A New Species of Marine Cercaria *Cercaria itoi* sp. nov. from the Spindle Shell *Fusinus perplexus* from Kanagawa Prefecture, Japan

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A new species of marine cercaria, possibly belonging to the family Acanthocolpidae, was found in the digestive gland of the spindle shell *Fusinus perplexus* and the specific name *Cercaria itoi* is proposed. *C. itoi* is a distome and biocellate cercaria with a long simple tail, five pairs of penetration gland cells, I-shaped excretory vesicle, 66 flame cells on each side and peculiar structures of comma- to sausage-shaped minute bodies, probably cystogenous glands, filled in the hindbody posterior to the acetabulum. The cercaria develops in redia, but its maturation of the cercaria occurs in the digestive gland of the host, after the immature cercariae leave the redia.

**Introduction**

In the course of a series of parasitological surveys on larval trematodes from marine and brackish gastropods and pelecypods, a new species of marine cercaria was found from the spindle shell *Fusinus perplexus*. This gastropod lives at the sandy or muddy flat in the subtidal zone of the Japanese coastal area. Materials for this study were collected at Mito, Mura Peninsula, Kanagawa Prefecture Japan (map reference: 35°10'N, 139°38'E) in June 1983, and 253 shells measuring 6-15 cm (mean: 9.8 cm) in shell height were examined. Morphological and histological observations were made as described previously (SHIMURA and ITO, 1980; SHIMURA, 1983).

The species is named *Cercaria itoi* for Professor Jiro Ito in recognition of his many and conspicuous contribution to parasitology, especially for his studies on cercariae.

**Description of the Species**

*Cercaria itoi* sp. nov.

Presumptive adult form: Acanthocolpidae (?)  
Host: *Fusinus perplexus* (Gastropoda, Fasciolariidae)  
Locality: Mito, Miura Peninsula, Kanagawa Prefecture, Japan

Date and infection rate: June 18, 1983, 2.4% (6/253)  
Measurements: mean (range in parentheses) in microns  
*Cercaria*  
body ............... 762 (714-794) long by 222 (203-247) wide by 130 (116-140) thick,  
oral sucker ........... 65 (58-73) long by 68 (60-73) wide,  
prepharynx ........... 73 (70-75) long,  
pharynx .............. 26 (22-29) long by 24 (19-29) wide,  
eye-spot .............. 22 (15-29) long by 17 (15-19) wide,  
acetabulum ............ 72 (65-75) long by 73 (68-77) wide,  
excretory vesicle ...... 298 (266-324) long by 100 (53-133) wide,  
tail ................. 973 (931-1,009) long by 45 (36-51) wide,  

*Redia*  
body ............... 1,150 (950-1,340) long by 171 (147-196) wide,  
pharynx .............. 52 (41-58) long by 54 (51-60) wide.  

Specimen: MPM Coll. No. 19373 (Meguro Parasitological Museum, Tokyo)
Fig. 1. *Cercaria itoi* sp. nov., a–e: cercaria, a: general feature, ventral view, b: enlarged body structure, c: typical posture of heat-killed cercaria, side view, d: swimming posture, e: resting posture, f: redia with immature cercariae and germ balls.
A New Marine Cercaria from *Fusinus*

Specific description (Figs. 1 and 2)

Distome and biocellate cercaria with large flat body and long simple tail (Fig. 1a, b). The body surface is covered with backward directed spines being more sparse posteriorly than anteriorly. However, the ventral side of the hindbody posterior to the acetabulum is aspinose. Sensory hairs are not observed. The oral sucker is well developed, globular and located at the anterior end of the body. The stylet is absent. The prepharynx is long and the pharynx is globular. The esophagus is very short and bifurcates just posterior to the pharynx into slender ceca which are not discernible. A pair of oval eye-spots are situated at the prepharyngeal level. The transverse nervous commissure is feebly discernible at the level of the eye-spots. The acetabulum is also well developed, almost equal in size to the oral sucker and embedded in fleshy protrusion at the anterior fourth of the body. Its opening is surrounded by numerous inwardly directed spines. Two groups of penetration gland cells are found on each side: three large cells posterolateral to the acetabulum and two small ones close to the median line anterior to the acetabulum. The ducts of the two groups form separate bundles, extend anteriorly through the dorsal side of the oral sucker and open anterior to the mouth. The penetration gland cells and their ducts are unstainable with neutral red. Peculiar structures of comma- to sausage-shaped minute bodies, probably cystogenous glands, are packed beneath cuticle of the dorsal surface in the entire hindbody posterior to the acetabulum except its lateral and posterior fringe. A pair of longitudinal strands (parenchymal or muscle fibers?) run along the lateral margins of the excretory vesicle to the lateral fields of the preacetabular region. The excretory vesicle is saccular to tubular, thick-walled with a single layer of columnar cells and lies on the median line to the mid-level of the body. Main collecting ducts extend from the anterolateral margins of the excretory vesicle to slightly beyond the eyespots, where each receives a short anterior and long posterior branch; 66 flame cells are found on each side. Collecting ducts, branches and flame cells are mainly found near the strands mentioned above. A long genital anlage is slightly discernible on the median line from the anterior end of the excretory vesicle to the posterior end of the acetabulum. The tail is long, aspinose and filled with parenchyma deeply stainable with neutral red and spotted by brown granular bodies. In heat-killed specimens, the tail extends anteriorly at an acute angle to the body (Fig. 1c).

