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Plecotus mexicanus.

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Plecotus mexicanus (Allen, 1916)

Mexican Big-eared Bat

Corynorhinus megalotis mexicanus Allen, 1916:347. Type locality near Pacheco, Chihuahua, Mexico, restricted by Handley (1959) to Sierra de Breña, 8,000 ft.
Plecotus mexicanus Handley, 1959:141.

CONTEXT AND CONTENT. Order Chiroptera, Family Vespertilionidae, Subfamily Verpertilioninae, Group Plecotini, Genus *Plecotus*, Subgenus *Corynorhinus* (Williams et al., 1970). The genus *Plecotus*, excluding *Idionycteris* (Williams et al., 1970), contains five extant species: *P. auritus*, *P. austriacus*, *P. rafinesquii*, *P. mexicanus*, and *P. townsendii*. Jones (1977) provided a key for the discrimination of these taxa. No subspecies are recognized (Handley, 1959).

DIAGNOSIS. Compared with geographically adjacent subspecies of *P. townsendii*, coloration of *P. mexicanus* is darker and with less contrast between bases and tips of dorsal hairs. Lengths of the tragus (<15 mm), skull (<15.9 mm), and auditory bullae (<4.0 mm) are less, the braincase is deeper (>5.4 mm), and the maxillary toothrow is relatively and actually shorter (<5.0 mm) as compared to *P. townsendii*. The rostrum is shorter (palatal length <5.2 mm), weaker, and more depressed, and I1 is more consistently bilobed (Handley, 1959; Tumlison, 1991). *Plecotus rafinesquii*, which is more similar to *P. mexicanus*, has ventral hairs with black or blackish bases and white or whitish tips resulting in considerable contrast, whereas ventral hairs of *P. mexicanus* have brownish bases and pale cinnamon tips. The median postpalatal process is typically triangular in shape whereas the process is variable but tends to be styliform in *P. mexicanus* (Handley, 1959).

GENERAL CHARACTERS. In common with other *Corynorhinus*, two large glandular lumps are present on the dorsal surface of the rostrum (Fig. 1). The pinnae are large and joined basally across the forehead. General coloration of adults is brown, with hairs at the posterior base of the large pinnae paler than on the rest of the dorsum. Dorsal color of immature individuals is smoky brown. The wide and deep braincase slopes upward abruptly above the short depressed rostrum (Fig. 2). External nares, viewed from above, are relatively small and angular in posterior outline. The median postpalatal process ranges from styliform to triangular, and the auditory bullae are relatively small in comparison to bullae of other *Corynorhinus* (usually <4.0 mm). I1 bears a prominent accessory cusp, I2 is simple, C1 is reduced in size, and P4 usually possesses a small anterointernal cingular cusp. The dental formula is i 2/3, c 1/1, p 2/3, m 3/3, total 36. Lobes of the presternum are slightly expanded. Cross-ribs on the interfemoral membrane average eight and the calcar is not keeled (Allen, 1916; Handley, 1959).

Average cranial measurements and range (in mm) for females and males, respectively, from throughout the range of the species are (Handley, 1959; Tumlison, 1991): greatest length, 15.3 (14.7–15.9), 15.1 (14.7–15.4); zygomatic breadth, 8.2 (7.8–8.6), 8.1

FIG. 1. Photograph of *Plecotus mexicanus* from Temazcaltzingo, state of México, México by O. Sánchez-Herrera.

