

Two digenean parasites infestations of sea bass, *Lateolabrax japonicus*(Cuvier), from the Korean southern sea

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Two species of digeneans, *Tergestia laticollis* and *Biovarium cryptocotyle*, were collected from the intestine of sea basses (*Lateolabrax japonicus*) captured at the Korean Southern Sea. *T. laticollis* was characterized by having cephalic lobes around oral sucker, six muscular flanges on each lateral surface at level of pharynx, and species-specific egg size. The most outstanding characteristic of *B. cryptocotyle* was two-divided ovary. These two digenean species were the first recording species in Korea and *L. japonicus* was the newly recording host for *T. laticollis*.

Key words : *Tergestia laticollis*, *Biovarium cryptocotyle*, Digenea, Sea bass

Sea bass, *Lateolabrax japonicus*, is one of the commonly cultured fishes in Korea. In spite of the economic importance, relatively little known about the parasites of sea bass in our country. Since Sim *et al.* (1989) had reported *Dactylogyrus* sp. from cultured sea bass, there have been no report on the parasites of sea bass.

The parasites occurring in natural sea bass are closely related to the parasitic diseases in cultured sea bass. Because many individuals of natural sea bass live around the culturing cages of sea bass, various parasite species can be transmitted between those two groups in both directions.

The objective of this research is to elucidate the parasite fauna of sea bass in Korea and to

analyse the relationships between the parasites of natural sea bass and those of cultured sea bass. To this aim, in the present paper the intestinal digeneans of natural sea bass were examined.

Materials and Methods

Natural sea bass were collected by trawl in Kwangyang Bay, Hadong-Gun between August and October, 1996. Collected sea basses were transported to the our laboratory in live state and examined all organs for parasites.

The recovered digenean worms were fixed in hot 70% alcohol and stained with Semichon's acetocarmine, then mounted with canada balsam.

Mounted specimens were measured and observed with light microscope and were illustrated with the aid of a camera lucida.

Results

The collected number of sea bass in this survey period was 8. Two species of digeneans, *Tergestia laticollis* and *Biovarium cryptocotyle*, were recovered from the intestine and these two species were the first recording species in Korea.

Among eight sea basses, each of two individuals was infected with one *T. laticollis*, and one sea bass was infected with one *B. cryptocotyle*.

Tergestia laticollis(Rudolphi, 1819) Stossich, 1899

Synonym : *Distoma laticolle* Rudolphi, 1819

Tergestia acanthogobii Yamaguti, 1938

Description(Fig. 1). This description is based upon 2 whole-mounted, unpressed mature worms. The dimensions of this worm are given in Table 1.

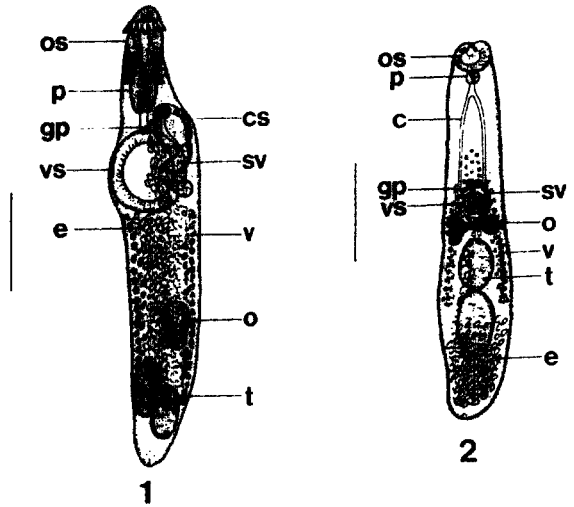


Fig. 1. *Tergestia laticollis*(ventral view) 2. *Biovarium cryptocotyle*(ventral view)

(c : caecum, cs : cirrus sac, e : egg, gp : genital pore, o : ovary, os : oral sucker, p : pharynx, sv : seminal vesicle, t : testis, v : vitellarium, vs : ventral sucker) Bar scale : 0.3 mm

