

A Nematode, *Orientostrongylus ezoensis*, from Brown Rats in Sakai, Osaka Prefecture

Masaharu YOKOTA, Mamoru HASHIMOTO¹⁾, Tsutomu MATSUI¹⁾, Nobuaki OKU¹⁾, Michiko KIDA¹⁾, Keizou ISHIKAWA²⁾, Hajime MIYAGAWA³⁾, Takashi OHNAKA, and Kunio NAKAJIMA

Sakai City Institute of Public Health, 3-2-8 Kaino-cho higashi, Sakai 590, ¹⁾Shukuin Public Health Center, Sakai City, 3-1-13 Kaino-cho higashi, Sakai 590, ²⁾Otori Public Health Center, Sakai City, 3-220 Otori minami-machi, Sakai 593, and ³⁾Kanaoka Public Health Center, Sakai City, 4-1-5 Shinkanaoka-cho, Sakai 591, Japan

(Received 29 May 1990/Accepted 11 October 1990)

J. Vet. Med. Sci. 53(1): 159-160, 1991

KEY WORDS: brown rat, nematode, *Orientostrongylus ezoensis*.

In recent years a sewer system has been increasingly extended in Sakai City, Osaka prefecture. Brown rats, *Rattus norvegicus*, have few natural enemies and inhabit a sewer system from choice. From the public health point of view they are of great importance, so we have researched into the distribution and parasites of brown rats in October, 1978 and March, 1988.

In 1978 and 1988, 5 and 13 brown rats respectively, consisting of 7 males and 11 females, were captured at manholes in the urban area of Sakai city. *Orientostrongylus ezoensis* Tada, 1975 [7] was detected in the small intestine, especially the jejunum, of 16 out of the 18 brown rats examined and its number ranged from 3 to 1,334. *O. ezoensis* was also reported from brown rats, *Rattus norvegicus*, collected in Sapporo, Kobe, Miki, Tokyo, etc. [2, 3, 9-11].

The specimens were preserved in 10% formalin and were cleared in lacto-phenol solution for microscopic examination. The measurements of these specimens are shown in Table 1. *O. ezoensis* specimens fixed in 10% formalin were filiform and coiled irregularly two or several times. In the intestine fixed with 10% formalin, the worms were found involved in mucus or buried slightly in the mucous membrane. The female 2.38 to 4.16 mm in length with a maximum width of 0.055 to 0.091 mm. The male smaller than the female, being 1.86 to 3.07 mm in length

with a maximum width of 0.050 to 0.079 mm. The externo-dorsal rays of bursa arise from the common trunk at some distance from its base. Spicules short and subequal, 0.070 to 0.084 mm in length (Table 1 and Fig. 1). The number of longitudinal cuticular ridges in mid-body was 23 in male and 24 to 25 in female.

Other nematodes found in the brown rats were *Nippo-*

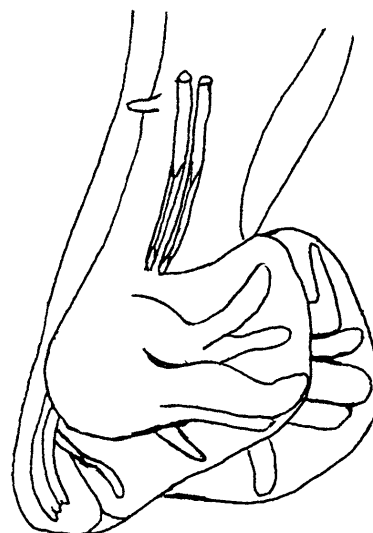


Fig. 1. *O. ezoensis*, male
Bursa, lateral view.