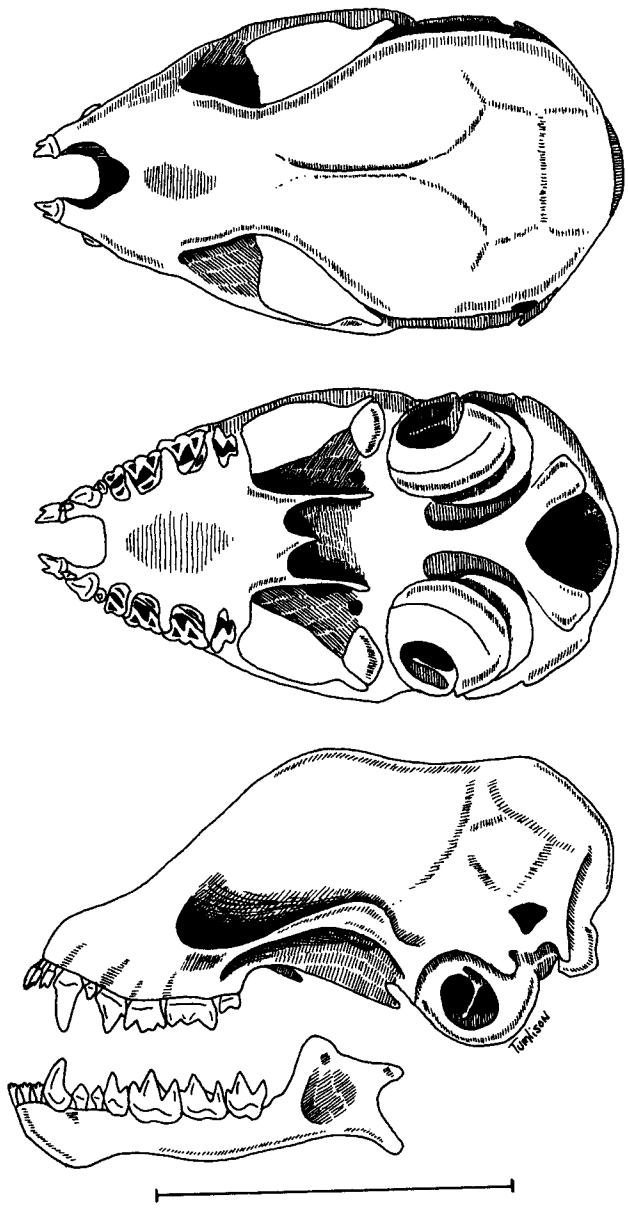

FIG. 2. Dorsal, ventral, and lateral view of the cranium, and lateral view of the mandible of *Plecotus mexicanus* (Texas Cooperative Wildlife Collection 27722, female, Piñal del Amoles, Querétaro, México). Greatest length of skull is 15.1 mm.

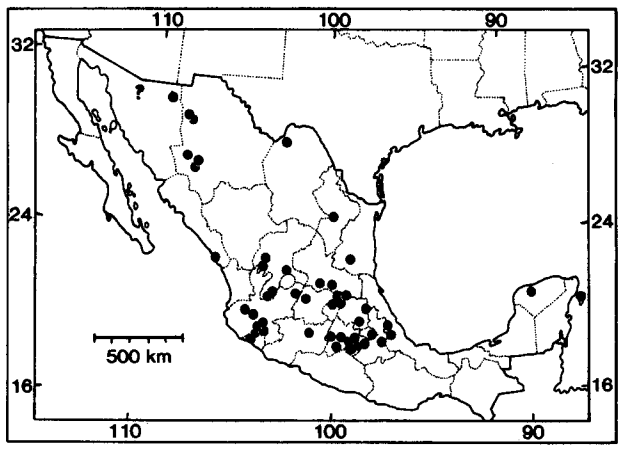

FIG. 3. Distribution of *Plecotus mexicanus* (adapted from Tumlison, 1991). Dots indicate locations from which specimens have been collected, question mark indicates an individual from Sonora where description fits *P. mexicanus* but for which there is no specimen.

