



10-8-2009

## New record and southern range extension for the Mearn's grasshopper mouse (*Onychomys arenicola* Mearns, 1896) in Veracruz, Mexico

Alvar González-Christen  
*Universidad Veracruzana, Veracruz, México, gonalvar@gmail.com*

Christian Alejandro Delfín-Alfonso  
*Instituto de Ecología, Veracruz, México*

Alberto González-Romero  
*Instituto de Ecología, Veracruz, México*

Follow this and additional works at: <https://scholarsarchive.byu.edu/wnan>

### Recommended Citation

González-Christen, Alvar; Delfín-Alfonso, Christian Alejandro; and González-Romero, Alberto (2009) "New record and southern range extension for the Mearn's grasshopper mouse (*Onychomys arenicola* Mearns, 1896) in Veracruz, Mexico," *Western North American Naturalist*. Vol. 69 : No. 3 , Article 14.  
Available at: <https://scholarsarchive.byu.edu/wnan/vol69/iss3/14>

This Note is brought to you for free and open access by the Western North American Naturalist Publications at BYU ScholarsArchive. It has been accepted for inclusion in Western North American Naturalist by an authorized editor of BYU ScholarsArchive. For more information, please contact [scholarsarchive@byu.edu](mailto:scholarsarchive@byu.edu), [ellen\\_amatangelo@byu.edu](mailto:ellen_amatangelo@byu.edu).

NEW RECORD AND SOUTHERN RANGE EXTENSION FOR THE  
MEARN'S GRASSHOPPER MOUSE (*ONYCHOMYS ARENICOLA*  
MEARNS, 1896) IN VERACRUZ, MEXICO

Alvar González-Christen<sup>1</sup>, Christian Alejandro Delfín-Alfonso<sup>2</sup>, and Alberto González-Romero<sup>3</sup>

ABSTRACT.—Mearn's grasshopper mouse (*Onychomys arenicola*) in Mexico is found primarily in the central and northern states. This is the first report of the genus *Onychomys* in the state of Veracruz, based on 7 captured specimens (3 collected). This finding extends the species' known distribution by approximately 470 km east-southeast. In addition, this record increases the alpha diversity of terrestrial mammals for the state of Veracruz to 192 species.

*Key words:* grasshopper mouse, *Onychomys arenicola*, distribution, record, Perote, Veracruz, Mexico.

