Identification of *Stellantchasmus falcatus* Metacercariae Encysted in Mullets in Korea

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**Abstract:** A group of metacercariae encysted in the flesh of *Mugil* sp. were identified to be *Stellantchasmus falcatus* by the morphology of adult worms obtained experimentally. It is confirmed that mullets serve as a second intermediate host of this heterophyid fluke in Korea.

**Key words:** *Stellantchasmus falcatus*, Heterophyidae, intestinal fluke, mullets

*Stellantchasmus falcatus* (Trematoda; Heterophyidae), a small intestinal fluke of fish-eating birds and mammals, is an occasional parasite of humans in Korea (Seo et al., 1984; Hong et al., 1986), Japan (Kagei et al., 1964), Philippines (Africa et al., 1940), Thailand (Tantachamrun and Kliks, 1978) and Hawaii (Alicata and Schattenburg, 1938).

In Hawaii, Japan and China, brackish water snails such as *Stenomelania newcombii* or *Thiara granifera* and brackish water fishes such as mullets (*Mugil* sp., *Liza menada*) and gobies (*Acanthogobius flavimanus*, *Gobius* sp.) were reported to be its first (Noda, 1959) and second (Onji and Nishio, 1924; Alicata and Schattenburg, 1938; Kobayasi, 1968) intermediate hosts respectively. In Korea, however, intermediate hosts of *S. falcatus* were not extensively studied. Seo et al. (1979) discovered *Stellantchasmus* metacercariae from mullets, but the metacercariae were not definitely identified through obtaining adult worms. In the present study, a group of heterophyid metacercariae encysted in the flesh of *Mugil* sp. was identified to be *S. falcatus* by the morphology of adult worms obtained after experimental infection to albino rats.

In May 1986, total 10 *Mugil* sp., 20~30cm long, were purchased from a local fisheries market in a southern part of Kyeongsang-nam-do (Province). They were brought to the laboratory, and artificially digested to examine heterophyid metacercariae, especially *S. falcatus*. The metacercariae which were morphologically characterized by submedially located ventral sucker and elongated seminal vesicle (expulsor) (Fig. 1) were tentatively diagnosed as *S. falcatus*. Three mullets were found infected with *S. falcatus*, from which a total of 470 metacercariae were collected. They were 0.15~0.20 mm by 0.13~0.19 mm in size and round to elliptical in shape (Fig. 1). Most of the metacercariae were found from muscles and a few were from the head and gill.

Among them 280 were used to infect 5 rats (Sprague–Dawley), 30~100 to each rat, and 7~10 days later the rats were sacrificed to harvest worms from their intestinal tract. Total 83 adult worms (29.6% of infected) were harvested.

Morphologically the worms were compatible with *S. falcatus*, both in measurements and descriptions (Onji and Nishio, 1924; Seo et al., 1984). They were 0.41~0.70 mm long and 0.32~0.39 mm wide, and beset with minute scale-like spines (Fig. 2). They were characterized by the presence of ventrogenital sac (Fig.
Fig. 1. Metacercaria of *S. falcatus* collected from a mullet, dorsal view (Scale: 50 μm). Note the elongated seminal vesicle (SV) and round excretory bladder (EB).

Fig. 2. Adult worm of *S. falcatus* recovered from an experimental rat 7 days after infection (Scale: 200 μm).

Fig. 3. Magnification of Fig. 2 near the ventrogenital sac (VS) and seminal vesicle (SV), which consists of a muscular expulsor and a vesicular part (arrows) (Scale: 100 μm).
3) containing ventral sucker armed with minute spines (less than 1μm) on its inner rim, and of seminal vesicle consisted with an elongated muscular expulsor and a round vesicular part (arrows in Fig. 3).

As to the taxonomy of Stelphantchasmus spp., at least 4 species had been reported before Chen(1951), who reduced them to only one species, S. falcatus. The reduction is agreed, or followed, by succeeding authors (Pearson, 1964; Seo et al., 1984). Another species, S. aspinosus, was proposed by Pearson(1964), with the differential morphology of unarmed and little modified ventral sucker in S. aspinosus.

S. falcatus is, like other heterophyid flukes such as Haplorchis spp. and Procerovum calderoni, one of the potent pathogenic agents of extraintestinal (cardiac, cerebral and spinal) heterophyidiasis in man (Africa et al., 1940). Nevertheless, host-parasite relationships in heterophyid infections, especially in terms of pathophysiological and immunological aspects of extraintestinal parasitism, have never been studied in detail. Since human infection with S. falcatus or other heterophyid flukes seems not uncommon in areas where brackish water fishes are eaten raw and cases are expected to increase, studies on host-parasite relationships are greatly needed.

The present study confirmed that the mullet serves as a second intermediate host of S. falcatus in Korea.

REFERENCES


남해산 쓰어(崇魚)에서 검출된 *Stellanchasmus falcatus* 피낭유충의 동정

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경상남도 남해 지방산 쓰어에서 *Stellanchasmus falcatus*의 피낭유충을 발견하고 원위에 감염시킨 후 성충을 얻어 동정하였다. 검사한 쓰어는 모두 10마리로서 크기 20~30cm이었고 그 중 3마리에서 *S. falcatus*로 생각되는 피낭유충이 470개 검출되었다. 피낭유충은 원형 또는 타원형으로 크기 0.15~0.20 × 0.13~0.19mm이었고 대부분이 쓰어의 근육에서 발견되었다.

총 280개의 피낭유충을 원위 5마리에 각각 30~100개씩 나누어 감염시키고 7~10일후에 원위를 회생시켜 소장(小腸) 내용물로 건져낸 후 총 83마리의 성충이 회수되었다. 회수된 충체는 길이 0.41~0.70mm, 폭 0.32~0.39mm이었고, 장낭형(長囊形; elongated sac-like)의 expulsor를 가진 제정낭(seminal vesicle) 등 몇 가지 형태학적 특징을 근거로 *S. falcatus Onji et Nishio, 1915*로 동정되었다.

이 연구로 우리나라에서도 쓰어가 *S. falcatus*의 제2충전수주의성을 하고 있음을 확인되었고 이 종충의 인체 감염원이 되고 있을 것으로 추측되었다.