***Cercaria corbiculae* sp. nov. in a Brackish Water Clam
Corbicula japonica PRIME from Lake Shinji,
Shimane Prefecture, Japan**

Shigeru SHIMURA

*Department of Fisheries, Faculty of Agriculture, University
of Tokyo, Yayoi, Bunkyo-ku, Tokyo 113, Japan*

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A monorchiid cercaria was found in a brackish water clam *Corbicula japonica* collected from Lake Shinji, Shimane Prefecture, Japan, and a new name *Cercaria corbiculae* sp. nov. is proposed. The present species is a distome, pharyngeate cercaria with a slender long tail, no stylet, no eyespots, long ceca, three pairs of penetration gland cells, 16 flame cells, a saccate excretory vesicle deflected to left.

Introduction

In the course of a series of parasitological investigation on marine and brackish water cercariae, a new cercaria was discovered in *Corbicula japonica* collected from Lake Shinji, Shimane Prefecture. *C. japonica* is a brackish water clam living in estuaries and lagoons on bottom of silty sand, and one of important commercial shellfishes in Japan. The present paper describes the cercaria under the name *Cercaria corbiculae* sp. nov.

Materials and Methods

Samples for the present study were collected from Lake Shinji, Shimane Prefecture (map reference, 35°27'N, 132°58'E). A total of 419 *Corbicula japonica* were taken in March and November 1982. They were examined for cercariae by dissecting their soft body under a binocular dissecting microscope. A squash preparation of the soft body was also examined for encysted trematodes. For morphological observations of the cercaria, especially of the excretory system, living specimens were gently flattened under coverslip pressure and sealed with clear finger-nail polish. The description was based on mature cercariae, both living and preserved in formalin. Neutral red was used as intravital stain. Measurements were made on twenty mature specimens

fixed in hot formalin without excessive coverslip pressure. Semidiagrammatic drawings were made to scale from such measurements. For histological examination, the gonad and digestive gland of infected clams were fixed in formalin, embedded in paraffin, and sectioned at 4-6 μ m. Sections were stained with Ehrlich's hematoxylin and eosin.

Description of the Species

Presumptive adult form: Monorchidae

Host: *Corbicula japonica* PRIME (Corbiculidae)

Locality: Lake Shinji, Shimane Prefecture

Date and infection rate:

March 7, 1982: 1/184 (0.5%)

November 12, 1982: 6/510 (1.2%)

Measurements: mean (range in parentheses)
in microns

Cercaria

body
..281 (266-295) long by 100 (90-109) wide;
oral sucker
.....49 (46-51) long by 47 (44-51) wide;
prepharynx.....8 (0-12) long;
pharynx
.....19 (17-22) long by 19 (17-22) wide;
acetabulum
.....46 (41-51) long by 46 (44-51) wide;
tail
....203 (179-223) long by 20 (29-31) wide;

Sporocyst

body

861 (637–1,009) long by 264 (216–314) wide.

Specimen: Meguro Parasitological Museum,
Tokyo:

MPM Coll. No. 19370

Specific Description (Figs. 1, 2)

Distome, pharyngeate cercaria with a slender long tail (Fig. 1a). The body surface is covered with minute, backward directed spines being more sparse posteriorly than anteriorly. No sensory hairs are recognized. The oral sucker is well developed, globular, and located at the anterior end of the body. The stylet is absent. The mouth opening is followed by a short prepharynx. The pharynx is globular. The digestive tract bifurcates a short distance anterior to the acetabulum into two long and slender ceca running through the lateral field near to the posterior end. The tract is deeply stainable with neutral red. Eye-spots are lacking. Three pairs of penetration gland cells are situated in the middle part of the body, immediately anterior to the acetabulum. Their ducts on each side of the body twist into one bundle, run anteriorly and separate individually to open near the apical end of the oral sucker. The penetration gland cells are faintly stained with neutral red, but their ducts are deeply stained. The acetabulum is also well developed, almost equal in size to the oral sucker, and situated in the posterior part of the middle third of the body. The genital anlage is slightly discernible in the postero-dextral part of the acetabulum. The excretory vesicle is large and long, lined with a layer of epithelial cells, extending to the anterior end of the acetabulum, displacing sinistrally in the middle part by the genital anlage and then curved inward at its anterior end. Main collecting ducts are ciliated, arise on each lateral side in the middle part of the vesicle, run forward, and divide into an anterior and a posterior branch on the middle level of the acetabulum. Each of these branches drains two sets of two flame cells; thus the flame cell formula is $2[(2+2)+(2+2)] = 16$. The slender and aspinose tail is about

