

## Helminths of Rodents (Rodentia: Muridae) from Metztitlán, San Cristóbal, and Rancho Santa Elena, Hidalgo, Mexico

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**ABSTRACT:** Forty-two rodents, representing 3 murid species (*Mus musculus*, *Peromyscus maniculatus*, and *Rattus rattus*), were collected from 3 sites: Metztitlán, San Cristóbal, and Rancho Santa Elena in Hidalgo, Mexico, and examined for parasites. In all, 13 species of helminths were collected: 10 nematode taxa (*Syphacia obvelata*, *Syphacia muris*, *Syphacia peromysci*, *Aspicularis* sp., *Gongylonema* sp., *Trichuris muris*, *Trichinella* sp., *Nippostrongylus brasiliensis*, *Capillaria gastrica*, and *Carolinensis carolinensis*) and 3 cestode taxa (*Rodentolepis nana*, *Taenia taeniaeformis*, and *Taenia* sp.). *Nippostrongylus brasiliensis* was most prevalent. *Aspicularis* sp. was the most intense and abundant, followed by *R. nana*. All species collected are new geographic distribution records for Hidalgo.

**KEY WORDS:** *Mus musculus*, *Peromyscus maniculatus*, *Rattus rattus*, helminth, rodent, *Syphacia obvelata*, *Syphacia muris*, *Syphacia peromysci*, *Aspicularis*, *Gongylonema*, *Trichuris muris*, *Trichinella*, *Nippostrongylus brasiliensis*, *Capillaria gastrica*, *Carolinensis carolinensis*, *Rodentolepis nana*, *Taenia taeniaeformis*, Hidalgo, Mexico.

The helminths of the house mouse, *Mus musculus* Linnaeus, 1758, deer mouse, *Peromyscus maniculatus* Wagner, 1845, and the black rat, *Rattus rattus* Linnaeus, 1758, have been studied in various parts of the world for many years (Cameron and Reesal, 1951; Grundmann and Frandsen, 1960; Mafiana et al., 1997). However, the diversity of the helminths parasitizing these rodents in Hidalgo, Mexico, is relatively unknown.

Hidalgo, Mexico, is located at the intersection of the “Eje Neovolcánico” and the “Sierra Madre Oriental” and is characterized by extreme variation in local ecological systems and a high diversity of flora and fauna produced by geographic isolation of local populations. The helminths of fish in the region are relatively diverse and contain Neotropical, Nearctic, and Mexican transition zone components (Salgado-Maldonado et al., 2004). Thus, if the helminths of rodents are consistent with this pattern, a greater diversity of helminths of rodents could be expected in the state than that which is known from the few previous reports (see Falcón-Ordaz and Sanabria-Espinoza, 1995, 1996; Lamothe-Argumedo et al., 1997; Falcón-Ordaz and Sanabria-Espinoza, 1999). To extend our knowledge of the helminths of rodents of Hidalgo to include several previously unsampled ecotypes, 3 localities within the state were sampled: Metztitlán, San Cristóbal, and Rancho Santa Elena.

The first 2 localities are part of the “Reserva de la Biosfera Barranca de Metztitlán,” a nature reserve in a xeric canyon zone of the main tributary of the Río Pánuco. The river is located in hydrologic area 26, with altitudinal gradients ranging from 1,000 to 2,000 m above sea level. The reserve is considered a Pleistocene refuge containing a variety of relictual floral and faunal elements. The third locality, Rancho Santa Elena, is located in the municipality of Tulancingo, in a pine-oak forest south and east of the reserve. Helminthological survey results of rodents from these localities are reported in this study.

### MATERIALS AND METHODS

In all, 42 rodents from 3 sites: Metztitlán (20°36'N; 98°48'W) (3 individuals of *M. musculus*), San Cristóbal (20°33'N; 98°45'W) (18 individuals of *M. musculus* and 4 of *R. rattus*), and Rancho Santa Elena (20°05'N; 98°30'W) (17 individuals of *P. maniculatus*) in Hidalgo, Mexico, were collected between July 2002 and July 2003. Rodents were captured using small Sherman traps with various types of bait. Animals were transported live to the laboratory in the traps and killed by ether overdose. The digestive tract (from lower esophagus to anus), liver, body cavity, and diaphragm muscle were examined for helminths. Rodents were skinned for subdermal examination. Worms were recovered live and fixed according to standard practices (Pritchard and Kruse, 1982). Nematodes were killed in Berland's solution, preserved in 70% alcohol, and cleared with glycerol for study in temporary mounts; when necessary for identification, temporary mounts were made of the synlophe. Cestodes were stained with either Ehrlich's hematoxylin or Semichon's acetocarmine. Some individual helminths were identified only to the generic level because only larval

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