate; similar in general external characters to *Liomys pictus isthmus* Merriam from the coastal plains and interior valleys on the southern side of the Isthmus of Tehuantepec, but darker and more richly colored, with a larger and more massive skull and noticeably larger molariform teeth.

DESCRIPTION OF TYPE: Color in fresh, unworn pelage: spines on upper parts whitish from base for most of their length, tipped with dark Mummy Brown and mixed with long Orange-Buff hairs, darkest on top of the head; under parts, including forearms, fore and hind feet, and inner side

<sup>1</sup> Refers to its habitat.

of hind limbs, white to roots of hairs; outer side of hind limbs like sides of body; a narrow lateral line extending from cheeks to base of tail Orange-Buff; tail scantily haired, Mummy Brown above, dull whitish below, becoming slightly darker towards tip; ears Mummy Brown, with scarcely a trace of whitish margin.

Skull large, with a relatively high, broad braincase; superior outline nearly straight, but slightly depressed in the region behind nasals; rostrum short and moderately heavy; nasals long and narrow, truncate posteriorly, and not extending beyond the posterior border of premaxillae; interparietal large and evenly oval in shape; braincase large but rather sharply constricted in interorbital region; interpterygoid fossa wide; bullae small; upper molariform teeth large and uncrowded, the tooth rows long, slightly spreading posteriorly; teeth graduate in size, becoming smaller posteriorly, but the graduation is slight as compared to that in *pictus*, the last molar being relatively large; the permanent molars are not compressed anteroposteriorly, and the individual teeth are more rounded than in any other form of the *Liomys pictus* group.

MEASUREMENTS OF TYPE: Skin: total length, 214 mm.; tail vertebrae, 142; length of hind foot, 28; length of ear from notch (after dampening), 12.5, in dry skin, 28.5. Skull: greatest length, 33.4; zygomatic breadth, 15.5; length of nasals, 14.7; breadth of cranium (immediately in front of the projection of the auditory meatus), 14.8; interorbital breadth, 7.9; breadth of rostrum (at junction of maxilla and premaxilla), 5.6; breadth of interparietal, 9.1; length of interparietal, 5.5; width of palate (across last molars), 6; alveolar length of maxillary tooth row, 5.5; alveolar length of mandibular tooth row, 5.

REMARKS: *Liomys pinetorum* seems to be a distinct species, though it is a member of the *Liomys pictus* group of spiny pocket mice. It can be readily distinguished from any of the described forms of this group by the strongly developed characters of the skull and teeth, which appear to be outside the range of individual variation for local forms.

The type and only known specimen has a decidedly larger skull and much less crowded dentition than any specimen examined in the large series of *L. p. isthmius* from lower elevations near Tonalá and from other localities on the coastal plains and interior valleys on the southern side of the Isthmus of Tehuantepec. It is near the size of *L. annectens* (Merriam) from Pluma, Oaxaca, but can be distinguished from that species by its shorter tail, smaller foot, more buffy coloration, and by its distinctive cranial characters.

The type was taken on a high ridge, north of the Pacific coastal range of the Sierra Madre, where pine and hardwoods are the principal trees.

*Heteromys nigricaudatus*, new species

## BLACK-TAILED SPINY POCKET MOUSE

TYPE: A.M.N.H. No. 165995, skin and skull, adult female; Mazatlán, about 1500 feet elevation, District of Mixes, Oaxaca, México; collector, Thomas MacDougall; December 10, 1953; original no. 1268. The type skin is in good condition, and the skull is complete except that the pterygoid processes are broken. The teeth show considerable wear, with enamel loops completely united at one end of sulcus in upper and lower molars.

GENERAL CHARACTERS: A relatively small, spiny pocket mouse for the genus *Heteromys*, with a short, nearly unicolor, blackish tail, no buffy lateral line, and a short, broad skull.

DESCRIPTION OF TYPE: General color of upper parts in fresh pelage about Mummy Brown, the spines Light Mouse Gray from base, tipped with Dark Mouse Gray and heavily mixed with slender, Light Ochraceous-Buff hairs; color of outer sides of forearms grayish tinged with buff, this color merging above with general color of upper parts; feet and under parts white, the white extending in a continuous line along inner sides of hind limbs from under parts to feet; sides of ankles to heels Blackish Brown (2); upper sides of hind limbs similar to and continuous with color of upper parts; ears Blackish Brown (3) with a very fine, indistinct, whitish margin; tail practically naked, relatively few short, whitish hairs on under side but not sufficient to cast more than a faint light shade over the under side of the otherwise unicolored, short, black tail.

