

Rodent's role in parasitic disease transmission

Shreya Sinha Raja Babu Saw* Anjali Hembram* and Md. Zahid-ul-Haque***

**Assistant Professor, Department of Veterinary Parasitology, CoVs, and AH, BAU, Kanke Ranchi, Jharkhand-834006 *Internee, Department of Veterinary Parasitology, CoVs, and AH, BAU, Kanke Ranchi, Jharkhand-834006

<https://doi.org/10.5281/zenodo.12513373>

Rodents, particularly various species of rats and mice, serve as reservoir hosts for the tapeworm *Hymenolepis*. These tapeworms, such as *Hymenolepis nana* (dwarf tapeworm), can infect humans as well. Infection typically occurs through ingestion of contaminated food or water containing tapeworm eggs shed in the feces of infected rodents. Therefore, rodents play a crucial role in the transmission cycle of *Hymenolepis* tapeworms, serving as reservoirs from which humans can acquire the infection.

Fig 1



Fig 2



Fig 3



Fig 1,2&3 showing *Hymenolepis* spp. in intestine of rodent during P.M

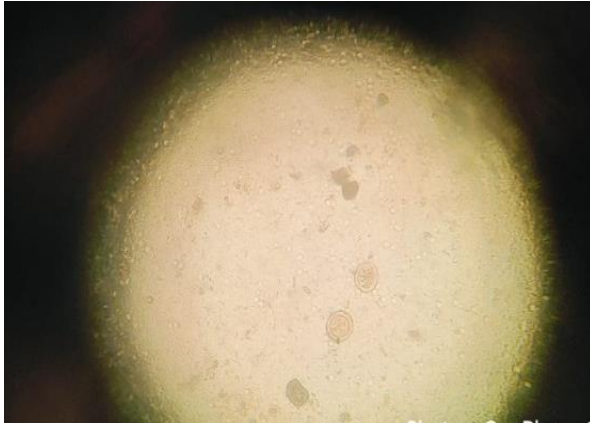


Fig –4 Egg of *Hymenolepis spp* observed at 10X magnification



Fig – 5 Egg of *Hymenolepis spp* observed at 40X magnification

Rodents as transmission of parasitic disease

Rodents are significant in the transmission of various parasitic diseases to humans. Some examples include:

1. **Plague (*Yersinia pestis*):** Rodents, especially rats, serve as reservoirs for the plague bacterium. Fleas that feed on infected rodents can transmit the bacterium to humans, causing plague.
2. **Leptospirosis (*Leptospira spp.*):** Rodents are common carriers of *Leptospira* bacteria. Humans can get infected through contact with water, soil, or food contaminated with rodent urine.
3. **Hantavirus (*Hantavirus spp.*):** Various species of rodents, including deer mice, serve as reservoirs for hanta viruses. Humans can be infected through inhalation of aerosolized virus particles from rodent urine, droppings, or saliva.
4. **Toxoplasmosis (*Toxoplasma gondii*):** Rodents can serve as intermediate hosts for *Toxoplasma gondii*. Cats, which are definitive hosts, can become infected by eating infected rodents. Humans can acquire the parasite through contact with cat feces or consumption of undercooked meat containing tissue cysts.
5. **Lymphatic filariasis (*Wuchereria bancrofti, Brugia spp.*):** Certain species of rodents can serve as reservoirs for filarial worms. Mosquitoes that feed on infected rodents can transmit the parasites to humans, leading to lymphatic filariasis.

Overall, rodents play a crucial role in the transmission of various parasitic diseases to humans either directly through their feces, urine, or saliva, or indirectly through vectors like fleas and mosquitoes. Control measures often involve rodent population management and



improving sanitation to reduce human exposure to these pathogens.

Echinococcosis: Rodents can host larval stages of tapeworms such as *Echinococcus spp.* Humans can become infected by ingesting parasite eggs shed in rodent feces or through direct contact with infected rodents.

Rodents are prolific in urban and rural environments worldwide, increasing the likelihood of human exposure to these parasitic diseases. Prevention measures often include rodent control (e.g., trapping, baiting), improving sanitation practices to reduce rodent access to food and shelter, and personal protective measures such as wearing gloves when handling rodents or cleaning areas contaminated with rodent excreta.

In conclusion, rodents serve as significant reservoirs and vectors for various zoonotic parasitic diseases, posing a considerable public health concern globally. Their close association with human habitats, coupled with their ability to carry and transmit pathogens through feces, urine, saliva, or indirectly via vectors like fleas and mosquitoes, facilitates the spread of diseases such as leptospirosis, hanta virus pulmonary syndrome, plague, toxoplasmosis, lymphatic filariasis, and echinococcosis.

Effective control of these diseases often involves integrated pest management strategies to reduce rodent populations, improve sanitation, and minimize human exposure to contaminated environments. Public health efforts also emphasize education about the risks associated with rodents and the importance of preventive measures, including proper food storage, waste management, and personal hygiene practices. By addressing the role of rodents in disease transmission comprehensively, communities can mitigate the impact of these parasitic diseases on human health.

References

- Khan, W., Nisa, N. And Khan, A., (2017a). Prevalence and risk factors associated with intestinal parasitic infections among food handlers of Swat, Khyber Pakhtunkhwa, Pakistan. *Journal of Food and Nutrition Research*, **vol. 5, no. 5, pp. 331-336.**
- Khan, W. And Khan, A., (2015). Diversity of intestinal parasites in male and female students and workers of Education Department of Swat, Pakistan. *Pakistan Journal of Zoology*, **vol. 47, no. 2, pp. 565-568.**