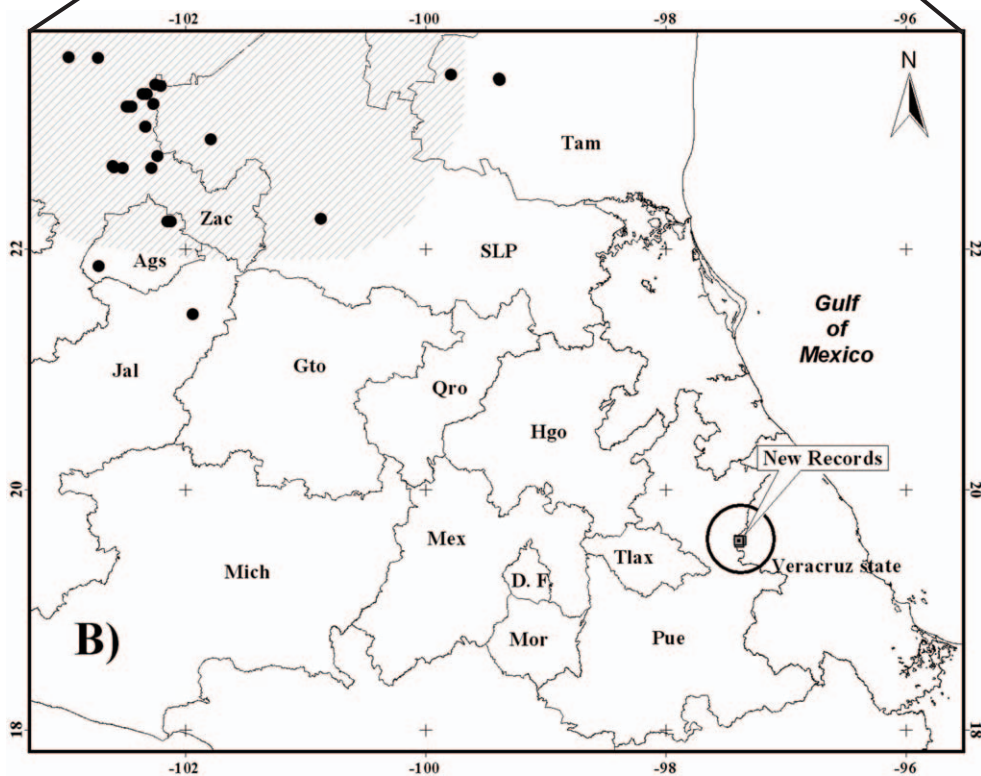
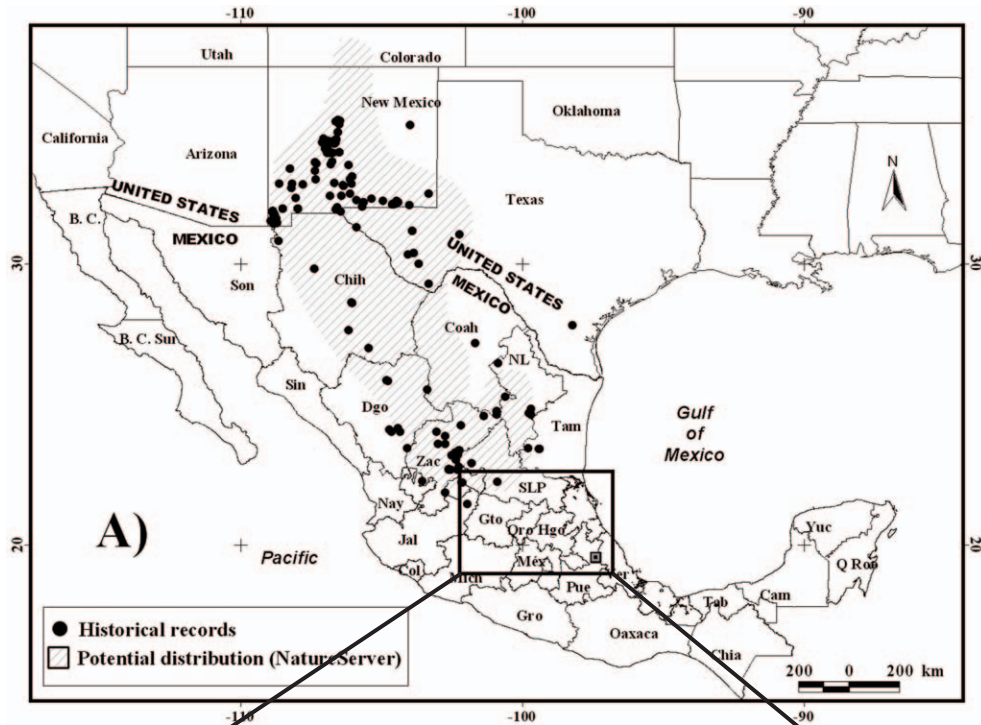
Mearn's grasshopper mouse (*Onychomys arenicola* Mearns, 1896) is a polytypic species represented in Mexico by the subspecies *O. a. canus* Merriam, 1904 and *O. a. surrufus* Hollister, 1914 (Ramírez-Pulido et al. 2000, Musser and Carleton 2005). Historically it has been reported infrequently; hence its presence in scientific collections is relatively uncommon (Hinesley 1979, Musser and Carleton 1993, Davis and Schmidly 1997, Clary et al. 1999). In Mexico, there are records of *O. arenicola* in the Chiuhahuan Desert and in the states of Durango, Jalisco, San Luis Potosí, Zacatecas, Nuevo León, and Tamaulipas. The southernmost state in which both the species and the genus have been recorded is San Luis Potosí (Riddle and Honeycutt 1990, López-Wilchis and López-Jardines 1998, Ramírez-Pulido et al. 2000, 2005, Villa and Cervantes 2003, Godínez 2005). Mearn's grasshopper mouse inhabits areas of low vegetation on sandy or gravel-covered arid land, where the vegetation is mainly xerophytic shrubs, mesquite, or other shrub species typical of the central plateau of Mexico (Davis and Schmidly 1997, Godínez 2005). Although the species has a wide distribution in the aforementioned areas of Mexico, it has not been previously reported in the central southern states of Querétaro, Guanajuato, Hidalgo, Puebla, Tlaxcala, or Veracruz, even though the habitat preferred by the species occurs in these states.

