

## Intestinal parasites of cats purchased in Seoul

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**Abstract:** Fecal samples of cats purchased in Seoul were examined for helminth ova or protozoan oöcysts from December 1987 to March 1988. Out of the 41 samples, 31 (75.6%) were positive and 60 (146.3%) were cumulative positive for parasites. The followings were identified in the samples: Eggs of *Toxocara cati*, *Clonorchis sinensis*, *Metagonimus* sp., *Pharyngostomum cordatum*, *Spirometra erinacei*, *Taenia taeniaeformis* and oöcysts of *Isospora* sp. From nine autopsied cats, larvae of *Anisakis simplex*, adults of *C. sinensis*, *M. yokogawai*, *P. cordatum*, *S. erinacei* and *T. taeniaeformis* were identified. This is the first report on the detection of *Anisakis* larvae from cats in Korea. The possible role of cats as a source of human infection with each parasite was discussed.

**Key words:** Cat, intestinal parasite, *Anisakis simplex*, *Toxocara cati*, *Clonorchis sinensis*, *Metagonimus yokogawai*, *Spirometra erinacei*, *Taenia taeniaeformis*, *Isospora* sp.

There have been some papers dealing with the intestinal parasites of cats in Korea. Kang (1967) reported parasitic helminths from 41 cats in Kyongsangnam-do with infection rates: *Clonorchis sinensis* (7.3%), *Paragonimus* sp. (4.9%), *Taenia taeniaeformis* (85.4%), *Spirometra* sp. (63.4%) and *Toxocara cati* (21.2%). Lee (1979) described infections of *C. sinensis*, *Heterophyes nocens*, *Centrocestus* spp., *Echinochasmus perfoliatus* and *Echinoparyphium* sp. from 65 cats in Kyongsangbuk-do. Min (1981) also stated the nation-wide survey results of stool examination of 416 cats: *T. cati* (7.7%), *Ancylostoma tubaeformae* (3.1%), *C. sinensis* (1.9%), *P. westermani* (1.4%), *Metagonimus yokogawai* (1.2%) and *Spirometra* sp. (0.7%). Cho and Lee (1981) recorded *Pharyngostomum cordatum* infection from cats purchased in Seoul. There was a paper describing three heterophyid trematodes from

the naturally infected cats: *Heterophyopsis continua*, *Pygidiopsis summa* and *H. nocens* (Eom *et al.*, 1985). As for protozoan parasites, Jang (1975) reported 12.8% of *Isospora* sp. and 4% of *Giardia canis* infections from 86 cats in Chonju and Iri.

We purchased 41 stray cats weighing 2-3 kg each in the Chung-Ang Market, Seoul, Korea from December 1987 to March 1988. Their fecal specimens were examined once by formalin-ether concentration method. We found various kinds of helminth ova and protozoan oöcysts from the feces (Table 1). Eggs of *T. cati* (17/41) and *S. erinacei* (17/41) were most commonly seen. Next was *T. taeniaeformis* (10/41). Eggs of trematodes such as *C. sinensis* (5/41), *Metagonimus* sp. (4/41), and *P. cordatum* (3/41) were also seen. The oöcyst was about 40  $\mu$ m  $\times$  30  $\mu$ m in size, which could be identified only as *Isospora* sp. Autopsy of nine cats revealed more parasites as in Table 2. We could find 14 larvae of *Anisakis simplex* (Chai *et al.*, 1986) in the

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**Table 1.** Results of stool examination of wild cats purchased in Chung-Ang Market, Seoul, Korea

Number of cats examined	41
Number of cumulative positive (%)	60 (146.3)
Number of positive (5)	31 (75.6)
Helminth ova	
<i>Toxocara cati</i>	17 (41.5)
<i>Clonorchis sinensis</i>	5 (12.2)
<i>Metagonimus</i> spp.	4 (9.8)
<i>Pharyngostomum cordatum</i>	3 (7.3)
<i>Spirometra erinacei</i>	17 (41.5)
<i>Taenia taeniaeformis</i>	10 (24.4)
Protozoan oöcyst	
<i>Isospora</i> spp.	4 (9.8)

**Table 2.** Recovered worms from nine autopsied cats

Worm	No. of positive cats (No. of worm)
<i>Toxocara cati</i>	6 (1-20)
Larvae of <i>Anisakis simplex</i>	1 (14)
<i>Metagonimus yokogawai</i>	1 (4)
<i>Clonorchis sinensis</i>	2 (4-36)
<i>Pharyngostomum cordatum</i>	1 (over 1,000)
<i>Spirometra erinacei</i>	5 (1-35)
<i>Taenia taeniaeformis</i>	2 (4-6)

stomach of one cat. This is the first report of cat anisakiasis in Korea. Recovered *Metagonimus* sp. was identified as *M. yokogawai* according to Chai *et al.* (1993), and thousands of *P. cordatum* were found from one cat. The infection with multiple *S. erinacei* was found from 5 cats. Maximum number of the worms was 35.

*T. cati*, *C. sinensis*, *M. yokogawai* and *S. erinacei* are good examples of common zoonotic parasites. Although there has been no human case report yet in Korea, possible occurrence of visceral larva migrans by *T. cati* should be considered in differential diagnosis because of its high infection rate in cats. Cats are the most important final host of *S. erinacei* whose plerocercoid larva infection, sparganosis, can cause a very important, sometimes serious, disease to humans. The snake has been known as the second intermediate host of fibricoliasis and *P. cordatum* infection (Chai *et al.*, 1990)

and the paratenic host of the sparganum in Korea. The present parasitism finding of cats suggested that our cats had a chance to eat flesh of frogs or snakes in the field.

Recent trend of parasitic infections in Koreans is characterized by both the remarkable decrease of the soil-transmitted nematodiasis and the moderate endemicity of the snail-transmitted trematodiasis such as clonorchiasis (Ministry of Health and Social Affairs and Korea Association of Health, 1993). It was worthwhile to note that cats can serve as a reservoir for those trematode infections. Nowadays, the importance of zoonotic parasites is increasing. A human case with a hepatic capillariasis was recently reported in Korea (Choe *et al.*, 1993).

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=국문초록=

### 서울 중앙시장에서 구입한 고양이의 장내 기생충 감염 상황

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서울 중앙시장에서 1987년 12월 부터 1988년 3월까지 구입한 무게 2-3 kg의 고양이의 장내 기생충 감염 상황을 조사하였다. 포르말린-에테르 집란법을 이용한 41마리의 대변검사에서 충란이나 포낭 누적양성수 60, 양성수 31이었다. 고양이회충, 간흡충, 메타고니무스, 고양이주걱흡충(*Pharyngostomum cordatum*), 단손열두조충(*Spirometra erinacei*), 고양이조충(*Taenia taeniaeformis*)의 충란과, *Isospora* spp. (4)의 oöcyst를 발견하였다. 부검한 9마리의 고양이 중 한 마리에서 고래회충(*Anisakis simplex*) 유충이 발견되어 우리 나라에서 첫 고양이 고래회충 유충에 의한 감염의 기록이다. 메타고니무스는 총체수집 후 요꼬가와흡충으로 동정하였다. 이 고양이들은 인수공통감염종의 보유숙주로서 역학적인 중요성이 높다고 하겠다.

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