

## CASE REPORT

# Occurrence of *Hymenolepis diminuta* (Rudolphi, 1819) in a Wistar White Rat from Guwahati, Assam, India

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*Hymenolepis diminuta* is a common tapeworm of rat which occasionally infect human, monkey and dog (Guardone *et al.*, 2010; Barua *et al.*, 2020) It is found in all temperate zones throughout the world (Andreassen *et al.*, 1999). The adult worm lives in the intestine of the host. The arthropod intermediate host is normally a grain beetle. To date more than 20 different species of arthropods including beetles, fleas, caterpillars, and other insects have been identified as intermediate host for the development of the cysticercoids of this parasite (Andreassen *et al.*, 1999; de Carneri, 2004). Inside the intermediate host, the hexacanth embryo emerge from the egg and develop into a metacystode stage called cysticercoid. Once the arthropod infected with cysticercoids is ingested by the definitive host, *i.e.* rat, dog, monkey or human, it grow into the adult form in the small intestine and its eggs are passed out in the stool of the host (Andreassen *et al.* 1999; de Carneri, 2004

*Hymenolepis diminuta* is known to found in areas where food grains and other dry food products are stored, which are obviously favorite to the rats. Transmission to human is also not uncommon. Therefore, it poses a serious threat to population of rural areas where there is excessive population of rodent. *Hymenolepis* infection is more common in children than in adult (Parija, 2010). Diagnosis is based on demonstration of characteristic ova in fecal sample. There are a few case reports of human infection of *Hymenolepis diminuta* from Orissa, Uttarakhand, Tamilnadu and other parts of India (Watwe and Dardi, 2006; Karuna and Khadanga, 2013; Kalaivani *et al.*, 2014; Tiwari *et al.*, 2014; Gupta *et al.*, 2016). Present article is a report of occurrence of *Hymenolepis diminuta* in a laboratory rat from Guwahati, Assam, India. Diagnosis was done, based on demonstration of characteristic eggs in stool, which were slightly ovoid and brown in colour with relatively thick shell. There were concentric striations in the outer membrane while the inner membrane was thin containing six central hooklets, but no polar filaments. This report is the first to document the presence of this parasite in a well-maintained laboratory in this region, raising concerns about its zoonotic potential.

## CASE HISTORY AND OBSERVATIONS

A laboratory rat (Wistar White rat) of about 1 year age, weighing 200 gm, was presented to the Veterinary Clinical

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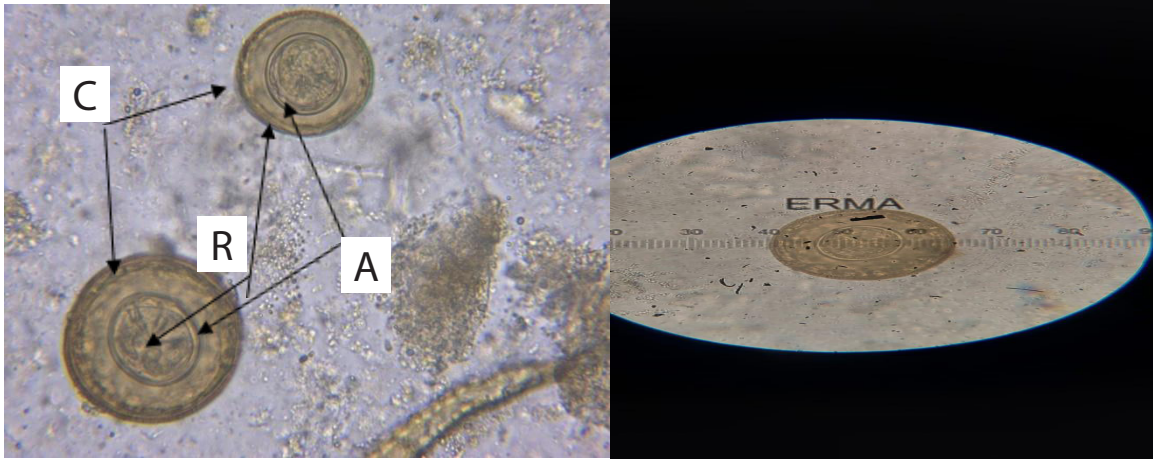
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complex, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati (India), with a complication of diarrhoea, anorexia and depression. The rat was maintained at the laboratory of Department of Pharmacology and Toxicology of the College at Khanapara. There was a history of death of two rats from the same laboratory showing same symptoms in last few days. The stool sample was collected and subjected to coprological examination. The stool examination revealed characteristic ova of *Hymenolepis diminuta*, which were slightly ovoid and brown with relatively thick shell. There were concentric striations in the outer membrane while the inner membrane was thin containing six central hooklets, but no polar filaments (Fig. 1). The absence of polar filament differentiated this species from *Hymenolepis nana*. The dimensions of the ova were 67.3-87.33 mm in length and 63.33-86.67 mm in breadth.

## DISCUSSION

*Hymenolepis diminuta* is a cestode in which human also sometimes act as intermediate host. Human infection results from eating dried fruits or precooked breakfast cereals infested with grain insects which themselves are infected with the cestode by eating rat or mouse droppings. Some symptoms seen in humans include enteritis, anorexia, headache, anal pruritus, abdominal distress and small intestine irritation. Humans are also infected with another



**Fig. 1:** Characteristic ova of *Hymenolepis diminuta*. A. Concentric striation of the outer membrane, B. Central hooklets. C. Absence of polar filament in the inner membrane.

species of *Hymenolepis* worm along with *Hymenolepis diminuta* known as *Hymanolepis nana* or the dwarf tape worm (Andreassen *et al.*, 1999; Janovy, 2000).

There are very few sporadic reports of Hymenolepiasis in human from rural areas of Assam, especially children of low hygienic area (Singh *et al.*, 2020; Soren *et al.*, 2021). But the authors could not track any report of *Hymenolepis diminuta* in rats in public domain from North Eastern Region of India. This case report will be able to through some light on the occurrence of *Hymanolepis diminuta*, the rat tape worm in Assam, which is of zoonotic importance. The occurrence of the tapeworm is thought to be a cause of concern. This present report will surely be able to draw some attention of the expert about the presence of this zoonotic parasite in Assam. It is noteworthy that previous reports of this zoonotic parasite were from low hygienic areas of Assam, but since the present communication recorded the parasite from well-maintained laboratory rat, increased concern for the person working with laboratory rat is warranted along with some awareness campaign. Further systemic study should be conducted to understand the pathogenicity, transmission, and bionomics of the parasite in perspective of Assam.

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