From 2000 to 2005, 7 specimens belonging to the genus *Onychomys* were captured in Sherman traps at 5 sites in the Perote Valley, central Veracruz. The sites are 17 km northwest of Cofre de Perote National Park and very close to the village of El Frijol Colorado in the municipality of Perote (Fig. 1). The climate at the collecting sites is classified as BS<sub>1</sub>kw(i')g, the most humid of the semiarid climates (Soto and Angulo 1990). The dominant vegetation is a desert scrub association of *Nolina parviflora*, *Yucca periculosa*, *Agave obscura*, and *Distichlis spicata* that has been gradually replaced by grassland (*Bouteloua hirsuta* and *Suaeda nigra*) and crops. Mean annual temperature is 13.5 °C but drops to an average of -3 °C during the coldest month (González-Christen et al. 2006). Mean annual precipitation is 380 mm, and the average elevation is 2456 m above sea level. Three specimens were sacrificed, and their skins and skulls were deposited as voucher specimens (Ramírez-Pulido et al. 1989) in the mammal collection (VER-MAM-191-10-06) at the Institute of Biological Research, University of Veracruz, Xalapa (Cat. IIB-UV 2594, 2767, 2604). Two specimens were marked and released in situ; 2 others were photographed and released in situ for the photographic catalog (Botello et al. 2007) of the university's collection (IIB-UV 0001f, 0002f; Table 1).

<sup>1</sup>Curator, Laboratorio de Zoología, Instituto de Investigaciones Biológicas, Universidad Veracruzana Avenida Dr. Luís Castelazo S/N, Col. Industrial Animas, C. P. 91190, Km. 3.5 Carretera Xalapa-Veracruz, A. P. 294 Xalapa, Veracruz, Mexico. E-mail: agonzalez@uv.mx

<sup>2</sup>Departamento de Ecología Aplicada, Instituto de Ecología, A.C. Km. 2.5 Antigua Carretera a Coatepec No. 351 Congregación "El Haya," C. P. 91070, A. P. 63 Xalapa, Veracruz, Mexico.

<sup>3</sup>Departamento de Biodiversidad y Ecología Animal, Instituto de Ecología, A.C. Km. 2.5 Antigua Carretera a Coatepec No. 351 Congregación "El Haya," C. P. 91070, A. P. 63 Xalapa, Veracruz, Mexico.