Skull small, short, and broad posteriorly, moderately well arched along median line above; bullae small and well rounded; molar teeth relatively large, anterior molars as wide as premolars; rostrum short and slender, broadening abruptly at maxillary-premaxillary suture; premaxillae narrow and terminating posteriorly on a line with posterior border of nasals; interparietal large and very broad; zygomatic arches not spreading anteriorly, the sides nearly parallel.

MEASUREMENTS OF TYPE: Skin: total length, 283 mm.; length of tail, 153; hind foot, 36 (after dampening, 36.5). Skull: greatest length, 36; zygomatic breadth, 17; interorbital breadth, 9; length of nasals, 14.5; width across squamosals in front of auditory meatus, 16; interparietal, 6.5 by 10; width of rostrum at maxillary-premaxillary suture, 6.2; alveoli of maxillary tooth row, 5.6.

REMARKS: The Mazatlán specimen seems to represent a species quite distinct from local forms. *Heteromys lepturus* Merriam from the moun-

tains a few miles west of Guichicovi is a much larger mouse than *nigricaudatus*; the ankles in Merriam's species are dusky all around, a buffy lateral line is usually present, and the animal has a much larger and more massive skull, with a heavier rostrum than the new form. *Heteromys d. griseus* Merriam has been recorded from Guichicovi, but, compared with *H. nigricaudatus*, it is considerably larger, and, like *H. lepturus*, has a much longer (170-191) and more sharply bicolored tail, with the scales as well as the hairs on the under side white, contrasting with the short (153), nearly unicolored tail of the new form. The cranial differences separating *nigricaudatus* from *lepturus* and *griseus* are also distinctive.

A subadult specimen from Ixcuintepec, 25 kilometers southwest of the type locality, is referred to this species. It also has a short tail, but the under side is considerably lighter than in the type. The range of *H. nigricaudatus* is probably restricted to the humid, forested, mountain slope rising from the west side of the Isthmus of Tehuantepec in central Oaxaca.

*Peromyscus leucopus lachiguiriensis*, new subspecies

LACHIGUIRÍ WHITE-FOOTED MOUSE

TYPE: A.M.N.H. No. 146070, skin and skull, adult male, molariform teeth showing considerable wear; San José Lachiguirí, District of Miahuatlán, Oaxaca, México; altitude 4000 feet; Thomas MacDougall, collector; January 11, 1949. The type skin is in good condition, and the skull is complete except for one bulla and a small posterior molar. Besides the type there are two subadult and four immature topotypes.

GENERAL CHARACTERS: A rather small, dark-colored subspecies, with entire upper parts strongly suffused with dusky, distinctly darker and decidedly more grayish than *P. leucopus affinis* Allen of the tropical lowlands on the southern side of the Isthmus of Tehuantepec, and much darker than *P. l. incensus* Goldman of northeastern Oaxaca, skull more arched and much narrower, with noticeably smaller braincase than either.

DESCRIPTION OF TYPE: Color in fresh, unworn pelage; general effect of upper parts Hair Brown, this color being made up of mixed Drab and blackish brown hairs; sides of body near Drab; face Drab Gray; ears blackish brown, hairs on outside blackish, hairs on inside near margin white, producing a fine whitish margin to the ear; feet white, ankles slightly dusky; under parts creamy white, the light tips to the hairs not completely covering the dusky basal color; tail slender and scantily haired, blackish brown above, soiled whitish below.

Skull long and narrow, strongly elevated in interorbital region; brain-

case small and narrow, much smaller than in *affinis* or *incensis*; supraorbital border smoothly rounded; molariform teeth narrow but tooth rows relatively long. Measurements of type and a subadult male topotype: total length of skin, 190 mm., 175; length of tail, 90, 72; hind foot 20, 20; ear from notch after dampening, 14.6, 14.6. Skull: occipitonasal length, 26.5, 25.3; condylobasal length, 24.1, 23.0; zygomatic breadth, 13.2, 12.7; interorbital breadth, 4.3, 4.2; breadth of braincase, over auditory meatus, immediately in front of lateral occipital crests, 10, 10; length of nasals, 10.5, 10.4; length of anterior palatine foramina, 5.0, 4.6; length of palatal bridge, 4.2, 4.2; length of upper molar series, 3.8, 3.7.

REMARKS: The dark grayish color of the pelage and the small narrow skull in *lachiguiriensis* readily distinguish it from all other named Mexican forms of the *Peromyscus leucopus* group. The six topotypes are even darker in color than the type and have similar narrow skulls with a small braincase. The type series was taken in stands of *Aloe vera*, on dry cut-over land, in a limestone formation and at an elevation of about 4000 feet.

