

Infection status with trematode metacercariae in pond smelts, *Hypomesus olidus*

Hae-Seon NAM^{1)*} and Woon-Mok SOHN²⁾

Department of Parasitology¹⁾, College of Medicine, Soonchunhyang University, Chunan 330-090, and Department of Parasitology²⁾, College of Medicine, Gyeongsang National University, Chinju 660-280, Korea

Abstract: Many Koreans usually eat raw pond smelts, *Hypomesus olidus*, in the winter. This study was performed to evaluate the infection status with trematode metacercariae in pond smelts from January 1998 through February 1999. Among 1,305 fish collected, 459 were purchased from wholesale dealers in Chinchon-gun, Chungchongbuk-do, and the rest of them were caught with a casting net in Soyangho (Lake), Taehoman (Bay) and Paekkokchosuchi (Pond). Seven species of trematode metacercariae including two unidentified ones were detected from 1,305 pond smelts. The number of detected trematode metacercariae according to the species are as follow: *Clonorchis sinensis* 8, *Holostephanus nipponicus* 7, *Cyathocotyle orientalis* 24, *Diplostomum* sp. 14, and *Metorchis orientalis* 7. From the above results, it was confirmed that *H. olidus* plays a role as the second intermediate host of some kinds of trematode including *C. sinensis* in Korea. Our report shows possible clonorchiasis caused by eating raw pond smelts.

Key words: *Hypomesus olidus*, *Clonorchis sinensis*, *Holostephanus nipponicus*, *Cyathocotyle orientalis*, *Diplostomum* sp., *Metorchis orientalis*

Recently, pond smelts, *Hypomesus olidus*, have become one of the most popular freshwater fish eaten in raw, especially during the winter in Korea. Pond smelts are believed to have no parasites because they live in clean and cold water. However, in Japan, they have been reported as the second intermediate hosts of *Clonorchis sinensis* and *Exorchis oviformis* (Morishita et al., 1965). There have been no known reported cases of trematode infection caused by pond smelts in Korea. Therefore, the present study was aimed to investigate the infection status of trematode metacercariae in pond smelts in Korea.

Fish collections and examinations were

• Received 18 October 1999, accepted after revision 24 February 2000.

• This study was supported by a grant from Soonchunhyang University research fund (1998).

*Corresponding author (e-mail: parasit@asan.sch.ac.kr)

carried out ten times from January 1998 through February 1999. Among 1,305 *H. olidus* collected, 459 were purchased from wholesale dealers in Chinchon-gun, Chungchongbuk-do, and the rest of them were caught with a casting net in Soyangho (Lake), Taehoman (Bay), and Paekkokchosuchi (Pond) (Fig. 1). All of the pond smelts were cleanly washed with tap water, ground into small pieces, and digested with pepsin-HCl solution in a 36°C incubator. Digested samples were washed with 0.85% saline and examined under a stereo-microscope to collect trematode metacercariae.

Seven species of trematode metacercariae, including two unidentified ones were detected from 1,305 pond smelts. The number of detected metacercariae according to the species are as follow: *C. sinensis* 8, *Holostephanus nipponicus* 7, *Cyathocotyle orientalis* 24, *Diplostomum* sp. 14, and



Fig. 1. The pond smelts, *Hypomesus olidus*.

Metorchis orientalis 7 (Table 1).

The prevalence of helminthiasis has remarkably decreased in Korea. Especially, infection by soil-transmitted helminths such as *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworms is no longer a threat to public health. However, clonorchiasis is still highly prevalent in many endemic areas and is regarded as the most important parasitic disease in Korea (Ministry of Health and Welfare and Korea Association of Health, 1997).

Until now, many types of freshwater fishes have been reported as the second intermediate hosts of *C. sinensis* in Korea (Kim et al., 1979; Kang et al., 1985; Rim, 1986; Joo, 1988; Sohn

and Choi, 1997). However, the role of *H. olidus* as a intermediate host for parasites has not been reported yet in Korea. In the present study, it was confirmed that the pond smelt indeed plays a role as the second intermediate host for certain types of trematode including *C. sinensis*. Thus, it is recommended to avoid eating raw pond smelts to prevent possible clonorchiasis.

REFERENCES

- Joo CY (1988) Changing patterns of infection with digenetic larval trematodes from fresh-water fish in river Taewha, Kyongnam province. *Korean J Parasitol* **26**: 263-274.
- Kang SY, Kim SI, Cho SY (1985) Seasonal variations of metacercarial density of *Clonorchis sinensis* in fish intermediate host, *Pseudorasbora parva*. *Korean J Parasitol* **23**: 87-94.
- Kim YK, Kang SY, Lee SH (1979) Study on the frequency distribution of the metacercarial density of *Clonorchis sinensis* in fish host, *Pseudorasbora parva*. *Korean J Parasitol* **17**: 127-131 (in Korean).
- Ministry of Health and Welfare, Korea Association of Health (1997) Prevalence of intestinal parasitic infections in Korea — The sixth report — (in Korean).
- Morishita K, Komiya Y, Matsubayashi H (1965)

Table 1. The infection status of trematode metacercariae in 1,305 *Hypomesus olidus* examined

| Year | Month & date | No. of fish examined | Source of fish examined | No. of metacercariae detected |
|-------|--------------|----------------------|-------------------------|---|
| 1998 | Jan. 12 | 28 | Wholesale dealer | Cs ^{a)} 2, Hn ^{b)} 5, Co ^{c)} 19 |
| | Feb. 1 | 21 | Paekkokchosuchi | — |
| | Feb. 1 | 131 | Wholesale dealer | Cs 1, Mo ^{d)} 6, Dip.sp. ^{e)} 6 |
| | Mar. 3 | 120 | Wholesale dealer | Hn 2 |
| | Mar. 6 | 180 | Wholesale dealer | Dip.sp. 3 |
| | Dec. 18 | 62 | Taehoman | Cs 3, Mo 1, Co 5 |
| | Dec. 21 | 249 | Soyangho | — |
| 1999 | Jan. 13 | 156 | Soyangho | unidentified sp.I 83 |
| | Feb. 3 | 156 | Soyangho | Cs 2, Dip.sp. 5 unidentified sp.I 55 unidentified sp.II 1 |
| | Feb. 11 | 202 | Soyangho | unidentified sp.I 20 |
| Total | 10 times | 1,305 | | |

^{a)}*Clonorchis sinensis*, ^{b)}*Holostephanus nipponicus*, ^{c)}*Cyathocotyle orientalis*, ^{d)}*Metorchis orientalis*, ^{e)}*Diplostomum* species

- Progress of medical parasitology in Japan
Volume II. pp88-167, Meguro parasitological
museum, Tokyo, Japan.
- Rim HJ (1986) The current pathobiology and
chemotherapy of clonorchiasis. *Korean J
Parasitol* **24**(suppl.): 41-45.
- Sohn WM, Choi YS (1997) Infection status with
trematode metacercariae in the fresh-water
fish from Chunamchosuchi (pond), Uichang-
gun, Kyongsangnam-do, Korea. *Korean J
Parasitol* **35**: 165-170 (in Korean).