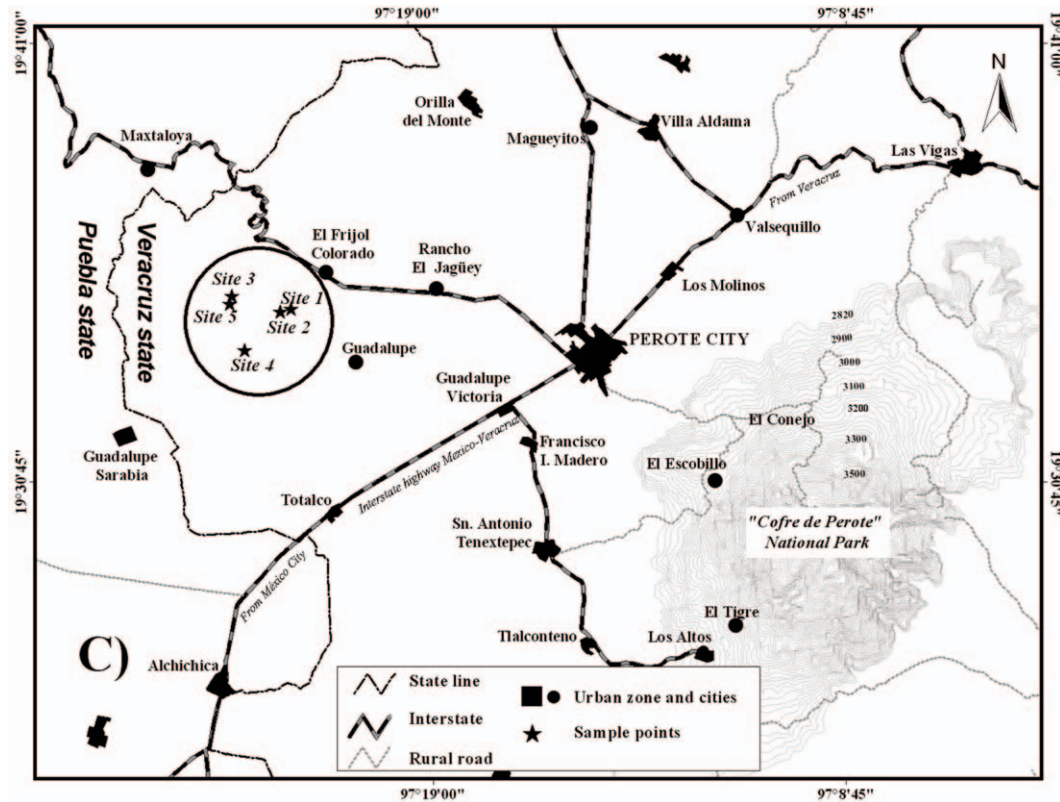


Fig. 1. *Onychomys arenicola* in North America (NatureServe 2004); A (facing page), potential distribution and historical records (biodiversity occurrence data provided by and accessed through the GBIF data portal [GBIF 2007]); B (facing page), records closest to Veracruz; and C (above), collecting sites in central Veracruz, Mexico.

TABLE 1. Collecting sites for *Onychomys arenicola* in the Perote Valley, Veracruz, Mexico. Catalog number (Cat).

Site	Cat.	Date	Latitude	Longitude	Localities	Type of record
1	2604	20 Sep 2000	19°34'45.29"	97°21'57.76"	1.37 km SW of El Frijol Colorado	Voucher specimen
1	No data	20 Sep 2000	19°34'45.29"	97°21'57.76"	1.37 km SW of El Frijol Colorado	Marked/released
2	2594	14 Apr 2000	19°34'50.74"	97°21'42.50"	1.80 km SW of El Frijol Colorado	Voucher specimen
2	No data	16 Apr 2000	19°34'50.74"	97°21'42.50"	1.80 km SW of El Frijol Colorado	Marked/released
3	2767	29 Mar 2001	19°35'08.47"	97°23'05.95"	3.57 km WSW of El Frijol Colorado	Voucher specimen
4	0001f	06 Oct 2004	19°33'52.01"	97°22'47.56"	4.01 km SW of El Frijol Colorado	Photograph/released
5	0002f	06 Oct 2004	19°34'56.82"	97°23'08.70"	3.65 km WSW of El Frijol Colorado	Photograph/released

We took 5 body measurements and 20 cranial and jaw measurements of the voucher specimens (Table 2) using a Mitutoyo digimatic caliper (precision 0.01 mm; Gaona 1997). The specimens were identified as *O. arenicola* using identification keys and a specialized bibliography (Hinesley 1979, Hall 1981, Davis and Schmidly 1997). These new records for *O. arenicola* extend the known distribution of the species toward the central region of the state of Veracruz, as far west as its border with the state

of Puebla (Fig. 1). The previous southernmost collecting site is 470 km west-northwest (straight-line distance) from the new record in Veracruz. There, 14 specimens were collected 16 km northeast of San Luis Potosí in the municipality of Soledad de Graciano Sánchez (GBIF 2007).

