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Peromyscus furvus (Rodentia: Cricetidae)

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Abstract: *Peromyscus furvus* Allen and Chapman, 1897 is a cricetid rodent commonly called the blackish deermouse because of its characteristically dark pelage coloration. It is 1 of 56 species in the genus *Peromyscus* and is of large size compared with the majority of its congeners. Its distribution is restricted to moderate- to high-elevation cloud forests along the eastern slopes of the Sierra Madre Oriental in Mexico. The International Union for Conservation of Nature and Natural Resources' status was recently reassessed and set to "Data Deficient," although *P. furvus* has lost the majority of its natural habitat to deforestation. Sequence data indicate that *P. furvus* may be a composite taxon, with the southern population forming an independent evolutionary lineage.

Key words: blackish deermouse, cricetid, deforestation, endemic rodent, Mexico, Neotominae

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Peromyscus furvus J. A. Allen and Chapman, 1897
Blackish Deermouse

Peromyscus furvus J. A. Allen and Chapman, 1897:201. Type locality "Jalapa, Veracruz [Mexico]."

Peromyscus latirostris Dalquest, 1950:8. Type locality "Apetsco, 2,700 feet, near Xilitla, San Luis Potosi [Mexico]."

Peromyscus angustirostris Hall and Álvarez, 1961:203. Type locality "3 km. W of Zacualpan, 6,000 feet, Veracruz [Mexico]."

CONTEXT AND CONTENT. Order Rodentia, suborder Myomorpha, superfamily Muroidea, family Cricetidae, subfamily Neotominae, genus *Peromyscus* (Musser and Carleton 2005). The genus *Peromyscus* includes 56 nominal species (Musser and Carleton 2005) divided into 7 species groups (Carleton 1989). *Peromyscus furvus* is a member of the *P. furvus* species group, together with *P. mayensis* and *P. ochraventer* (Carleton 1989) and is monotypic (Huckaby 1980).

NOMENCLATURAL NOTES. Derivation of the specific epithet is from the Latin *furv* meaning swarthy (Jaeger 1966) or *furvus* meaning dark, dusky, or black (Brown 1954). This species has been treated as polytypic (Hooper 1968; Musser 1964) or monotypic (Carleton 1989; Hall 1981; Harris and Rogers 1999; Huckaby 1980). Monophyly of the *P. furvus* species group (sensu Carleton 1989) is not supported by sequence data and the evolutionary affinities of *P. furvus* relative to other species of *Peromyscus* remain uncertain (Bradley et al. 2007; Wade 1999).

DIAGNOSIS

Peromyscus furvus (Fig. 1) is one of the larger members of the genus *Peromyscus* (total length of adults rarely < 250 mm and greatest length of skull usually > 32.0 mm). Cranial features (Fig. 2) of *Peromyscus* are: "Skull very large in comparison with the external measurements of the animal, and very strong and heavy for a *Peromyscus*" (Allen and Chapman 1897:202). Skull is very similar to other members of the genus *Peromyscus* except for the rostrum, which is "very broad, inflated anteriorly, and distinctly bell-shaped, the breadth across the tip of nasals,

Fig. 1.—An adult female *Peromyscus furvus* from 5 km SE Jalapa, Veracruz, México. Photograph taken by DSR.

Fig. 2.—Dorsal, ventral, and lateral views of skull, and lateral view of mandible of an adult male *Peromyscus furvus* (Monte L. Bean Life Science Museum, Brigham Young University [BYU] 15815) from Rancho El Paraiso, 6 km SW Huauchinango, 2,000 m, Puebla, México. Greatest length of skull is 34.8 mm.

in very old specimens, equaling the interorbital breadth, instead of narrowing to about one-half this width, as in most species of the genus" (Allen and Chapman 1897:202). Nasals extend about 2 mm beyond the intermaxillary bones, palate has a thicker, upturned posterior margin, and palatine foramina are relatively broad (Allen and Chapman 1897).