The present cercaria is photopositive and swims most of the time by lashing the tail from side to side or spirally at an acute angle to the body which are contracted into a disc-shape (Fig. 1d). When resting, the larva sinks to the bottom, ventral side up, with the body flattened and the tail lashing slowly (Fig. 1e).

The redia is long and tapers posteriorly (Fig. 1f). A well developed pharynx is followed by a short intestine. It contains 5-15 immature cercariae and some germ balls. Some immature cercariae are equipped with differentiated ocelli and a relatively short tail. The maturation of cercariae occurs individually in the digestive gland of the host after immature cercariae leave the redia. Rediae and cercariae emerged from rediae occur and migrate in the intertubular spaces of the digestive gland resulting in degenerative alterations in the glandular cells (Fig. 2). The gonad of the infected shells are atrophied.

Remarks

The present species resembles to the four
following cercariae: *Cercaria caribbea* XXXIV (CABLE, 1956), *C. caribbea* LXXII, *C. caribbea* LXXIII (CABLE, 1963) and *C. portosacculum* (HOLLIMAN, 1961), in having the following characteristics; spination on the cuticle, well developed suckers, presence of eye-spots, a long prepharynx, several pairs of penetration gland cells, I-shaped excretory vesicle, collecting ducts and flame cells restricted mostly along the strands, commato sausage-shaped minute bodies packed in the hindbody, a long tail extending at an acute angle to the body in heat-killed specimens and development in redia. However, all of these described species are equipped with a caudal bulb or sac from which a long tail extends. In addition, the present species is also characterized with the arrangement of five pairs of penetration gland cells. Five pairs of penetration gland cells of *C. caribbea* XXXIV is located between eye-spots and acetabulum (CABLE, 1956). *C. caribbea* LXXII has four pairs of large penetration gland cells anterolateral to the acetabulum and two pairs of small ones close to the midline anterior to the pharynx. *C. caribbea* LXXIII has five pairs of large ones anterolateral to the acetabulum and several pairs of small ones near midline anterior to the pharynx (CABLE, 1963). *C. portosacculus* has four pairs of large ones extending from the level of eye-spots to the midlevel of the acetabulum and some small ones close to the midline anterior to the pharynx (HOLLIMAN, 1961). Therefore, the present species distinctly differs from all of the species and is regarded as a new species. Caudal appendages of these related species vary in shape from species to species. The present cercaria having a simple tail may be the most primitive form among these cercariae based on caudal morphology.

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**References**


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神奈川県産のナガニシに寄生する海産セルカリアの1新種

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神奈川県三浦半島三戸産の海産巻貝ナガニシの中腸腺から Acanthocolpidae に属すると推測されるセルカリアを検出し、新種と認め Cercaria itoi sp. nov. と命名記載した。本種は眼点を有する大形のセルカリアで、細長い尾を有する。口吸盤、肛吸盤、咽頭がよく発達している。仮入腺細胞は5対であり、体側の3対と体中央寄りの2対の2群に分けられる。排泄器は長い囊状である。66 対の炎細胞が観察された。被囊腺と考えられる棒状あるいは溝曲した棒状の小体が後体部背側に充満している。単性虫はレディアであり、セルカリアは未成熟の状態でレディアから出て、宿主の中腸腺の中で成熟する。

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