The occurrence of *O. arenicola* in the state of Veracruz increases the cumulative alpha diversity of terrestrial mammals in that state to 192 species (Gaona et al. 2003, González-Christen



TABLE 2. Cranial and jaw measurements of *Onychomys arenicola* from the Perote Valley, Veracruz, Mexico. Measurements are in millimeters for lengths and in grams for weights. Catalog number (Cat.), total length (AL), tail length (TL), hind foot length (FL), ear length (EL), weight (W), greatest length of skull (GLS), condylobasal length (CBL), palatal length (PL), nasal length (NL), rostral length (RL), mandible length (ML), mandibular tooth row (MTR), maxillary tooth row (MTR), frontal bone length (FBL), incisive foramina length (IFL), anterior nasal width (ANW), posterior nasal width (PNW), zygomatic width (ZW), breadth of braincase (BB), least interorbital breadth (LIB), frontal bone width (FBW), breadth across molars (BAM), height of braincase (HBC), height of mandible (HM), and height of rostrum (HR).

Cat.	AL	TL	FL	EL	W	GLS	CBL	PL	NL	RL	ML	MTR	MR	FBL	IFL	ANW	PNW	ZW	BB	LIB	FBW	BAM	HBC	HM	HR
2594 ♀	152	55	22	20	—	26.42	25.97	11.41	10.35	7.99	13.27	3.94	3.89	4.4	5.16	2.6	3	13.5	12.69	4.75	7.45	4.71	9.63	6.18	4
2604 ♂	149	51	23	20	19.4	26.66	25.38	11.09	10.47	7.08	12.87	3.91	3.78	3.08	5.63	2.59	2.48	13.1	12.84	4.76	8.07	4.68	9.25	6.32	3.36
2767 ♀	130	45	20	17	25	26.4	25.21	12.45	10.78	8.12	10.78	4.14	4.13	4.27	4.63	2.12	2.84	12.9	12.01	4.68	8.82	4.33	9.22	5.61	3.6

et al. 2002, 2006). The presence of Mearn's grasshopper mouse in central Veracruz merits further research. In addition to conducting genetic studies on the population, it is also important to define the population's geographical distribution (Musser and Carleton 2005). Increased collection effort is recommended for the states of Querétaro, Puebla, Tlaxcala, and Veracruz; this effort would produce records that would be helpful in defining the ecological niche of the Mearn's grasshopper mouse (Anderson and Martínez-Meyer 2004), and this, in turn, would facilitate identification of areas critical to its conservation and management.

#### LITERATURE CITED

- ANDERSON, R.P., AND E. MARTÍNEZ-MEYER. 2004. Modeling species' geographic distributions for preliminary conservation assessments: an implementation with the spiny pocket mice (*Heteromys*) of Ecuador. *Biological Conservation* 116:167–179.
- BOTELLO, E., G. MONROY, P. ILLOLDI-RANGEL, I. TRUJILLO-BOLIO, AND V. SÁNCHEZ-CORDERO. 2007. Sistematización de imágenes obtenidas por fototrampeo: una propuesta de ficha. *Revista Mexicana de Biodiversidad* 78:207–210.
- CLARY, M.L., D.M. BELL, C.W. EDWARDS, T.W. JOLLEY, O. KNYAZHNITSKIY, N. LEWIS-ORITT, S.J. MANTOOTH, L.L. PEPPERS, I. TIEMANN-BOEGE, F.D. YANCY, II, ET AL. 1999. Checklist of mammals from twelve habitat types at Fort Bliss Military Base; 1997–1998. *Occasional Papers of the Museum of Texas Tech University* 192: i + 1–16.
- DAVIS, W., AND D. SCHMIDLY. 1997. The mammals of Texas, online edition: Mearn's grasshopper mouse. Available from: <http://www.nsr1.ttu.edu/tmot1/onycaren.htm> [accessed 28 May 2007].
- GAONA, S. 1997. Variación no geográfica de *Peromyscus difficilis* (Rodentia: Muridae) en la región noroeste de la Cuenca Oriental en Puebla y Veracruz, México. Pages 135–156 in J. Arroyo-Cabrales and O. Polaco, editors, *Homenaje al Profesor Ticul Álvarez*. Instituto Nacional de Antropología e Historia, Colección Científica, México.
- GAONA, S., A. GONZÁLEZ-CHRISTEN, AND R. LÓPEZ-WILCHIS. 2003. Síntesis del conocimiento de los mamíferos silvestres del Estado de Veracruz, México. *Revista de la Sociedad Mexicana de Historia Natural* 3ª Epoca. 1:91–124.
- GBIF 2007. GBIF data portal. Available from: <http://www.gbif.org> [accessed 21 May 2007].
- GODÍNEZ, H. 2005. *Onychomys arenicola* Mearns, 1896. Pages 704–705 in G. Ceballos and G. Oliva, editors, *Los mamíferos silvestres de México*. CONABIO-Fondo de Cultura Económica.
- GONZÁLEZ-CHRISTEN, A., S. GAONA, AND G. LÓPEZ-ORTEGA. 2002. Registros adicionales de mamíferos para el Estado de Veracruz. *Vertebrata Mexicana* 11:9–17.
- GONZÁLEZ-CHRISTEN, A., A. GONZÁLEZ-ROMERO, AND J.S. RODRÍGUEZ-COLMENARES. 2006. Primer registro de *Taxidea taxus berlandieri* Baird, 1858 (Mammalia: Carnivora: Mustelidae) para el Estado de