Compared with other species, *P. furvus* resembles *P. californicus* (California deermouse) most closely, especially in external measurements. However, *P. furvus* possesses ears that are about one-third shorter than those of the California deermouse. *P. furvus* has a naked tail and darker pelage overall compared with the California deermouse, which has a relatively hairy tail and a more yellowish tone to pelage (Allen and Chapman 1897). With the exception of *Megadontomys cryophilus* (Oaxacan big-toothed deermouse) or *M. nelsoni* (Nelson's big-toothed deermouse), *P. furvus* can be distinguished easily from other *Peromyscus* with which it co-occurs (*P. aztecus*—Aztec deermouse, *P. boylii*—brush deermouse, *P. leucopus*—white-footed deermouse, and *P. pectoralis*—white-ankled deermouse) by its large size. *Megadontomys* can be distinguished from *P. furvus* by the presence of supraorbital ridging on the skull and a larger, thicker, and spinous glans penis (Allen and Chapman 1897; Hall 1981; Huckaby 1980). In addition, *Megadontomys* averages 22% larger in total length and 6% larger in length of skull than *P. furvus* (Huckaby 1980; Musser 1964).

Peromyscus furvus resembles members of the *P. mexicanus* species group (sensu Carleton 1989) but can be distinguished by characters including an hourglass-shaped interorbital region, expanded nasals, complex dentition, presence of pectoral mammae, and an expanded bacular tip. In Mexico, *P. furvus* is similar to *P. mexicanus* (Mexican deermouse) in size but is larger and darker (Fig. 1), with length of tail slightly longer than length of head and body in the majority of specimens (Hooper and Musser 1964; Huckaby 1973, 1980).

GENERAL CHARACTERS

The ears of *Peromyscus furvus* are large and membranous, tail is only sparsely haired, and pelage is wooly and lacks luster. Length of hair in middorsal area is 11 mm. Eye ring and surrounding area is black, and ears are dusky. Pelage on the dorsum and head is mixed black and snuff brown, giving the appearance of bister. Sides are snuff brown, feet are white, and underparts are whitish gray. Some adults possess a white tip on tail. Young *P. furvus* are fuscous-black above and fuscous on the sides (Dalquest 1953—see Ridgway 1912 for pelage color standards).

Largest individuals of *P. furvus* are from the northern part of its range (Xilitla, Veracruz) and populations from the middle portion of distribution (Metepec and Zacualpan in Hidalgo and Veracruz, respectively) are smallest overall. Mice from the southern area of distribution (Jalapa, Veracruz) are intermediate in size. Male *P. furvus* average 4% larger in external measurements and 2% larger in cranial measurements than females. Clinal variation exists with respect to shape of sutures separating frontal bones from parietals. Suture is U-shaped in all 12 specimens from Xilitla, U-shaped in 41 specimens, and V-shaped in 7 mice from Metepec and Zacualpan, whereas U- and V-shaped suture configurations are present in equal frequencies in mice ($n = 24$) from Jalapa, Veracruz, Mexico (Hall 1968).

The mean and range (in parentheses) of standard external measurements (mm) of 14 males and 8 females,

respectively, from the type locality of *P. furvus* were: total length 263 (248–281) and 250 (243–260), length of tail 131 (123–145) and 125 (120–130), length of hind foot 27.9 (26.0–29.0) and 27.3 (26.0–28.0), and length of ear 21.9 (20.0–23.0) and 21.5 (21.0–22.0—Allen and Chapman 1897). The mean and range (in parentheses) of external and cranial measurements (mm) from a series of specimens collected from Xilitla, Veracruz were: length of head and body (n = 13), 128 (114–152); length of tail (n = 13), 131 (112–142); length of hind foot (n = 9), 23.4 (22.0–25.0); length of skull (n = 14), 34.5 (31.9–36.8); length of rostrum (n = 14), 10.8 (9.4–11.9); length of braincase (n = 14), 15.7 (15.2–16.2); width of interorbital constriction (n = 14), 5.4 (5.1–5.7); width of braincase (n = 14), 14.4 (13.6–14.8); length of incisive foramen (n = 14), 7.0 (6.4–7.8); length of molar toothrow (n = 14), 5.1 (4.9–5.3); length of interpterygoid fossa (n = 14), 5.7 (4.8–6.3); width between upper molars (n = 14), 3.4 (3.2–3.7); width of interpterygoid fossa (n = 14), 2.2 (1.9–2.6); width of 1st upper molar (n = 14), 1.5 (1.4–1.6—Huckaby 1980). Measurements (mm) of an adult, female *P. furvus* from Puerto de la Soledad, Oaxaca, Mexico, originally identified as *P. melanocarpus* (black-wristed deermouse) were as follows: total length, 220.0; length of tail, 115.0; length of hind foot, 25.0; greatest length of skull, 32.4; condylobasal length, 29.0; length of palate, 4.4; length of nasals, 12.7; width of interorbital constriction, 5.3; width of zygomatic arch, 15.4; width of mastoid, 13.0; length of maxillary toothrow, 4.7 (Goodwin 1969).