The small, elongate worm bears no spines on the tegument. The almost terminal oral sucker

Table 1. Dimensions of *Tergestia laticollis* from the present material and from the literature(Unit : mm)

Items	Authority		
	Odhner(1911)	Bray & Gibson(1980)	Present material
Hosts	<i>Trachurus trachus</i>	<i>Trachus trachus</i>	<i>Lateolabrax japonicus</i>
Length	up to 4	0.80-4.6	1.38
Breadth	0.2-0.33	0.26-0.76	0.26
Oral sucker	0.16-0.18	0.16-0.21×0.14-0.24	0.18×0.12
Ventral sucker	0.17-0.20×0.20-0.23	0.18-0.37×0.20-0.41	0.25×0.23
Sucker ratio	1 : 1.06-1.1	1 : 1.1-1.75	1 : 1.63
Pharynx	0.08-0.10×0.17-0.25	0.18-0.26×0.07-0.12	0.15×0.08
Testes	-	0.10-0.25×0.095-0.39	0.14×0.09
Ovary	-	0.13-0.23×0.12-0.35	0.14×0.08
Eggs	0.021-0.023×0.015	0.024-0.028×0.014-0.017	0.022-0.023×0.015-0.016

is longitudinally elongated, and surrounded by an interrupting, upside down crown of 13 muscular projections. Each projection is conical in shape, and the bases of each projection are fused into one ring. A small tegumental papilla present under the ring of projections on both sides. The six flange-like structures lie along the body surface on either side of oral sucker and pharynx or only on pharynx. The ventral sucker is globular, locates anterior to midline, and larger than oral sucker in the ratio of about 1 : 1.6. The prepharynx is absent. Two caeca extend back almost to the posterior extremity of body.

Two testes are irregularly elongate oval and lie in obliquely. The cirrus sac is clearly divided into two parts. The proximal part contains an elongate, saccular seminal vesicle, and extends to the posterior end of ventral sucker. The anterior half of seminal vesicle is surrounded by a layer of prostatic gland cells. The distal part of the cirrus sac globular, contains ejaculatory duct. The genital atrium opens just anterior to the ventral

The ovary is, also, elongate oval and lies anteriorly to the testes. The vitellarium consists of irregular follicles in two symmetrical, lateral fields. Anteriorly the fields of vitellarium reach to the posterior margin of ventral sucker, and posteriorly to the posterior margin of posterior testis. The uterus distributes mainly in the post-acetabular region, filling up much of the available space in the hindbody. The uterus contains numerous ope-rculate eggs.

Biovarium cryptocotyle Yamaguti, 1934

Description(Fig. 2). This description is based upon 1 whole-mounted, unpressed mature worm. The dimensions of this worm are given in Table 2.

The body is elongate, flat rod shape with rounded both ends. The worm bears, over its surface, fine spines. The terminal oral sucker is large with no circumoral spines. The pharynx is small and the esophagus is short. Several fragments of eye spots are found around pharynx. The ven-

Table 2. Dimensions of *Biovarium cryptocotyle* from the present material and from the literature(Unit : mm)

Items	Authority	
	Yamaguti(1934)	Present material
Hosts	<i>Lateolabrax japonicus</i>	<i>Lateolabrax japonicus</i>
Length	1.37	1.14
Breadth	0.26	0.23
Oral sucker	0.14×0.15	0.088×0.11
Ventral sucker	0.084×0.095	0.065×0.065
Sucker ratio	1.6 : 1	1.53 : 1
Pharynx	0.053×0.047	0.05×0.04
Testes(anterior)	0.17×0.084	0.145×0.103
(posterior)	0.19×0.095	0.193×0.113
Ovary (right)	0.053×0.074	0.088×0.063
(left)	0.084×0.1	0.068×0.055
Eggs	0.019-0.021×0.01-0.011	0.020×0.010

tral sucker is small, lies anterior to the middle of body. Sucker ratio between oral and ventral sucker is about 1.5 : 1.

