MAMMALIAN SPECIES No. 28, pp. 1–3, 2 figs.

Cryptotis mexicana. By Jerry R. Choate

Published 13 June 1973 by The American Society of Mammalogists

Cryptotis mexicana (Coues, 1877)

Mexican Short-tailed Shrew

Blarina (Soriciscus) mexicana Coues, 1877:652 [not *Blaria mexicana* Gray, 1843:xxi, a *nomen nudum*]. Type locality "Xalapa, Mexico" (Coues, 1877:653) [= Jalapa, *ca.* 1520 m, Veracruz].

Cryptotis mexicana: Miller, 1911:221.

CONTEXT AND CONTENT. Order Insectivora, Family Soricidae, Subfamily Soricinae, Tribe Blarinini (see Repenning, 1967). The genus *Cryptotis* includes approximately 12 Recent species. Four subspecies of *C. mexicana* currently are recognized (Choate, 1970):

C. m. mexicana (Coues, 1877:652), see above.

C. m. nelsoni (Merriam, 1895:26). Type locality "Volcano of Tuxtla [= Volcán San Martín], Vera Cruz, Mexico (altitude 4,800 feet)."

C. m. obscura (Merriam, 1895:23). Type locality "Tulancingo, Hidalgo, Mexico (altitude, 8,500 feet)," (*madrea* Goodwin, 1954, a synonym).

C. m. peregrina (Merriam, 1895:24). Type locality "mountains 15 miles west of city of Oaxaca, Mexico (altitude, 9,500 feet)," (*phillipsii* Schaldach, 1966, a synonym).

DIAGNOSIS. Size medium for genus; tail relatively short, averaging 33 to 42% of length of head and body; front feet usually not markedly enlarged for fossorial habits; skull relatively robust and rostrum short (figure 1); braincase angular; anterior limit of zygomatic plate (in lateral view) varying from slightly anterior to metastyle of M1 to above juncture of M1 and M2; posterior limit of zygomatic plate at level of or posterior to maxillary process, above M3; dentition not bulbous; anterior element of ectoloph of M1 not reduced relative to posterior element; posterior surfaces of P4 through M2 negligibly or only slightly recessed; protoconal basin of M1 not reduced relative to hypoconal basin; M3 consisting of paracrista, precentrocrista, postcentrocrista, and metacone (vestigial metacrista, hypocone, or cingular cusplet sometimes present); talonid of m3 consisting of well developed hypoconid and entoconid, the latter infrequently reduced (Choate, 1970:224; dental terminology illustrated in fig. 2, p. 210). Merriam (1895: 102), Hall and Kelson (1959:59), Goodwin (1969:plate 2), Choate (1969:471–474), and Choate (1970:211–212) illustrated additional details of the skull and dentition.

Geographic change in *C. mexicana* generally is gradual, but with prominent steps separating the four subspecies. With few exceptions, external and cranial dimensions increase clinally from northwest (populations representing the subspecies *obscura*) to southeast (culminating in the subspecies *nelsoni* and *peregrina*). Teeth are much more deeply pigmented in *obscura* than in other populations, whereas they are most specialized (posterior surfaces of teeth P4 through M2 slightly recessed) and reduced (entoconid on talonid of m3 sometimes reduced or lacking altogether, upper fourth unicuspids reduced in size or lacking altogether—Schaldach, 1966) in *peregrina*. Individuals of *peregrina* sometimes possess much larger forefeet and claws than do those of other populations (Choate, 1970).

GENERAL CHARACTERS. Total length is 83 to 112 mm; length of hind foot 11 to 17; condylobasal length 17.5 to 20.2; palatal length 7.2 to 8.8; maxillary breadth 5.4 to 6.8; interorbital breadth 4.4 to 5.4; length of maxillary toothrow 5.8 to 7.6; and cranial breadth 8.8 to 10.7 mm. Juvenal and adult summer pelages seldom are distinctly colored and usually appear blackish gray because of shortness of reddish brown tips on otherwise gray hairs; winter pelage is luxuriant and vermiculations are present only when pelage is fresh (and even then vermiculations are uncommon except at high elevations); dorsum is dark brown, varying from Sepia or Clove to Bister or Mummy Brown (capitalized color terms after Ridgway, 1912) in specimens collected in 1894, nearer Bister or Clove in specimens collected more recently (1964); overall appearance of venter usually is only slightly paler than that of dorsum, although individual hairs of the venter are tipped with pale buff.