Table 1. Measurements (mm) of adult *Orientostrongylus ezoensis* Tada, 1975 from brown rats

	Male ^{a)}	Female ^{b)}
Body length	1.86-3.07 (2.26)	2.38-4.16 (3.10)
Body width (maximum)	0.050-0.079(0.068)	0.055-0.091(0.069)
Cephalic vesicle		
length	0.038-0.053(0.046)	0.041-0.058(0.048)
diameter	0.024-0.043(0.031)	0.029-0.048(0.036)
Excretory pore to anterior end	0.125-0.204(0.163)	0.139-0.204(0.176)
Length of esophagus	0.284-0.392(0.317)	0.250-0.382(0.324)
Length of spicule	0.070-0.084(0.077)	
Vulva to anus		0.086-0.146(0.117)
Anus to posterior end		0.043-0.058(0.052)

Remarks. In parentheses is shown the average.

a) 26 specimens.

b) 23 specimens.

Table 2. Incidence rates of nematodes in 18 brown rats from Sakai City

Species of nematode	Number of male rats positive	Number of female rats positive
<i>O. ezoensis</i>	6 (86)	10 (91)
<i>N. brasiliensis</i>	7(100)	11(100)
<i>H. spumosa</i>	2 (29)	4 (36)
<i>T. crassicauda</i>	4 (57)	4 (36)
<i>C. hepatica</i>	5 (71)	6 (55)

Remarks. 18 brown rats consist of 7 males and 11 females. In parentheses is shown the percentage.

strongylus brasiliensis, *Capillaria hepatica*, *Trichosomoides crassicauda* and *Heterakis spumosa* (Table 2). These 4 nematode species are of common occurrence in brown rats of Japan and other parts of the world [1, 5–12]. Coccidian oocysts were found in the feces of 5 brown rats. No cestode and trematode were detected.

Of these parasites from brown rats, *Capillaria hepatica* is known occasionally parasitic in man [4, 13]. *C. hepatica* was found from 11 brown rats (61%) in this research. It is noteworthy that the parasite infective to man was detected from brown rats in the urban area. Therefore, it appeared to us that a continuous research on helminths of local rats is necessary to be made for public health.

REFERENCES

1. Flynn, R. J. 1973. p. 219. *In: Parasites of Laboratory Animals*, Iowa State University Press, Ames.
2. Fukumoto, S. 1979. *Jpn. J. Parasitol.* 28: 465–471.
3. Fukumoto, S. and Ohbayashi, M. 1985. *Jpn. J. Vet. Res.* 33: 27–43.
4. Ewing, G. M. and Tilden, I. L. 1956. *J. Pediatr.* 48: 341–348.
5. Kunwar, S. S. 1962. *Ind. J. Helminthol.* 14: 98–111.
6. Sasa, M., Tanaka, H., Fukui, M., and Takada, A. 1962. pp. 195–214. *In: The Problems of Laboratory Animal Disease* (Harris, R. J. C. ed.), Academic Press, New York.
7. Skrjabin, K. I. 1961. pp. 505–509. *In: Key to Parasitic Nematodes*, vol. 3. Strongylata, Israel Program for Scientific Translations, Jerusalem (translated from Russian).
8. Tada, Y. 1975. *Jpn. J. Vet. Res.* 23: 41–44.
9. Uchida, A., Arakawa, O., Murata, Y., and Udagawa, T. 1983. *Jpn. J. Parasitol.* 33: 317–321 (in Japanese with English summary).
10. Uga, S., Matsumura, T., and Emoto, M. 1981. *Jpn. J. Parasitol.* 30: 387–390 (in Japanese with English summary).
11. Uga, S., Takahashi, J., Matuyama, T., and Fujiwara, S. 1982. *Jpn. J. Public Health* 29: 419–423 (in Japanese with English summary).
12. Uga, S., Matsumura, T., Araki, K., Gondo, M., Murata, K., and Kagei, N. 1983. *Jpn. J. Parasitol.* 32: 597–600 (in Japanese with English summary).
13. Yoshida, Y. 1978. p. 122. *In: Illustrated Human Parasitology*, Nanzando Co., Ltd., Tokyo.