*Peromyscus megalops azulensis*, new subspecies

CERRO AZUL MOUSE

TYPE: A.M.N.H. No. 171710, skin and skull, adult male; Cerro Azul, District of Juchitan, Oaxaca, México. Altitude about 7000 feet. Thomas MacDougall, collector, March 8, 1956; original number, 1634. The type skin is in good condition, and the skull is complete.

GENERAL CHARACTERS: A rather large, blackish brown, white-footed mouse with a relatively short, indistinctly bicolored tail; pelage long, very soft, and thick; similar in external characters to *Peromyscus lepturus* but much larger, about the size of typical *P. megalops* but tail shorter and less hairy and differing in distinctive cranial characters.

DESCRIPTION: General color of upper parts brownish black lightly mixed with Cinnamon; cheeks and sides of body less modified with black than back; a broad line from base of whiskers to and around eye and back to base of ear blackish brown; tip of nose blackish, with a few buffy-tipped hairs; under parts white, somewhat modified by the under color of hair; pectoral region slightly tinged with tawny; forefeet white; hind feet white, with a broad dusky area extending from tarsal joint over most of the hind foot nearly to the base of toes; tail coarsely haired, dusky above, white below, with some dusky blotching on scaly part. Skull large, long, and narrow; frontals broad and distinctly beaded over orbit, this ridge extending back across parietal to interparietal; braincase high, rounded, and elongate; interpterygoid space U-shaped anteriorly and not sharply

squared as in *megalops*; palatine slits long and narrow, reaching posteriorly to a line across front of anterior molars; interparietal broad and long as in *megalops*; bullae small; molar teeth large and strong; upper incisors nearly at right angle to skull and not curved sharply backward as in most forms of *Peromyscus*.

MEASUREMENTS OF TYPE: Skin: total length, 249 mm.; length of tail, 119; hind foot, 29. Skull: greatest length, 35.3; zygomatic breadth, 16.6; interorbital breadth, 5.6; interparietal, 11.5 by 4.3; length of nasals, 13.5; width of braincase in front of occipital crests, 13.5; width of palate across molars, 6.7; alveolar length of upper molar series, 5.3.

REMARKS: In length and softness of pelage and measurements *P. azulensis* is similar to *sloeps*, but it has a shorter tail, is blackish instead of tawny in color, and has blackish instead of white feet; the skulls of the two forms are also somewhat similar, but in *azulensis* the teeth are longer and stronger, the supraorbital bead extends farther back posteriorly, and the interorbital area is flat instead of inflated. With the additional material now available it seems advisable to take *sloeps* out of the *banderanus* group and consider it as a possible aberrant form of *megalops*, quite distinct from *P. m. melanurus*.

*Peromyscus banderanus coatlanensis*, new subspecies

COATLÁN MOUSE

TYPE: A.M.N.H. No. 167453, skin and skull, adult female; Agua Sarca, about 7 kilometers southwest of Coatlán, District of Tehuantepec, Oaxaca, México. Altitude about 3500 feet. Thomas MacDougall, collector, December 10, 1954. The type skin is in good condition, and the skull is complete.

GENERAL CHARACTERS: A moderately large, buffy-colored mouse with rather short, soft pelage, indistinctly bicolored tail, about as long as head and body; very similar to *P. b. angelensis* but skull larger and with some distinctive cranial characters.

DESCRIPTION OF TYPE: Color of upper parts Cinnamon Buff mixed with blackish brown hairs, darkest on top of head and middle of back and becoming near clear Cinnamon Buff on cheeks and lower sides; a narrow blackish ring around eye; forefeet and hind feet white to wrists and ankles; tail rather coarsely annulated, finely haired, blackish brown above and blotched with yellowish white below; under parts creamy white; pectoral spot deep Cinnamon Buff, narrow, sharply defined, and produced in a narrow line posteriorly. Skull large, braincase broad and rounded; frontals narrow, supraorbital ridges well developed and extended backward on

parietals; rostrum slender, tapered anteriorly; nasals relatively long; zygomatic arches widely spreading; anterior palatine foramina relatively long but not reaching plane of anterior molars; interpterygoid space broad, squared anteriorly, about as in *angelensis*; molariform teeth relatively small. The skull of *coatlansensis* is larger and broader than that of *angelensis*, with a larger braincase, and the interorbital area is narrower and slightly swollen.

MEASUREMENTS OF TYPE: Skin: total length, 245 mm.; length of tail, 130; hind foot, 26. Skull: greatest length, 34; zygomatic breadth, 16.5; interorbital breadth, 5.2; breadth of braincase in front of occipital crests, 13.5; width of palate across molars, 6.5; length of nasals, 13.0; width of zygomatic plate, 2.8; length of anterior palatine foramina, 6.2; alveoli length of upper molar series, 4.4.