As is the case for most other taxa of shrews thus far studied (summarized by Choate, 1971), individuals of *C. mexicana* achieve essentially "adult" external and cranial dimensions before leaving the nest; thus, little variation with age occurs in the trappable population. Likewise, secondary sexual differences in mensural characteristics generally are lacking. Seasonal variation, on the other hand, is most prominent with regard to color and texture of pelage (Choate, 1970).

DISTRIBUTION. Specimens are known from the Sierra Madre Oriental at least as far north as Gómez Farías, Tamaulipas, southward through northeastern Querétaro, Hidalgo, and northern Puebla to west-central Veracruz, then southward on the Sistema Montañoso Oaxaqueño-Poblano and the Sierra Madre del Sur in Oaxaca, and eastward across the Isthmus of

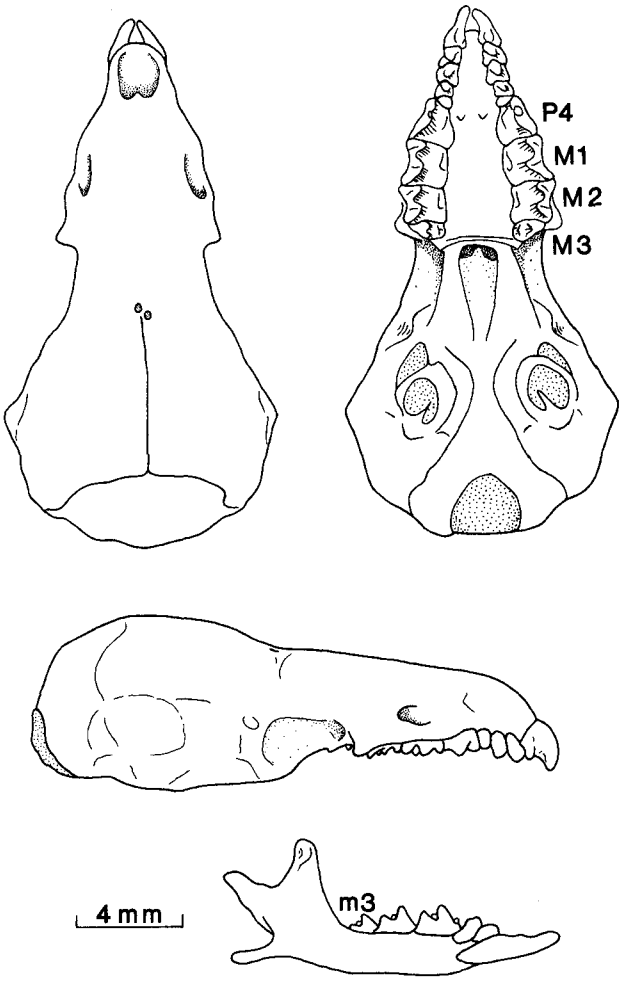

FIGURE 1. Dorsal, ventral, and lateral views of skull, and lateral view of lower jaw of *Cryptotis mexicana mexicana* (KU 29537, male, from Las Vigas, Veracruz). Teeth referred to by symbols in text are labelled.

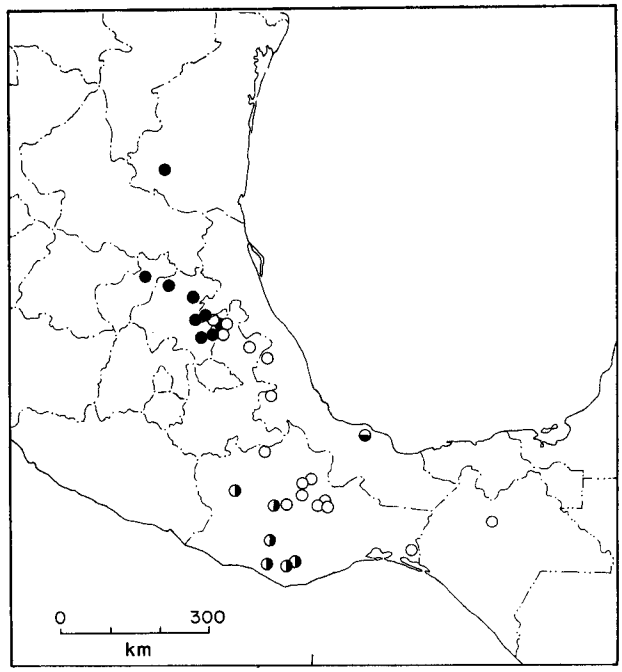

FIGURE 2. Records of occurrence of *Cryptotis mexicana* in México. Solid symbols represent the subspecies *C. m. obscura*; open symbols represent *C. m. mexicana*; symbols half-solid right represent *C. m. peregrina*; the one symbol half-solid below represents *C. m. nelsoni*. Modified from Choate (1970: 225, fig. 6).

