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☐ **Brief Communication** ☐

Helminths in *Rattus norvegicus* captured in Chunchon, Korea

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Abstract: We report helminthic infections in the liver and intestine of *Rattus norvegicus* captured in Chunchon, Korea from April to October, 1994. Out of 43 examined rats, eggs of *Capillaria hepatica* were found in 11, *Hymenolepis diminuta* in 14 and *Taenia taeniaeformis* metacestodes in 28. Those rats can be sources of zoonotic infections in the surveyed area.

Key words: rat, *Rattus norvegicus*, *Capillaria hepatica*, *Hymenolepis diminuta*, *Taenia taeniaeformis* metacestode

It is important to survey the parasites of rats for understanding of the source of the zoonotic infections, because rats can be natural reservoir of the serious zoonotic parasitic infections. Some studies on natural parasitic infections in rats in Korea had been carried out. Recently, however, in Korea there were few reports for natural infection of helminths in rats. Furthermore, the first human case of hepatic capillariasis, one of the fatal zoonotic infection was reported in Korea (Choe *et al.*, 1993). Therefore, the significance of zoonotic infections from rats is much stressed nowadays.

Total 43 rats were captured by artificial metal traps or protected hand gloves in the Animal Farm in Chunchon, Korea from April to October, 1994. The rat species was identified through the measurements of length of head, body and tail by the methods of Jones and Johnson (1965). Under anesthesia, all rats were autopsied for gross and histopathological findings in the laboratory. The liver, small and large intestines were examined. For histopathological findings, the liver tissues were fixed in 10% neutral buffered formalin and processed according to the routine histological methods after paraffin embedding. The sectioned tissues were stained with hematoxylin and eosin and examined under light microscope.

All of 43 rats collected were identified as *Rattus norvegicus* of which the coat color of dorsal part was dark brown and ventral part is white. The eggs of *Capillaria hepatica* in granuloma were found in 11 of total 43 rat livers (Table 1). The livers were found as irregular yellowish white appearance on the surface in the liver of wild rats. Massive depositions of eggs were shown in the liver tissue. *Hymenolepis diminuta* were collected from 14 of total 43 rat intestines (Table 1). The *Taenia taeniaeformis* metacestodes were found from 28 of 43 rat livers (Table 1). There was only one rat infected with 3 kinds of helminths (Table 1).

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Table 1. Prevalance of infection by 3 species of parasitic helminths in *Rattus norvegicus* captured in Chunchon, Korea

Parasites	No. of infected rats		
	male (n = 23)	female (n = 20)	total (%) (n = 43)
Capillaria hepatica only	3	2	5(11.6)
Hymenolepis diminuta only	5	2	7(16.3)
Taenia taeniaeformis metacestode only	10	12	22(51.2)
C. hepatica + *H. diminuta*	2	1	3(7.0)
C. hepatica + *T. taeniaeformis* metacesotde	1	1	2(4.7)
H. diminuta + *T. taeniaeformis* metacesotde	1	2	3(7.0)
C. hepatica + *H. diminuta* + *T. taeniaeformis* metacestode	1	0	1(2.3)

C. hepatica is known to be found in the liver of many kinds of mammals, especially in rats. In humans, however, the infection is very rare in spite of the high prevalence of this parasite in rats. Human can be infected by ingesting water or foods contaminated with embryonated eggs or larvae of *C. hepatica*. Some studies on this parasite from *R. norvegicus* were reported in Korea. Nakamura and Kobayashi (1935) described 36.0% infections rate out of 1,251 in Seoul. Seo *et al.* (1964) found out 286 (88.0%) out of 325 in Seoul. Seo *et al.* (1968) reported 12.1% infection rate out of 33 in Pochon, Chorwon, Paju, Kumhwa and Chongpyong. Min (1979) reported 38.1% infection rate from 1,000 in Seoul. The 25.9% of infection rate in this study is expectable according to previous studies.

H. diminuta is well known as common parasites of rat all over the world. The rat is known as a normal host of this parasites. Especially this parasites can be found in various species rodents such as *R. norvegicus*, *R. alexandrinus* and *Apodemus agrarius*. In Korea, *H. diminuta* was found 16.0% out of 325 (Seo *et al.*, 1964) and 6.1% out of 33 *R. norvegicus* (Seo *et al.*, 1968). National survey for intestinal parasite in Korea showed that there was only one out of 46,912 examinee expelled the eggs of *H. diminuta* (Minstry of Health and Social Affairs, 1993).

T. taeniaeformis is also one of the worldwide parasites in the rodents. In Korea, Its metacestode was found 41.3% out of 1,251 (Nakamura and Kobayashi, 1935), 20.0% out of 325 (Seo *et al.*, 1964), and 15. 2% out of 33 *R. norvegicus* (Seo *et al.*, 1968). The infection rate of its metacestde in this study was 65.1%. Life cycle of *T. taeniaeformis* is believed to be well maintained in Korea according to the infection rate 24.4% in cats (Huh *et al.*, 1993).

In this study, the sample size is too small to understand the full aspects of natural zoonotic parasitic infection in the house rats. We could not get the information on the intestinal nematodes, since we did not examine the feces in the large intestine of subjected rats. Although we could not find them grossly, the possibility of existence of them could not be ruled out. Further studies are required from another species of rats and in another areas of Korea.

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=초록=

춘천에서 잡은 시궁쥐(*Rattus norvegicus*)의 윤충 감염

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1994년 4월 부터 10월까지 춘천시내 한 동물농장에서 시궁쥐를 잡아 간과 장에서 윤충의 감염상태를 조사하였다. 모두 43마리 가운데서 간모세선충 11예, 축소조충 14예, 고양이조충의 조충애벌레(metacestode)가 28예에서 발견되었다. 이 시궁쥐들은 조사 지역의 인수공통감염증의 원천이 될 수 있다.

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