The two elongate oval testes is tandem in median line, and contiguous each other. The posterior testis is larger than anterior one. The strongly convoluted seminal vesicle embraces the left side of the ventral sucker. The genital pore opens just above the ventral sucker. The cirrus and pars prostatica are not observed.

The ovary branched into two lobes and each lobe characteristically crenulated. The two lobes of ovary are connected by a slightly thick bridge. The vitellaria distribute between anterior testes and caecal bifurcation. In the preacetabular zone, the vitellaria are united across the median line. The uterus fills up mainly the posterior region of the posterior testis. Eggs are small and numerous.

Discussion

The genus *Tergestia* is a small group belonging to the family Fellodistomidae. This genus is easily distinguished with other digeneans by following characteristics: Cephalic lobes around oral sucker, six muscular flanges on each lateral surface at level of pharynx, intestinal bifurcation in hindbody, distinctly bipartite cirrus-sac.

Tergestia laticollis differ from other congeneric species in sucker ratio and egg size. Bray and Gibson(1980) considered *Tergestia acanthogobii*, which was reported as a new species by Yamaguti (1938), to be a synonym of *T. laticollis*. Examining Yamaguti's description of *T. acanthogobii*, we could not find any characteristics from *T. laticollis*, also. The sucker ratio of *T. laticollis* is seemed very

variable character, although the oral sucker is always smaller than the ventral sucker. In our two specimens, one specimen's sucker ratio is 1 : 1.6, but the other specimen's is 1 : 2. Bray and Gibson(1980) described that the seminal vesicle of *T. laticollis* was entirely surrounded by a layer of prostatic gland-cells, but we observed only anterior half of the seminal vesicle was surrounded by prostatic cells in our specimens. We could not know the reasons of this difference, however, all other features are well coincide with previous descriptions(Odhner, 1911 ; Bray and Gibson, 1980). *Lateolabrax japonicus* is recorded as a new host for *T. laticollis* in the present study.

The genus *Biovarium* belongs to the family Cryptogonimidae. Yamaguti(1934) erected *Biovarium* as a new genus based on the type species, *B. cryptocotyle*. In this genus, only one species, *B. cryptocotyle*, is included and we could not find any reports on this genus except original paper. The most distinguishing characteristic of this species from other cryptogonimids is clearly divided ovary.

According to original description of Yamaguti (1934), *B. cryptocotyle* has a distinct prepharynx. However, we could not observe prepharynx in our specimen. This difference may be a distinguishing feature at species level. Considering the morphological variations according to the fixing method, however, we treated this difference as a result of intraspecific variation or different fixing methods. The prevalences and infestation intensities of these two parasitic species are very low. Therefore, the effects of these parasites to the host is seemed very low, also.

T. laticollis and *B. ovarium* are the first recording species in Korea. More elaborate works are

need to elucidate the parasite species in sea bass, and to know interactions between the parasites of natural sea bass and those of cultured sea bass.

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한국 남해안산 농어에 기생한 흡충류 2종

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한국 남해안에서 채집된 농어의 장에서 흡충류 2종—*Tergestia laticollis*, *Biovarium cryptocotyle*—이 검출되었다. *T. laticollis*는 구흡반의 주위로 거꾸로된 왕관모양의 두엽들과 인두주변에 6쌍의 판자모양 구조물 및 충란의 크기 등에 의해 다른 종들과 구분되어졌으며, *B. cryptocotyle*의 가장 특징적인 점은 난소가 2분지된 점이였다. 이 두 종은 우리나라에서 처음 기록되는 미기록종들이었으며, 농어는 *T. laticollis*의 새로운 종숙주임이 금번 연구를 통해 밝혀졌다.

Key words : *Tergestia laticollis*, *Biovarium cryptocotyle*, Digenea, Sea bass