two thirds of body length. No caudal excretory tube is observed.

The sporocyst is oval, thick-walled with a birth pore at one end, contains 3–7 cercariae and some germ balls (Fig. 1b). Sporocysts are only found in the gonad by histological observations. Reproductive cells of the host

Fig. 1. *Cercaria corbiculae* sp. nov. a: cercaria, general feature, ventral view, b: ripe sporocyst with mature cercariae and germ balls.

Fig. 2. Cross section of gonad and digestive gland of *Corbicula japonica* infected by sporocysts of *Cercaria corbiculae*, sp. nov. C: cercaria, D: digestive gland, G: germ ball, S: sporocyst wall. Scale bar, 200 μ m.

are almost completely lacking. The digestive gland is not infected (Fig. 2).

The specific name, *corbiculae*, refers to the generic name of the first intermediate host.

Discussion

Following characteristics of the present cercaria probably demonstrate inclusion in the family Monorchiidae (CABLE, 1956; HOLLIMAN, 1961); distome, pharyngeate, no stylet, thick-walled saccate excretory vesicle, 16 flame cells, and development in sporocyst. Monorchiid cercariae with a long tail have been reported only a few; cercaria of *Monorchoides cumingiae* (= *Cercaria cumingiae*) (MARTIN, 1938, 1940), cercaria of *Postmonorchis donacis* (YOUNG, 1953), *Cercaria caribbea* LXIII, *C. caribbea* LXIV (CABLE, 1963), *C. ophicerca* (PALOMBI, 1934), *C. longicaudata* (BARTOLI, 1966), *C. cerastodermæ* I (SANNIA and JAMES, 1978). The first three species have eyespots, two pairs of penetration gland cells, short ceca and a long tail bearing peculiar lateral lappets on each side. *C. ophicerca* and *C. longicaudata* have eye-spots and a very long tail. *C. cerastodermæ* I has four pairs of penetration glands and a V-shaped

excretory vesicle and develops in a unique sporocyst. *C. caribbea* LXIV has a saccate excretory vesicle deflected to left and no eyespots. *C. caribbea* LXIV seems to be closely related to the present cercaria. But the former is much smaller than the latter, and has two pairs of penetration gland cells and indistinct ceca. Therefore, the present cercaria clearly differs from all described species and is regarded as a new species.

Cercariae of some monorchiid trematodes were reported to leave the host and to encyst in the same host or in another pelecypod (MARTIN, 1940; YOUNG, 1953; DEMARTINI and PRATT, 1964). A squash preparation of the soft body of *Corbicula japonica* was examined for trematodes, but no encysted metacercariae were observed.

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島根県穴道湖産のヤマトシジミに寄生するセルカリアの1新種

志 村 茂*

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島根県穴道湖産のヤマトシジミから Monorchidae に属するセルカリアを検出し、新種と認めて *Cercaria corbiculae* sp. nov. と命名記載した。本種は細長い尾を備えたセルカリアで、口吸盤、咽頭、腹吸盤がよく発達しており、眼点と穿刺棘を持たない。侵入腺細胞は3対ある。排泄嚢は長い嚢状で、前半部が左側に偏向する。炎細胞式は $2[(2+2)+(2+2)]=16$ である。セルカリアはスポロシスト内で发育する。

* 東京大学農学部水産学科