

GASTROINTESTINAL HELMINTH PARASITES OF THE BLACK RAT (*RATTUS RATTUS*) IN A COAL MINE IN MINAS DO LEÃO, RS, BRAZIL.

HELMINTOS GASTRINTESTINAIS DE RATOS (*RATTUS RATTUS*) DE UMA MINA DE CARVÃO EM MINAS DO LEÃO, RS, BRASIL

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SUMMARY

A parasitological study was carried out to determine the prevalence of intestinal parasites in black rats (*Rattus rattus*) that live in a coal mine and serve as a warning sign for the coal miners. Among 68 rats that were captured and necropsied, 63 (92.7%) were infected. The prevalence rates for *Moniliformis moniliformis*, *Hymenolepis diminuta*, and mixed infection were 76.5% (52), 11.8% (8) and 4.4% (3), respectively.

KEY WORDS: prevalence, intestinal parasites, *Rattus rattus*, *Hymenolepis diminuta*, *Moniliformis moniliformis*

RESUMO

Um estudo parasitológico foi realizado para verificar a prevalência de parasitos intestinais em ratos (*Rattus rattus*) que habitam uma mina de carvão, como animais de alerta para os mineiros. De 68 ratos capturados e necropsiados, 63 (92,7%) estavam parasitados. A prevalência para *Moniliformis moniliformis* foi de 76,5% (52), de 11,8% (8) para *Hymenolepis diminuta* e de 4,4% (3) para a infecção mista.

PALAVRAS-CHAVE: prevalência, parasitos intestinais, *Rattus rattus*, *Hymenolepis diminuta*, *Moniliformis moniliformis*

INTRODUCTION

Rats are geographically distributed over a wide area, but their close proximity to man is undesirable, since they are vectors of parasites that jeopardize public

health (PÊSSOA e MARTINS, 1988) by infecting children (MACHADO e COSTA-CRUZ, 1998; FERREIRA et al., 2003; MARANGI et al., 2003) and adults (SCAGLIONE et al., 1990; MERCADO e ARIAS, 1995). Individuals living in rodent-infested homes are at risk of acquiring intestinal parasites from urban rodents. In coal mines, however, rats serve as a warning sign for miners, being captured by them, taken into the underground galleries, fed and kept alive. According to coal miners, rats will leave the mine immediately if there is imminent danger. The population of urban rats in coal mines is inestimable. Despite the risk of parasitic infection, coal miners work close to rats and even feed them. Krishnasamy et al. (1980) assessed the prevalence of intestinal helminths in *Rattus tiamanicus* and identified eight nematode species, among which 6% corresponded to *H. diminuta*. Roberts (1988) found a 49.3% prevalence of *H. diminuta* in *Rattus exulans*. El Shazly et al. (1994) identified *H. diminuta* and *M. moniliformis* in an experiment with different rodent species. Abdel-Salam et al. (1994) reported an 11.25% prevalence rate for *H. diminuta* in rodents and Yen et al. (1996) found *H. diminuta* and *M. moniliformis* in urban rats in Taiwan. Mafiana et al. (1997) observed a 64.7% prevalence of intestinal helminths in 612 *Rattus rattus*, with a 39.2% rate of infection by *M. moniliformis*. The present study aimed at determining the prevalence of intestinal parasites in rats captured from a coal mine in the town of Minas do Leão, state of Rio Grande do Sul, Brazil.

MATERIAL AND METHODS

Sixty-eight rats identified as *Rattus rattus* (NOWAK, 1999) were captured from a coal mine located in Minas do Leão, Rio Grande do Sul, Brazil.

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The rats were captured in cages and killed by sulfuric ether overdose (Law 6638 as May 8, 1979). The abdominal cavity was opened, the intestine was removed, leaving the intestinal mucosa exposed, and the intestinal content was then scraped and rinsed in distilled water. The parasites were collected, placed on Petri dishes and fixed in AFA. For identification, the parasites were cleared in lactophenol. The specimens were replated onto glass coverslips containing bleach, and were mounted temporarily (UENO e GONÇALVES, 1998), being identified according to Yamaguti (1959, 1963).

RESULTS AND DISCUSSION

The results revealed a 92,7% (63 rats) prevalence of infected rats. Two parasite species were identified: *H. diminuta* and *M. moniliformis*. The prevalence rates for *H. diminuta*, *M. moniliformis*, and mixed infection were 11.8 % (8 rats), 76.5% (52 rats), and 4.4% (3) respectively.

The identification of intestinal helminths in rats is not usual. However, rodents are ubiquitous animals and have a fundamental role in the epidemiology of several diseases, including parasitic zoonoses. Rat tapeworm infection is not very common among humans, but it was reported by Moon (1976) in Korea, by Cohen (1989) in Jamaica, by Hamrick et al. (1990) and SCAGLIONE et al. (1990), respectively in the United States and Italy. *H. diminuta* was found to cause gastrointestinal and nutritional disorders in human beings in Santiago, Chile (1995) and also in Spain (TENA et al. 1998).

Parasitic infections caused by these species are found mainly in children, and often result from uncontrolled and inappropriate sanitation (MACHADO e COSTA-CRUZ, 1998; FERREIRA et al, 2003; MARANGI et al., 2003) We should be warned against the risk of transmission of *H. diminuta* to humans and about the importance of reports on rat tapeworm infection so that control measures can be properly taken. As we found no data on the prevalence of intestinal helminths in coal mine rats, the results will be compared with those obtained from studies on urban and wild rats. The 92.6% prevalence rate observed in our rat population is comparable to that reported by Mafiana et al. (1997) in Nigeria, where *H. diminuta* and *M. moniliformis* presented a 64.7% prevalence rate. Yen et al. (1996) reported a mixed infection rate of 29.6% for *H. diminuta* and *M. moniliformis*, with

a prevalence rate higher than the one obtained in the present study. The explanation to this is that those authors studied urban rats in different habitat conditions. Krishnasamy et al. (1980) showed a 6% prevalence of *H. diminuta* in wild rats in Malaysia. Rodriguez et al. (2000) found *H. diminuta* in wild rats in Costa Rica and Abu-Madi et al. (2001) studied a population of urban rats in Qatar, where only *H. diminuta* (17.6 %) was identified. These authors demonstrated that the prevalence rates of different parasite species that infect rodents vary according to region. The high prevalence of tapeworm infection among coal mine rats, mainly the one caused by *Hymenolepis diminuta*, indicates the risks to which coal miners are exposed, especially at meal time.

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