DISTRIBUTION

Range limits are not definitely known. *Peromyscus furvus* has been collected along the eastern slopes of the Sierra Madre Oriental from southeastern San Luis Potosí to northern Oaxaca, México (Fig. 3; Avila-Valle 2005; Ramírez-Pulido et al. 2001). Collecting localities range in elevation between 1,200 and 2,200 m in cool, humid forests (Hall 1968; Huckaby 1973). The canyon of the Rio Santo Domingo-Quiotepec in northern Oaxaca, Mexico serves to limit dispersal southward (Huckaby 1980). No fossils are known.

FORM AND FUNCTION

A study of nongeographic morphological variation in *Peromyscus furvus* from the central portion of its range documented significant variation among age classes for the majority of the 5 external and 16 cranial characters. Adult males typically were larger than adult females, but only several characters differed significantly between the sexes (Martínez-Coronel et al. 1997). The dental formula of *P. furvus*, like most other species in the superfamily Muroidea, is i 1/1, c 0/0, p 0/0, m 3/3, total 16. Upper incisors lack grooves and molars are bunodont. M1 and M2 have single,

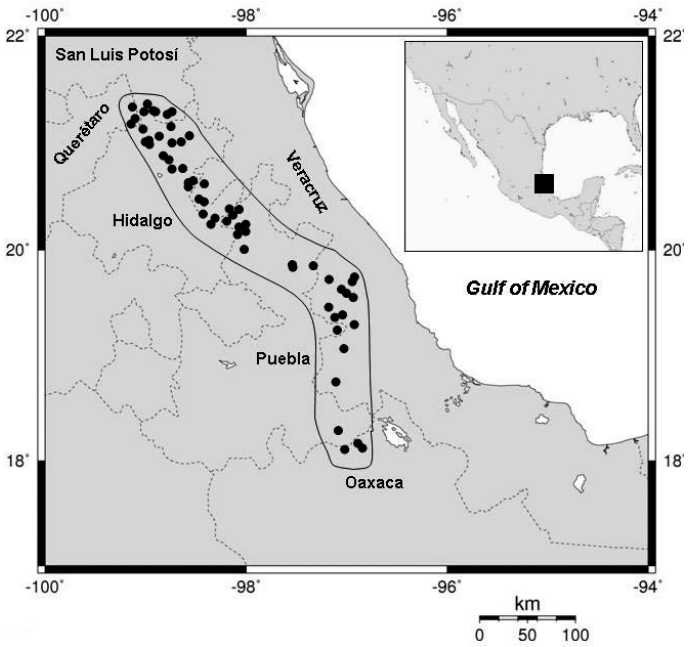

Fig. 3.—Geographic distribution of *Peromyscus furvus* in the Sierra Madre Oriental, México. Dots indicate collecting localities redrawn from Ramírez-Pulido et al. (2001) and Aliva-Valle (2005).

large lingual roots, whereas the labial root for M1 is absent. In the lower jaw, m1 has no labial or lingual roots; m2 and m3 both have 2 roots. The entoconids and hypoconids are greatly reduced on m3 and wear to a C-shape. The m3 is 24–29% of the length of the molar toothrow (Carleton 1980).