- Veracruz, México. *Acta Zoológica Mexicana* (n.s.) 22(3):153–156.
- HALL, E.R. 1981. *The mammals of North America*. 2nd edition. Volume 2. John Wiley & Sons, New York.
- HINESLEY, L. 1979. Systematics and distribution of two chromosome forms in the southern grasshopper mouse; genus *Onychomys*. *Journal of Mammalogy* 60:117–128.
- NATURESERVE. 2004. InfoNatura: birds, mammals, and amphibians of Latin America [web application]. Version 4.1. NatureServe, Arlington, VA. Available from: <http://www.natureserve.org/infonatura> [accessed 20 May 2007].
- LÓPEZ-WILCHIS, R., AND J. LÓPEZ-JARDINES. 1998. Los mamíferos de México depositados en colecciones de Estados Unidos y Canadá. Volume 1. Universidad Autónoma Metropolitana Unidad Iztapalapa, México, D. F. 323 pp.
- MUSSER, G., AND M.D. CARLETON. 1993. Family Muridae. Pages 501–755 in D.E. Wilson and D.M. Reeder, editors, *Mammal species of the world: a taxonomic and geographic reference*. 2nd edition. Smithsonian Institution Press, Washington DC.
- \_\_\_\_\_. 2005. Superfamily Muroidea. Pages 894–1531 in D.E. Wilson and D.M. Reeder, editors, *Mammal species of the world: a taxonomic and geographic reference*. 3rd edition. Johns Hopkins University Press, Baltimore, MD.
- RAMÍREZ-PULIDO, J., J. ARROYO-CABRALES, AND A. CASTRO-CAMPILLO. 2005. Estado actual y relación nomenclatural de los mamíferos terrestres de México. *Acta Zoológica Mexicana* (n.s.) 21(1):21–82.
- RAMÍREZ-PULIDO, J., A. CASTRO-CAMPILLO, M.A. ARMELLA, AND A. SALAME-MÉNDEZ. 2000. Bibliografía reciente de los mamíferos de México 1994–2000. Universidad Autónoma Metropolitana, México, D. F. 280 pp.
- RAMÍREZ-PULIDO, J., I. LIRA, S. GAONA, C. MÚDESPACHER, AND A. CASTRO-CAMPILLO. 1989. Manejo y mantenimiento de colecciones mastozoológicas. Universidad Autónoma Metropolitana-Unidad Iztapalapa, México, D. F. 127 pp.
- RIDDLE, B.R., AND R.L. HONEYCUTT. 1990. Historical biogeography in North American arid regions: an approach using mitochondrial-DNA phylogeny in grasshopper mice (genus *Onychomys*). *Evolution* 44:1–15.
- SOTO, M., AND MA. DE JESÚS ANGULO. 1990. Estudio climático de la región del Cofre y Valle de Perote. Instituto de Ecología A.C., Jalapa, México.
- VILLA, R.B., AND F.A. CERVANTES. 2003. Los mamíferos de México. Instituto de Biología, UNAM y Grupo Editorial Iberoamérica. México, D. F. 140 pp.

Received 14 September 2007

Accepted 17 March 2009