Tehuantepec to the Mesa Central of Chiapas. Localities plotted on figure 2 correspond to lists of specimens examined by Choate (1970:234, 235, 237, 239). In terms of biotic assemblages, *C. mexicana* resides primarily in the Humid Upper Tropical Subzone of Goldman (1951:346–352), with some overlap into the Canadian Zone. The known altitudinal range of the species is 520 to 2900 m on the Sierra Madre Oriental, 1460 m on Volcán San Martín, 950 to 3200 m on the Sistema Montañoso Oaxaqueño-Poblano, 1280 to 2900 m on the Sierra Madre del Sur, and 2120 m on the Mesa Central (Choate, 1970:227).

FOSSIL RECORD. *Cryptotis mexicana* is known from subfossils from the Gómez Farías region of Tamaulipas (Koopman and Martin, 1959:4), and from a late Pleistocene (probably interglacial) deposit in San Josecito Cave, near Aramberri, Nuevo León (Findley, 1953:637). The species is thought to have originated in México, possibly during the Pliocene, and to have undergone radiation primarily on the mountains of southern México (Choate, 1970:302–305).

FORM AND FUNCTION. The time spent in summer pelage (and reciprocally in winter pelage) varies geographically and altitudinally, as do times of molting. Individuals in summer pelage have been collected in May through December; those molting from summer to winter pelage in September and October; those molting from juvenal to winter pelage in December and January; those in winter pelage in September, and December through April; those molting from winter to summer pelage in June; and those molting from juvenal to summer pelage in May, and July through October (Choate, 1970:222, 227–228).

ECOLOGY. *Cryptotis mexicana* is thought to occur primarily in humid montane forests of oak or pine, often containing mosses, lichens, orchids, and bromeliads (Choate, 1970:227), but also inhabits humid, upper tropical habitats other than undisturbed forests. One specimen from Tamaulipas was trapped "in an overgrown ditch which drains from a low section of a peach orchard and terminates in . . . cloud forest," whereas another specimen from the same locality was caught at the base of "a stone wall separating . . . [a peach] orchard from a pasture" (Goodwin, 1954:2). In Hidalgo, specimens were collected in "fir woods . . . [where they] were living in small runways under the shelter of old logs" (Merriam, 1895:23). In Veracruz, this species was reported to be "numerous along the lower border of the oak forest . . . [and] along the border of . . . canyons or along ditches bordering fields. They live in damp situations grown up rankly with grass and weeds. In several places their little trails were found threading their way through the plant stems and terminating in a small hole at each end" (Merriam, 1895:24). Also in Veracruz, Hall and Dalquest (1963:206) reported specimens caught in "six-inch high succulent vegetation along a small stream," in "long hedges of maguey plants . . . [separating] cornfields," in "deep moss in a small, cold valley in . . . [a] pine forest," in "a patch of wild bananas," and in "dense, dry brush on an overgrown hillside." Goldman (1951:282–283) described the site of capture of specimens on Volcán San Martín in Veracruz as being covered with "heavy layers of sand and ashes" that quickly absorbed all surface moisture. The vegetation was said to consist of "virgin forest, including many fine trees. Among these were Spanish cedars, wild figs, and others of large size." In Oaxaca, one specimen was obtained "from wet leaf litter and humus on a moist, densely vegetated streamside. . ." (Musser, 1964:6).

The only published accounts of reproductive activity in *C. mexicana* are those of Hall and Dalquest (1963:206), which mentioned several October-caught females that were lactating and one December-caught female that contained three embryos measuring 5 mm in crown-rump length. However, specimens judged to be young, on the basis of unworn teeth and juvenal pelage, are available in collections from every month of the year. It seems likely, therefore, that *C. mexicana* reproduces throughout the year, at least when all populations of the species from various elevations and latitudes are considered together (Choate, 1970:227).