General features of the skull include expanded nasals, hourglass-shaped interorbital region, well-developed lophs that extend from the mure to the style on the molars, and anterior cingulum of M1 possessing a small style positioned anterior to the cleft between the 2 cusps (Hooper 1957a; Huckaby 1980). Stapedial and sphenofrontal foramina are present in *P. furvus*, as is the foramen ovale. The postglenoid foramen and the subsquamosal foramen both are present and relatively large. The squamosal is grooved as a result of the presence of the ophthalmic artery. The spenopalatine vacuities are relatively elongate and extend $>$ 50% of the length of the presphenoid bone. Posterolateral palatal pits either are absent, or if present, consist of 1 or 2 small foramina. Paired palatine foramina are located at the junction of the palatine and maxillary bones. Occasionally, the palatine foramina are comprised of a pair of relatively large foramina together with 1 or 2 small openings. The interorbital region is smooth and lacks temporal ridges. The zygoma are unnotched, postorbital processes are absent, and the angular processes of the dentary are not deflected. In the hyoid apparatus, the entoglossal process of the basihyal bone is small and knob-like and the thyrohyal bone greater or equal to the length of the basihyal. In the maleus, the manubrium forms a right angle with the head and the

orbicular apophysis is present. The mastoid bullae are relatively small and unmodified and the accessory tympanum is small. The tympanic bullas also are relatively small. The tentorium cerebellum is configured as a low crest (Carleton 1980).

Peromyscus furvus has a postcranial skeleton consisting of 13 thoracic, 6 lumbar, and 32–36 caudal vertebrae. The 2nd thoracic vertebra has a well-developed neural spine (Carleton 1980). The humerus possesses an entepicondylar foramen (Rinker 1960). The tuberculum of the 1st rib is narrow and articulates with the transverse process of the 1st thoracic vertebra. The calcaneum has a broad and shelflike trochlear process and the scapulae possess supraspinous and infraspinous fossa. Between 37% and 41% of the tibia is fused with the fibula (Carleton 1980).

Internal cheek pouches are not found (or are poorly developed) in *P. furvus*. The soft palate is characterized by an anterior ridge that is complete and with high relief and with 3 complete and 4 incomplete palatal ridges (Carleton 1980). The stomach is bilocular and discoglandular and possesses an incisura angularis (Carleton 1973). A sulcus on the greater curvature of the stomach is absent. A distinct saclike gall bladder, positioned between the cystic lobes of the liver, is present. The 1st section of the large intestine has either none or 1 to 2 coils and the cecum is moderate in length and internally simple (Carleton 1980).

The glans penis of *P. furvus* is relatively long and distinguished by a short protractile tip, spinous, with 2 broad dorsal lappets (Hooper 1958; Huckaby 1980). The diameter of the phallus is $\leq$ 15% of its length. Spines are absent from the internal crater wall and the position of the urinary meatus is subterminal. A urethral process, dorsal papilla, lateral bacular mounds, and a crater hood all are absent (Carleton 1980). The baculum is relatively broad with a distal tip that is slightly upturned and enlarged (Huckaby 1980). The shaft is relatively long and ends in a broad knob tipped with a small piece of cone-shaped cartilage (Hooper 1958). The morphology of the base of the baculum varies within samples (Huckaby 1980). Overall, the morphology of the baculum is "seen nowhere else in the subgenus [*Peromyscus*]" (Huckaby 1973:83).

Male accessory reproductive glands in *P. furvus* include medial and lateral ventral prostates as well as dorsal and anterior prostates, bulbourethrals, ampullaries, J-shaped vesiculars. Ampullae of ductus deferens are absent as are preputials (or are not visible macroscopically—Carleton 1980).