(7.6–8.2); postorbital breadth, 3.4 (3.2–3.6), 3.4 (3.2–3.5); breadth of braincase, 7.6 (7.3–8.1), 7.5 (7.3–7.8); length of maxillary toothrow, 4.8 (4.6–5.0), 4.7 (4.7–4.8); breadth across upper molars, 5.7 (5.4–6.0), 5.6 (5.5–5.7). External measurements include (Handley, 1959): total length, 98 (90–103), 96 (92–100); length of tail, 48 (41–51), 46 (43–50); length of hind foot, 10 (9–13), 10 (9–11); length of ear from notch, 33 (30–36), 32 (29–35); length of tragus, 11 (11–13), 12 (11–15); length of forearm, 42.3 (39.3–45.2), 41.0 (39.7–43.1). Skulls of *P. mexicanus* tend to be the smallest among all species in the genus, but skins are intermediate in size between the smaller sympatric *P. townsendii pallescens* and the larger *P. townsendii australis* (Tumlison, 1991). Mass is not reported in the literature, but specimens examined by Tumlison (1991) provided the following data: mass was 6.8 g (n = 7; range 5.0–8.7) for males collected in May and June from Colima (Los Angeles County Museum, LACM 56072, 56073, 56074), México (American Museum of Natural History, AMNH 203934, 203935), Puebla (AMNH 203933), and Yucatán (AMNH 204984), and 8.6 g (n = 6; range 7.5–9.5) for females collected in August and October from Coahuila (United States National Museum, USNM 556414) and Hidalgo (KU 88414, 88416, 88419, 88421, 88422). A lactating female collected in May from Jalisco (The University of Kansas, KU 98740) weighed 10.9 g.

DISTRIBUTION. The Mexican big-eared bat is endemic to Mexico, inhabiting higher and more humid parts of the Sierra Madre Occidental, the transverse volcanic belt of central México, and the Sierra Madre Oriental (Fig. 3). Zonal distribution is mostly Transition and Upper Austral, ranging in elevation from 1,460 m to 3,200 m (Handley, 1959). *Plecotus mexicanus* is typically found at higher elevations than *P. townsendii*, but sampling at some locations produced both species (Handley, 1959; Tumlison, 1991). Range extensions have been reported for Tamaulipas (Mollhagen, 1971), Queretaro (Baumgardner et al., 1977), Coahuila (Wilson et al., 1985), Tlaxcala (Morales-Malacara and López-W., 1990), and Colima, Hidalgo, and Sinaloa (Tumlison, 1991). Koopman (1974) validated controversial records from Cozumel Island and Yucatán. A description of a specimen from Sonora (Burt, 1938), which would be the most northwestern record, was likely *P. mexicanus* (Handley, 1959).

FOSSIL RECORD. There is no fossil record for *P. mexicanus*, and only two fossil species of related taxa from North America: *Plecotus alleganiensis* from the middle Pleistocene of Maryland (Gidley and Gazin, 1933), and *P. tetralophodon* from the late Pleistocene of Nuevo León, México (Handley, 1955). The latter is thought to be more closely related to *P. mexicanus*, although probably not directly ancestral (Handley, 1959).

FORM AND FUNCTION. Description of skins, skulls, and teeth are provided in other sections. Molt was observed on the chest and shoulders of two adult females and on the belly of two immature specimens collected in Chihuahua during August (Handley, 1959). Although *P. mexicanus* is smaller than other members of the subgenus, its general form and function is probably very similar to that summarized for *P. townsendii* (Kunz and Martin, 1982) and *P. rafinesquii* (Jones, 1977).

ONTOGENY AND REPRODUCTION. Four nonpregnant females were collected in a mine in Jalisco on 1 September 1966, but three pregnant females were collected on 14 April 1967, each carrying one embryo with crown-rump lengths of 15, 17, and 18 mm (Watkins et al., 1972). Lactating females were taken in San Luis Potosí in July (Wilson et al., 1985) and in Jalisco in May (data from KU 98740). Testicular length of two males collected with the pregnant females in Jalisco was 5 mm (Watkins et al., 1972). Testes of three males collected in June from the states of México (AMNH 203934, 203935) and Puebla (AMNH 203933) averaged 7.7 mm in length (range 7–8) and testes of three males collected in July from Queretaro (Texas Cooperative Wildlife Collection 28626) and Chihuahua (KU 73591, 73593) averaged 10.7 mm (range 9–12) in length. Subadult specimens with epiphyses unossified were accompanied by adult females in late August and solitary immature specimens have been taken in mid-July (Handley, 1959).

