

Larvae of *Taenia taeniaeformis* in the hepatobiliary system of *Mus musculus*

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Citation

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Abstract

This work is the first report of *Mus musculus* as an intermediate host of *Strobilocercus*, larval stage of *Taenia taeniaeformis*, in urban areas of Kermanshah province, Iran. As endoparasites of rodents play an important role in the zoonotic cycles of many diseases and recently *T. taeniaeformis* is considered as zoonotic with medical importance, therefore its diagnosis, treatment and prevention are inevitable tasks.

INTRODUCTION

Taenia taeniaeformis (syn. *Hydatigera taeniaeformis*) (Cestoda: Taeniidae) is distributed worldwide. The final hosts are carnivores of the families Felidae, Canidae and Mustelidae, including domestic cats and dogs [1]. A strobilocercus is a cestode larva produced by *T. taeniaeformis* [2]. *Strobilocercus* usually develop in hepatobiliary system of a rodent intermediate host, but may occasionally develop in the stomach and intestine of usual intermediate hosts such as rat [3-4]. Adult cestodes in the intestine of dogs and cats rarely cause serious disease, and clinical signs, if present, may depend on the degree of infection, age, condition, and breed of host. Clinical signs vary from unthriftiness, malaise, irritability, capricious appetite, and shaggy coat to colic and mild diarrhea; rarely, intussusceptions of the intestine, emaciated, and seizures are seen [5]. In general, the intermediate host shows many more signs of illness than the definitive host.

Diagnosis is based on finding proglottids or eggs in the feces. Cats with access to infected house (or outdoor) mice and rats and suburban, rural, and hunting dogs also can acquire *T. taeniaeformis*. Control of *T. taeniaeformis* of dogs and cats requires therapy and prevention.

CLINICAL FINDINGS

History: After dissecting mice in the Physiology laboratory of College of Veterinary Medicine, University of Razi, for educating of students, we found 4 out of 14 of mice were affected to some kind of tumors in parenchyma of liver and also gall bladder. These mice were lived in Animal house of

College of Science, University of Razi and were bought from Pasteur institute, Tehran, Iran just three months ago. The workers of animal house have reported the free access of wandering cats to their animal's food stock.

Necropsy: Affected mice were underweighted, dull, emaciated, and reluctant to move and touch, dirty coated. Their mucosal membranes were pale and among abdominal organ, only their spleens were much smaller than their healthy counterparts. In 3 out of 4 infected mice verminous tumors were both in livers and gallbladders but in one the worm were lodged just in gall bladder (Figure 1). We found live, long, vermiform and white colored organisms preserved in normal saline, were referred to the Parasitology laboratory, college of Veterinary Medicine, University of Razi, for diagnosis.

Figure 1

Fig.1. and hepatic cyst-laden .



Parasitology: The cyst contained approximately 4.5 x 0.5 cm long larvae without any fluid. The wall was thin but fibrotic. Individual strobilocerca were opaque white and lodged in close curvilinear arrangements (Figure. 1). Their identity is revealed upon opening the cysts, when they burst out. Squash preparations of strobilocerca, were cleared in lactophenol for examination under a light microscope, revealed that they were still immature and the scolex of strobilocerci is not invaginated and is attached to the bladder by a long segmented strobilus (Figures. 2 and 3).

Figure 2

Fig. 2. Whole length of the body of .



Figure 3

Fig. 3. Anterior end of



DISCUSSION

Mice serve as intermediate hosts for the cat tapeworm *Taenia taeniaeformis*. The cysticercoid cyst (*Cysticercus fasciolaris*: strobilocercus) embeds in the liver and the pathogenicity of strobilocercus in mice has been long debated. Infection occurs when mice ingest ova from food or bedding contaminated with cat feces. No treatment is necessary, but feline fecal contamination should be prevented. *T. taeniaeformis* is relatively nonpathogenic in definitive hosts (cats and dogs) but heavy infections can result in mild unthriftiness and gastrointestinal disturbances.

At present several species of surface dwelling rodents and lagomorphs have been indicated as intermediate hosts of the larval forms (strobilocercus) of *T. taeniaeformis*: *Rattus norvegicus*, *R. rattus*, *Arvicola sapidus*, *A. terrestris*, *Microtus agrestis*, *M. nivalis*, *Mus musculus*, *Apodemus sylvaticus*, *A. flavicollis*, *Pitymys mariae*, *P. duodecimcostatus*, *P. savii*, *Clethrionomys glareolus*, *Sigmodon hispidus*, *Ctenomys talarum* and *Lepus americanus* [2, 6-8].

This work is the first report of *Mus musculus* as a natural intermediate host of *T. taeniaeformis* in urban areas of Kermanshah province, Iran. We have recovered strobilocercus larvae from hepatobiliary system of *Mus musculus*. This species has been incriminated as zoonotic with medical importance [9]. It was observed during the study that there has been an increase of human activities in

the Kermansh province of Iran. Dogs and cats were also seen in this area, it's likely that these animals may pick up zoonotic parasites from wild surface dwelling or subterranean rodents and introduce it to humans and laboratory animals in the nearby regions. More studies should be conducted to evaluate the risk of zoonotic disease transmission to humans in this locality in view of the increased human encroachment into this region.

In conclusion, further studies involving other populations and species of Felidae, Canidae and Mustelidae; are necessary to determine if these species serve as reservoirs of *T. taeniaeformis* within its distributional range throughout Iran.

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