The morphology of the male genital tract was examined in 5 *P. furvus* from Puebla (Linzey and Layne 1969). Mean measurements (mm; length by width unless otherwise stated) were as follows: testis, 13.0 by 6.9; ampullary, 2.4 by 3.2; vesicular, 7.1 by 2.4; anterior prostate, 4.2 by 1.8; dorsal prostate, 6.0 by 3.2; ventral prostate, 4.3 by 2.0; bulbourethral, 3.7 by 4.1; greatest length of deferent duct, 18.8; greatest length of urethra, 30.0.

The morphology of spermatozoa in *P. furvus* was examined in 10 specimens from the vicinity of Huauchinango, Puebla, Mexico. Compared with other species of *Peromyscus,* the hook on the sperm head is relatively long with a well-defined dorsal eave. Midpiece attachment site varied from central to eccentric. Mean measurements ($\pm$ *SE* [µm] in parentheses) were head length, 5.3 ($\pm$ 0.07); head width, 2.6 ($\pm$ 0); midpiece length; 17.1 ($\pm$ 0.11); and tail length, 54.8 ($\pm$ 2.31—Linzey and Layne 1974).

The plantar surface is densely furred to the thenar pad in *P. furvus*. The 2nd–4th interdigital plantar pads are positioned close together, but the 1st is set farther back toward the heel and is not opposite the 4th. The thenar and hypothenar pads also are positioned posteriorly and are strongly staggered. There are 2 pairs of inguinal and 1 pair of axillary mammary glands (Carleton 1980).

ONTOGENY AND REPRODUCTION

In the latter part of October, *Peromyscus furvus* of various ages and reproductive condition (scrotal and nonscrotal males, pregnant, lactating and nonlactating females) were collected near Jico, Veracruz, (Hall and Dalquest 1963) and young, half-grown individuals were taken in March, April, July, and September from the vicinity of Xilitla, San Luis Potosí. This indicates that *P. furvus* may have a prolonged breeding season or breed throughout the year (Dalquest 1953; Hall and Dalquest 1963). Each of the 2 pregnant females collected in the vicinity of Jico, Veracruz had 2 embryos (Hall and Dalquest 1963). However, none of the female *P. furvus* obtained in July in the vicinity of Jalapa, Veracruz was pregnant or lactating (Davis 1944).

ECOLOGY

Information about the life history of *Peromyscus furvus* is limited. This species is known from the Humid Upper Tropical Subzone (Goldman 1951). In a study of rodent species along a transect in the Sierra Mazateca, Oaxaca, *P. furvus* had a limited elevational distribution in both the wet and dry seasons (Sánchez-Cordero 2001). In a study of cloud forest remnants in central Veracruz, *P. furvus* was collected more frequently in traps located farther from the forest edge and was the most abundant species collected (61% of the 694 captures—López-Barrera et al. 2007) and may serve as a "detector species" for conserved cloud forest sites (Tejeda-Cruz et al. 2008:278). In the vicinity of Metepec, Hidalgo, individuals were trapped near rotten logs, alongside a road fill, and around exposed tree roots. Habitat consisted of "broadleaf trees, predominantly bromeliad-covered oaks, and scattered pines" with a ground cover of shrubbery, ferns, and herbaceous vegetation (Musser 1964:10). From Veracruz, *P. furvus* was taken in habitat consisting of

long-needled pine near rocks and seeps, inside caves, or ''along rocky cliffs, in canyons, in the forest, and in coffee thickets and brushy places'' (Hall and Dalquest 1963:308). *P. furvus* was collected in a pine, oak, and alder cloud forest in the vicinity of Huauchinango, Puebla. Understory was comprised of blackberry, ferns, pokeweed (*Phytolacca*), and mosses. Stomach contents of mice taken here contained fruits of *Phytolacca. P. furvus* also was taken in a moister, broadleaf forest in the vicinity of Huauchinango. Here mosses and liverworts were numerous on the ground, rocks, and trees. Mice trapped at this locality were consuming blackberries (Hooper 1957b).

