The Korean Journal of Parasitology
Vol. 31, No. 2, 165-167, June 1993

☐ **Brief communication** ☐

Activities of acid phosphatase and non-specific esterase are present in the tribocytic organ and the caecum of *Fibricola seoulensis*

Sun Huh

Department of Parasitology, College of Medicine, Hallym University, Chunchon 200-702, Korea

Abstract: In order to know the enzyme activities of *Fibricola seoulensis*, an intestinal trematode of human and rodent in Korea, the enzyme histochemical method is applicated. Activities of acid phosphatase (E.C.3.1.3.2) and non-specific esterase (E.C.3.1.1) were present in microvilli and glandular cells of tribocytic organ and the epithelium of the caecum.

Key words: *Fibricola seoulensis*, tribocytic organ, acid phosphatase, non-specific esterase, histochemistry

For the understanding of the biochemical role of the tribocytic organ of *Fibricola seoulensis*, an intestinal trematode of human and rodent in Korea, it is necessary to find out the histolytic enzymes from the glandular cells or secretes of this organ. Huh *et al.* (1990) reported that there was an activity of the alkaline phosphatase (E.C.3.1.3.1) from the tegument of the tribocytic organ. I tried to know if there was activity of the acid phosphatase (E.C.3.1.3.2) or non-specific esterase (E.C.3.1.1) from the above organ which was believed to do adhesive and digestive functions, using the enzyme histochemical method.

I got the metacercariae of *F. bseoulensis* by incubation of the snake (*Rhabdophis tigrina*) intestine in the 6 w/v % pepsin in 0.25 M HCl solution for 2 hours. I infected the 500 metacercariae each to the BALB/c mice (four-week old) purchased from the Animal Husbandary Center, Hallym University, reared them with the conventional method. I collected the adult worms from the mouse duodenum 14 days post-infection. Fresh worms were frozen and embedded in the O.C.T. compound. They were sectioned in 10 μm thickness on the freezing microtome. I applied the lead nitrate method for acid phosphatase (modifed by Gomori, 1950) and the α-naphthyl acetate method for non-specific esterase (after Gomori, 1952). I incubated the slides with substrate solutions for 30 minutes (for acid phosphatase) or for 3 minutes (for non-specific esterase) (Drury and Wallington, 1980).

The acid phosphatase activities were found from the microvilli and the glandular cells of the tribocytic organ as well as the epithelium of the caecum. The epithelium of the caecum had strongest activity. Microvilli of the rat intestine was also positive (Fig. 1). The non-specific esterase activity was positive not only in the microvilli and the glandular cells of the tribocytic organ but also in the epithelium of the caecum. Microvilli and the epithelium of the rat intestine are also positive (Fig. 2). From the tegument of the organ, I could not see the

• Received Dec. 31 1992, accepted Mar. 31 1993.

• This study is supported by the Korea Research Foundation, Republic of Korea (December 1990-December 1991) and by Hallym University (November 1990-October 1991).

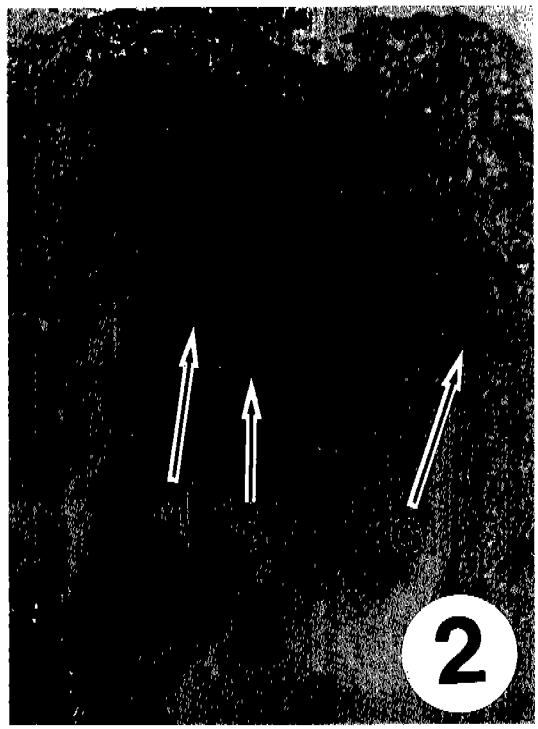

Fig. 1. Rat intestine infected with *F. seoulensis* which shows the acid phosphatase activity from the epithelium of the caecum (C), microvilli (M) and glandular cells (G) of the tribocytic organ. The microvilli of the rat intestine also show the positive. Lead nitrate method, positive- black. × 100.
Fig. 2. Rat intestine infected with *F. seoulensis* which shows the non-specific esterase activity from the epithelium of the caecum (C), microvilli (M) and glandular cells (G) of the tribocytic organ. α-naphthyl acetate method, positive - red. × 100.

activities of both enzymes.

The histochemical studies of the strigeid trematodes were focused on the tribocytic organ because of its secretory role. Phosphatase, esterase and proteolytic enzyme activities were present in the tribocytic organ of strigeid trematodes (Erasmus and Ohman, 1963). I could also found that the tribocytic organ of *F. seoulensis* had the activities of acid phosphatase and non-specific esterase. These organ can fight with the host for the ingestion of the host intestinal villi with such enzymes. From above findings I could infer that not only the tribocytic organ but also the caecum are the sites of the absorption in addition to the tegument. Both enzymes which we wanted to demonstrate are non-specific group of enzymes. For the elucidation of the precise biochemical action, it is necessary to purify the enzymes and to study the enzyme kinetics.

REFERENCES

Drury RAB, Wallington EA (1980) Carleton's histological technique. 5th ed pp298-322 Oxford University Press, Oxford.

Erasmus DA, Ohman C (1963) The structure and function of the adhesive organ in strigeid trematodes. *Ann N Y Acad Sci* **113:** 7-35.

Huh S, Lee SH, Seo BS (1990) Histochemical findings of the tribocytic organ and tegument of *Fibricola seoulensis*. *Korean J Parasit* **28:** 155-160.

=국문초록=

서울주걱흡충 조직융해구와 맹장에 acid phosphatase, non-specific esterase의 활성도가 나타난다

한림대학교 의과대학 기생충학교실

허 선

서울주걱흡충의 냉동절편에서 효소조직화학법을 이용하여 조직융해구(tribocytic organ)와 맹장에 acid phosphatase, non-specific esterase 활성도가 있음을 알 수 있었다. 이 두 기관이 표피 이외에 중요한 흡수기관일 것이다. 이 흡충의 우리말 이름을, 이미 회원들에 의해 제안된 "쥐주걱흡충"은 쥐만 적절한 숙주로 생각할 수 있으므로 발견 장소가 학명에 포함된 것을 감안하여 "서울주걱흡충"이라고 고쳐 쓰고 싶다. 준말로 쓸 때는 "서울흡충"이 나을 것이다.

〔기생충학잡지 31(2):165-167, 1993년 6월〕