REMARKS. Little published information is available on form, other than that of the dentition and cranium, of these shrews, and no information as yet is available regarding physiology or other dynamic aspects of function, behavior, population structure, or genetics.

ETYMOLOGY. The name *Cryptotis* is derived from the Greek *kryptos* (secret, hidden) and *otos* (ear) and refers to the large opening to the ear that is effectively concealed by the pelage of the head. The name *mexicana* probably refers to the fact that this was the first representative of the genus "*Blarina* (*Soriciscus*)" to be discovered in México. The subspecific name *nelsoni* refers to Edward William Nelson, who, together with Edward Alphonso Goldman, conducted biological explorations in México during the years 1892–1906 and amassed most of the specimens on which C. Hart Merriam based his early revision of the genus. The name *obscura* probably refers to the inconspicuous habits of these shrews, whereas *peregrina* is derived from the Latin *peregrinus* (strange, foreign) and probably refers to the peculiar specializations of the teeth in the population given this name.

LITERATURE CITED

Choate, J. R. 1969. Taxonomic status of the shrew, *Notiosorex* (*Xenosorex*) *phillipsii* Schaldach, 1966 (Mammalia: Insectivora). Proc. Biol. Soc. Washington 82:469–476.

— 1970. Systematics and zoogeography of Middle American shrews of the genus Cryptotis. Univ. Kansas Publ., Mus. Nat. Hist. 19:195–317.

— 1972. Variation within and among populations of the short-tailed shrew in Connecticut. Jour. Mammal. 53: 116–128.

Coues, E. 1877. Precursory notes on American insectivorous mammals, with descriptions of new species. Bull. U. S. Geol. Geogr. Surv. 3:631–653.

Findley, J. S. 1953. Pleistocene Soricidae from San Josecito Cave, Nuevo Leon, Mexico. Univ. Kansas Publ., Mus. Nat. Hist. 5:633–639.

Goldman, E. A. 1951. Biological investigations in Mexico. Smithsonian Misc. Coll. 115:xiii + 476.

Goodwin, G. G. 1954. A new short-tailed shrew and a new free-tailed bat from Tamaulipas, Mexico. Amer. Mus. Novit. 1670:1–3.

— 1969. Mammals from the state of Oaxaca, Mexico, in the American Museum of Natural History. Bull. Amer. Mus. Nat. Hist. 141:1–269.

Gray, J. E. 1843. List of the specimens of Mammalia in the collection of the British Museum. British Museum (Natural History), London, xxviii + 216 pp.

Hall, E. R., and W. W. Dalquest. 1963. The mammals of Veracruz. Univ. Kansas Publ., Mus. Nat. Hist. 14:165–362.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Ronald Press, New York, 1:xxx+1–546,+79 pp.
Koopman, K. F., and P. S. Martin. 1959. Subfossil mammals from the Gómez Farías region and the tropical gradient of eastern Mexico. Jour. Mammal. 40:1–12.
Merriam, C. H. 1895. Revision of the shrews of the American genera Blarina and Notiosorex. N. Amer. Fauna 10:5–34, 102–107.
Miller, G. S., Jr. 1911. Three new shrews of the genus *Cryptotis*. Proc. Biol. Soc. Washington 24:221–224.
Musser, G. G. 1964. Notes on geographic distribution, habitat, and taxonomy of some Mexican mammals. Occas. Papers Mus. Zool., Univ. Michigan 636:1–22.
Repenning, C. A. 1967. Subfamilies and genera of the Soricidae . . . . U. S. Geol. Surv. Prof. Paper 565:iv + 1–74.
Ridgway, R. 1912. Color standards and color nomenclature. Washington, D. C., privately printed, iv + 44 pp.
Schaldach, W. J., Jr. 1966. New forms of mammals from southern Oaxaca, Mexico, with notes on some mammals of the coastal range. Säugetierk. Mitt. 14:286–297.

Principal editor of this account was S. ANDERSON.

J. R. CHOATE, MUSEUM OF THE HIGH PLAINS AND DEPARTMENT OF BIOLOGICAL SCIENCES AND AGRICULTURE, FORT HAYS KANSAS STATE COLLEGE, HAYS, KANSAS 67601.