Small mammals taken in association with *P. furvus* from Jalapa and Jico, Veracruz include *Handleyomys melanotis* (black-eared Handley's mouse; formerly *Oryzomys*), *H. rhabdops* (highland Handley's mouse), *Marmosa mexicana* (Mexican mouse opossum), *Nyctomys sumichrasti* (Sumichrast's vesper rat), *Oryzomys couesi* (Coues' oryzomys), Aztec deermouse, white-footed deermouse, *Reithrodontomys megalotis* (western harvest mouse), *R. mexicanus* (Mexican harvest mouse), *R. sumichrasti* (Sumichrast's harvest mouse), *Sciurus deppei* (Deppe's squirrel), and *S. aureogaster* (red-bellied squirrel—Allen and Chapman 1897; Davis 1944; Hall and Dalquest 1963). *P. furvus* also co-occurs with *Handleyomys chapmani* (Chapman's Handley mouse), *Oligoryzomys fulvescens* (fulvous colilargo), *R. fulvescens* (fulvous harvest mouse), *P. beatae* (Orizaba deermouse), and *Sorex saussurei* (Saussure's shrew) near Banderillas, Veracruz (Ramírez-Pulido et al. 2004). In a study of forest edge effects in central Veracruz, *P. furvus* was collected with *Cryptotis mexicana* (Mexican small-eared shrew), *H. alfaroi* (Alfaro's Handley mouse), *Microtus quasiater* (Jalapan vole), fulvous colilargo, white-footed deermouse, fulvous harvest mouse, and Mexican harvest mouse (López-Barrera et al. 2007). In the vicinity of Tezuitlan and Huauchinango, Puebla, *P. furvus* was collected with highland Handley's mouse, Nelson's big-toothed deermouse, Aztec deermouse, and *Sorex macrodon* (large-toothed shrew—Heaney and Birney 1977; Hooper 1957b; Musser and Carleton 2005). Rodents that occur with *P. furvus* from the vicinity of Metepec, Hidalgo include: highland Handley's mouse, Aztec deermouse, and Sumichrast's harvest mouse (Musser 1964; Musser and Carleton 2005). Small mammals taken with *P. furvus* near Tlanchinol, Hidalgo include *Cryptotis obscura* (grizzled Mexican small-eared shrew), *Didelphis marsupialis* (common opossum), and Aztec deermouse (Cervantes et al. 2002).

On the basis of specimens housed in the Colección de Mamíferos de la Universidad Autónoma Metropolitana-Unidad Iztapalapa, the number of species of *Peromyscus* that occur sympatrically with *P. furvus* ranges from 1 to 3. *P. furvus* occurs in sympatry with *P. levipes* (nimble-footed deermouse) from 2 localities in Hidalgo, 1 locality in Puebla, and 3 localities in Veracruz, with white-footed deermouse from 2 localities in Hidalgo and 1 in Puebla, with *P. difficilis* (southern rock deermouse) from a locality in Hidalgo, with Aztec deermouse from 1 locality in Hidalgo, 1 in Puebla, and 1 in Veracruz, with Mexican deermouse from a locality in Puebla, with Orizaba deermouse from 2 localities in Veracruz, with nimble-footed deermouse and *P. maniculatus* (North American deermouse) from a locality in Hidalgo, with white-footed deermouse and Mexican deermouse from 1 locality in Puebla, with Aztec deermouse and white-footed deermouse from a locality in Puebla and in Veracruz, with white-footed deermouse and nimble-footed deermouse from 2 localities in San Luis Potosí, with southern rock deermouse, white-footed deermouse, and nimble-footed deermouse from a locality in Hidalgo, with Aztec deermouse, nimble-footed deermouse, and Mexican deermouse from a locality in Oaxaca and 1 in San Luis Potosí, and with Aztec deermouse, Orizaba deermouse, and nimble-footed deermouse from a locality in Veracruz (Ramírez-Pulido et al. 2001).

The ecological niche occupied by the 3 genetic clades of *P. furvus* (Harris et al. 2000) was modeled as a way to estimate ecological differentiation among the 3 phylogroups. Differences in the ecological niches of these 3 phylogroups were due primarily to variation in temperature variables including annual mean, isothermality, and maximum of the warmest month, as well as means of the wettest, driest, and warmest quarters. Both the northern and southern phylogroups displayed significant ecological differentiation from each other and from the central phylogroup (Martínez-Gordillo et al. 2009).