ECOLOGY. Mexican big-eared bats typically are found in high (above 1,830 m), humid mountainous areas dominated by pine-oak forests (Handley, 1959), but specimens from transition zone habitats below such forests are known (Anderson, 1972; Matson and Patten, 1975). Specimens may be found in caves or mine shafts, sometimes with strong currents of air passing through (Anderson, 1972; Handley, 1959; Watkins et al., 1972), and have been taken in the summer flying about a rain pool in a forest opening (Davis, 1944). Larger series (n = 74) also have been taken in Veracruz from basaltic lava tubes 7.5–150 m from cave entrances (Hall and Dalquest, 1963). Populations are present throughout the year in some locations although numbers present may vary from a few during summer to over 500 during late winter (Morales-Malacara and López-W., 1990).

Bats associated with *P. mexicanus* at roost sites include *Desmodus rotundus* (Watkins et al., 1972), *Pipistrellus subflavus* (Hall and Dalquest, 1963), and *Myotis velifer* (Hall and Dalquest, 1963; Morales-Malacara and López-W., 1990).

Ectoparasites of *P. mexicanus* from a cave in Tlaxcala, Mexico (Morales-Malacara and Lopez-W., 1990) included the bat fly *Trichobius corynorhini* (Streblidae) and a flea (*Myodopsylla collinsi*). The single flea specimen was considered an incidental record because its normal host (*Myotis velifer*) was common in the cave. Several species of mites also were recorded: *Macronyssus longisetosus, M. unidens, Spinturnix* sp., *Pteracarus elegans, Acanthophthirius* (*Myotimyobia*) sp., and *Whartonia glenni.*

BEHAVIOR. *Plecotus mexicanus* has been found singly or in pairs hanging away from light 10.5–15.0 m from the entrances to caves in Tamaulipas (Mollhagen, 1971) and Veracruz (Hall and Dalquest, 1963). Adult males and females have been taken in the same cave in Veracruz in January and in Guanajuato in November (Handley, 1959).

At rest the long ears of *P. mexicanus* are bent spirally back and downward against the sides of the head like recurved horns, but on awakening the ears are extended (Handley, 1959; Villa-R., 1966). Eight hibernating specimens observed by E. A. Goldman hung by their feet from the roof of a cave and were separated by a distance of 2–4 m. Their eyes were closed, their bodies cold and stiff, and the wings hung close to the sides of the body (Handley, 1959). *Plecotus mexicanus* clings by the feet and thumbs with the back bowed, the head held against the chest, and the tail folded under the body, covering the abdomen (Hall and Dalquest, 1963).

Certain caves appear to be favored over others and daily movement occurs between caves, but migration is not known. Caves in Veracruz in which hibernation occurred were larger, deeper, colder, and damper than caves not used for hibernation. Fur of the hibernating bats was damp or wet (Hall and Dalquest, 1963).

REMARKS. The karyotype of *P. mexicanus* has not been reported, but karyotypes of *P. rafinesquii* and *P. townsendii* are identical (Baker and Mascarello, 1969; Williams et al., 1970). It is likely that the karyotype of *P. mexicanus* is identical to other *Corynorhinus*, and the acrocentric X chromosome may be a synapomorphic feature for *Corynorhinus* (Volleth, 1985).

Vernacular names include Allen's big-eared bat (after G. M. Allen who described the species) and Mexican big-eared bat (because the specific epithet refers to the type specimen collected in Mexico). *Idionycteris phyllotis* (Allen, 1916) is also referred to by these same common name (Czaplewski, 1983), likely because the synonomy of *I. phyllotis* includes the name *Idionycteris mexicanus* Anthony. Because both species were named by the same person, perhaps the vernacular Allen's big-eared bat should be discarded when referring to *P. mexicanus* and the name Mexican big-eared bat used. A logical vernacular for *Idionycteris phyllotis* is leaf-eared bat, to reflect the species name, or lappet-eared bat to indicate the diagnostic lappets located between the bases of the pinnae.

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