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NORTH AMERICAN RODENTS AS ALTERNATIVE DEFINITIVE HOSTS
FOR *ECHINOCOCCUS MULTILOCULARIS* AND STUDIES ON
THE EXPULSION MECHANISMS OF THE CESTODE

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Since experiments using dogs as definitive hosts of *Echinococcus multilocularis* are costly and biohazardous, the golden hamster, *Mesocricetus auratus*, and Mongolian gerbil, *Meriones unguiculatus*, have been used as alternative definitive hosts. This study is an attempt to find new alternative definitive laboratory hosts for *E. multilocularis* among wild rodents of North America (*Perognathus* spp., *Peromyscus* spp., *Onychomys* sp., *Reithrodontomys* sp. and *Spermophilus* sp.). These wild rodents were orally infected with *E. multilocularis* protoscoleces and the growth of the cestode in their intestines was examined. For comparison, mice, Mongolian gerbils, golden hamsters and Chinese hamsters were also similarly infected. The small intestine was examined histologically to study the cellular response involved in the expulsion of the cestode during the early stage of infection. The effect of prednisolone, which is known to promote the survival of the tapeworms in alternative definitive hosts, was also investigated.

Among the North American wild rodents that were orally inoculated with 5,000–20,000 *E. multilocularis* protoscoleces, *Perognathus* spp. showed the highest potential to serve as alternative definitive host. Of the 5 *Perognathus* spp. that were not treated with prednisolone, 2 were found to harbour adult tapeworms on day 25 postinfection (PI). Worms were not recovered from wild rodents belonging to the other 4 genera after day 2 PI. Tapeworms recovered from *Perognathus* spp. on day 25 PI showed segmentation but were immature when compared with those from prednisolone-treated Mongolian gerbils or golden hamsters recovered on day 21 PI.

Histologically, increases in the number of goblet cells and in the amount of mucus were observed in the small intestines of mice, Mongolian gerbils and hamsters within 24 hours PI. These responses are thought to be related to the rapid expulsion during the early stage of infection. On day 7 PI, many mucosal mast cells (MMC) appeared in the lamina propria of golden hamsters not treated with prednisolone but only a few of these cells were observed in the treated animals. No MMC was observed in either prednisolone treated or untreated Mongolian gerbils.