Specimens of *P. furvus* from Jalapa and Jico, Veracruz were relatively parasite free with the exceptions of a ''tapeworm, in a cyst under the skin of the neck'' and several ''tiny, hard mites'' (Hall and Dalquest 1963:309). Another ectoparasite associated with *P. furvus* includes a Siphonaptera (family Ctenophthalmidae, *Ctenophthalmus pseudagyrtes*—Morrone et al. 2000). *P. furvus* is a potential reservoir for *Leishmania* (Stephens et al. 2009).

GENETICS

The diploid number (2n) of *Peromyscus furvus* is 48 with a fundamental number (FN) of 58 (Smith et al. 1986). Compared with the proposed primitive karyotype for *Peromyscus* (2n = 48, FN = 52), which consists of all acrocentric autosomes except for numbers 1, 22, and 23 (Greenbaum and Baker 1978), *P. furvus* possesses additional inversions in chromosomes 2, 3, and 9. The short arm of the X chromosome and the entire Y chromosome are heterochromatic, whereas C-band-positive material is confined to the centromeric regions of all autosomes (Smith et al. 1986).

Seven populations of *P. furvus* were assayed for variation at 33 presumptive protein loci. Twenty-four loci were polymorphic in 1 or more populations and mean heterozygosity per locus was 0.03. The majority of polymorphic loci deviated from Hardy–Weinberg equilibrium by a deficiency

of heterozygotes, indicating inbreeding (Harris and Rogers 1999). Genetic distance values (Rogers 1972) among 7 populations of *P. furvus* ranged from 0.074 to 0.201 and population subdivision, as evidenced by mean F_{ST}, was high (Harris and Rogers 1999). Allozyme data for *P. furvus* reported by Harris and Rogers (1999) were tested for evidence of selection on protein polymorphism and no significant differences from expected distributions were observed (Storz and Nachman 2003).

DNA sequence variation in a 719-base-pair (bp) fragment of the mitochondrial cytochrome *b* gene was examined among 8 populations of *P. furvus*. Twenty-four unique haplotypes were identified among the 54 individuals assayed. Genetic distances (Tamura and Nei 1993) ranged from 0 to 0.078 substitutions per site. The sample from northern Oaxaca was the most distinctive, genetically (Harris et al. 2000). Analysis of 4 mitochondrial genes (cytochrome *b,* ND3, DN4L, and ND4) revealed no haplotype differences in 2 individuals of *P. furvus* from Veracruz, Mexico (Wade 1999). A total of 819 bp (287 bp—ND3 gene, 68 bp—tRNA-Arg gene, 298 bp—ND4L gene, and 180 bp—1st portion of ND4 gene) for 19 *P. furvus* representing 9 localities was sequenced. The 2 localities from Oaxaca were the most divergent genetically and the samples from San Luis Potosí also formed a group separated from the remaining localities (Avila-Valle 2005). Therefore, *P. furvus* as currently defined is a composite taxon.

CONSERVATION STATUS

The International Union for Conservation of Nature and Natural Resources lists *Peromyscus furvus* as ''Data Deficient'' (Castro-Arellano and Vázquez 2008) and this species is not considered endangered by the Federal Republic of Mexico (Norma Oficial Mexicana 2002). However, *P. furvus* has lost $>$ 50% of its potential distribution (Sánchez-Cordero et al. 2005) because of deforestation. Populations from localities in northern Oaxaca likely represent an undescribed species (Avila-Valle 2005; Harris and Rogers 1999; Harris et al. 2000). These populations fall within the Tehuacán-Cuicatlán Biosphere Reserve. Unfortunately, this reserve is not strictly protected (Illoldi-Rangel et al. 2008) and Oaxaca is experiencing high rates of deforestation (Velázquez et al. 2003), so the long-term persistence of this lineage is precarious.

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