REMARKS: *Peromyscus b. coatlansensis* is clearly a geographical variation of *angelensis*, occurring in the region over the divide in Tehuantepec on the Gulf drainage. The range of *angelensis* is apparently restricted to southern Oaxaca from Pinotepa east to the Rio Tehuantepec on the Pacific coast drainage. Some old individuals with worn teeth in a large series of *angelensis* from west of the Rio Tehuantepec have skulls as large as the skull of *coatlansensis*, but in these the frontals are broader and the braincase is narrower and more elongate.

The type and two immature topotypes were taken among large rocks in pine and oak woods.

*Sigmodon hispidus ischyryus*, new subspecies

"EL ARCO" COTTON RAT

TYPE: A.M.N.H. No. 171600, skin and skull, adult male; "El Arco," gorge of Río Grande, Santo Domingo Chontecomatlán, District of Yau-tepec, Oaxaca, México. Altitude 2600 feet; collector Thomas MacDougall, October 11, 1955, original no. 1446. The type skin is in good condition, and the skull is complete, with teeth showing considerable wear.

GENERAL CHARACTERS: A large, robust, reddish brown cotton rat, with rather long, coarse pelage, moderately long tail, and dusky areas on upper sides of fore and hind feet; approaching *Sigmodon h. mascotensis* in size but pelage thicker, richer, and darker in color and differing in distinctive cranial characters; in general color and texture of pelage *ischyryus* is not unlike *S. h. saturatus* but is much larger in size.

DESCRIPTION OF TYPE: General color of upper parts Ochraceous-Tawny mixed with black; cheeks, sides of body, and rump Ochraceous-Beff less modified with black than back and becoming clear Ochraceous-Beff on

lower sides, this color extending along forearms to and including fingers, the dark basal color of the hair showing through on upper side of fore feet halfway to toes; a pronounced patch of brownish black on under side of wrists; upper side of hind feet Warm Buff, with a broad dusky line extending almost to base of toes; a very narrow black circle around edge of eye followed by a broader clear Ochraceous-Buff ring; ears dusky, nearly naked on outside and sparsely covered with light buff hairs on inner side; postauricular patch clear Ochraceous-Buff; tip of nose clear Ochraceous Tawny; top of head like back; tail moderately well haired, the scaly part blackish all around, the hairs blackish brown above, dull white below, the line of demarcation not sharply defined; under parts pale buff, covering the plumbeous basal color of the hair. Skull strong and massive, with strongly developed supraorbital ridges that extend backward from front of orbit with a prominent sharp postorbital angle and thence across parietals in nearly parallel straight lines to occipital crests; interorbital region elevated; zygomatic arches strong, broadly spreading, and widest posteriorly; interorbital space narrow; rostrum relatively long and slender; nasals long and narrow, depressed anteriorly, truncate posteriorly, and reaching a line across extreme anterior border of orbits but not reaching posterior border of premaxillae; palatine slits long and narrow; bullae relatively small; incisor and molariform teeth small; interparietal narrow anteroposteriorly; supraoccipital with only a slight median ridge.

MEASUREMENTS OF TYPE: Skin: total length, 295.5 mm.; length of tail, 145.5; hind foot, 34.5; ear from notch, 20. Skull: greatest length, 37.7; condylobasal length, 36.1, basal length, 33.5; zygomatic breadth, 21.2; interorbital breadth, 5.2; length of nasals, 15; width of zygomatic plate, 4.2; width of palate across tooth rows, 8.5; width of braincase immediately in front of occipital crests above auditory meatus, 13.6; greatest width across parietal ridges, 13; anterior palatine foramina 8.1 by 2.15, alveolar length of maxillary tooth row, 6.5.

REMARKS: *Sigmodon hispidus ischyryus* can readily be distinguished from *mascotensis* by its richer color, smaller size, and by the broad dusky markings on the upper sides of the fore and hind feet. The skull of *ischyryus* differs from that of *mascotensis* in smaller size, narrower braincase, relatively longer and more slender rostrum and nasals, smaller bullae, and smaller teeth. It is perhaps nearest to *S. h. saturatus*, but its much larger size, longer tail, and longer pelage seem to distinguish it from the latter.

El Arco is a rocky canyon in arid hardwood country with a few pines. The type specimen is fully adult and has apparently reached its maximum growth. All sutures in the skull except the nasals are well fused together, and the teeth show considerable wear on the surface but not below the

enamel folds. In any comparison of *ischyrus* with *mascotensis* it should be remembered that most Oaxaca and Colima specimens of *mascotensis* of the same age are fully as large as *S. h. major*. Unfortunately, Allen's type of *Sigmodon mascotensis* is not only immature but it is a small individual with small teeth and very small bullae; the type of *Sigmodon colimae*, while also very immature, is more like what is now considered typical *mascotensis*.