

A NEW CYSTOCERCOUS CERCARIA *

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The cercaria described in this paper was found in the liver of *Goniobasis livescens* taken in the Oneida River near the outlet of Lake Oneida, in the State of New York. To it may be given the name *Cercaria fusca*. Twenty-three snails of the above mentioned species were examined, and of these, four were infected with small numbers of this cercaria. The color of the living worms is brown, the tail being much darker brown than the body. They were very sluggish when taken from the snails and moved very little, and made no swimming motions. The length of the extended live cercaria was about 3 mm., the body being about 1 mm. in length and the tail 2 mm.; the length of the flat tail-forks was about 0.5 mm. (Fig. 1a). Sporocysts were also found in the snails, which contained each from one to four or five cercaria in various stages of growth. The sporocysts are mostly lenticular in shape and 2 or 3 mm. in length. The largest of them contained but a single cercaria, which thus had the appearance of being encysted. One sporocyst observed, in which were several cercariae of different sizes, contained one apparently full grown, the tail of which projected freely from the sporocyst, giving the impression of a sporocyst with a tail.

These observations seem to support the statement of Faust (1918: 149) that the cystocercous cercariae may be cannibalistic. The largest cercaria in a sporocyst seems to feed upon, or at least absorb, the smaller ones until it is finally the only one left. I did not observe in the material studied any instance of the direct attack of a large cercaria upon a smaller one.

Cercaria fusca is similar to *C. brookoveri* Faust, 1918, in that the young distome is not surrounded by the walls of the anterior portion of the tail, as is the case in other cystocercous cercariae observed, but is joined with the tail by a short fold.

The shape of the body of the full-grown cercaria is pyriform (Fig. 2), the hinder end being the broader, where the width is 0.65 mm. The cross section is oval in shape, the thickness being 0.40 mm. The suckers are large. The oral sucker is an elongated organ 0.52 mm. long, 0.35 mm. wide and ventral in position. The acetabulum is

* This study has been made as a part of the ecological survey of Oneida Lake, being made under the direction of Prof. C. C. Adams of the New York State College of Forestry, Syracuse, N. Y.

just behind the middle of the body and measures 0.24 mm. in diameter. The pharynx has a diameter of 0.13 mm. and opens into a very short esophagus, which in turn leads into the two limbs of the intestine, each of which passes in the lateral area of the body to its hinder end. They are filled with a translucent secretion.

The median excretory trunk is short, passing from the hinder end of the body to a point immediately back of the ovary and dorsal to the testes, from which the two lateral limbs pass forwards in the dorsal area of the body to the right and left of the acetabulum. The testes and ovary are all spherical organs forming a group immediately back of the acetabulum and near the hinder end of the body. The two testes are close together in the same transverse plane, and in the ventral area of the body; each has a diameter of 0.13 mm. A large cirrus sac lies dorsal to the acetabulum. The ovary is slightly smaller than either of the testes and lies between and in front of them towards the dorsal

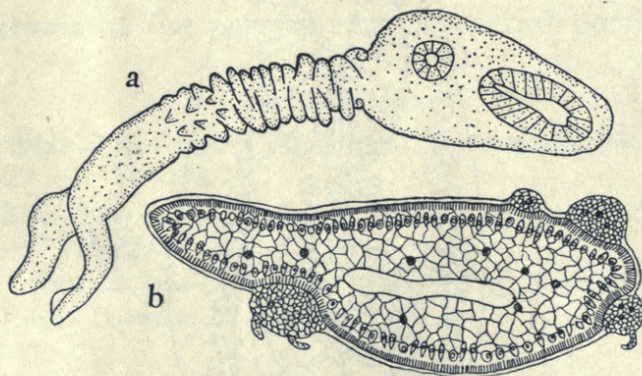


Fig. 1.—(a) *Cercaria fusca*, $\times 42$. (b) Cross section of anterior portion of tail, $\times 400$.

side of the body. A large receptaculum seminis lies alongside of the ovary. The uterus passes forwards to the oral sucker and thence back to the genital pore, immediately in front of the acetabulum. It contains a few large eggs which average about 78 by 49μ in size. The full grown cercariae are thus sexually mature and in this respect resemble *C. macrostoma* Faust.

The vitelline glands occupy the two lateral areas of the body from the oral sucker to the hinder end of the body, and consist of a large number of small follicles.

The tail of the full grown cercaria is flattened in shape and has a width of 0.27 mm. and a length of 2 mm. Each of the two forks of the tail is 0.5 mm. long and 0.27 mm. wide at its base. The tail is made up of two very distinct regions, the anterior two-thirds and the posterior third. The former region is distinguished by the presence of conspicuous warts and transverse ridges on its surface, similar to

the warts which have been observed in other cystocercous cercariae. It is also considerably thicker than the posterior region, having an oval cross section (Fig. 1, b). In the anterior portion is a large open space in the parenchyma which represents the excretory trunk.

The parenchyma of the tail is large meshed with numerous nuclei, and contains very conspicuous subcuticular cells and longitudinal and circular muscle fibers. The longitudinal fibers are wide bands lying close together and extending the length of the tail; it is by the contraction of them that the animal exercises the energetic swimming motions observed by Ward in *C. anchoroides* (1916:12). The subcuticular cells form a very regular row which lies just within the longitudinal muscle fibers. They are mostly elongate or pear-shaped

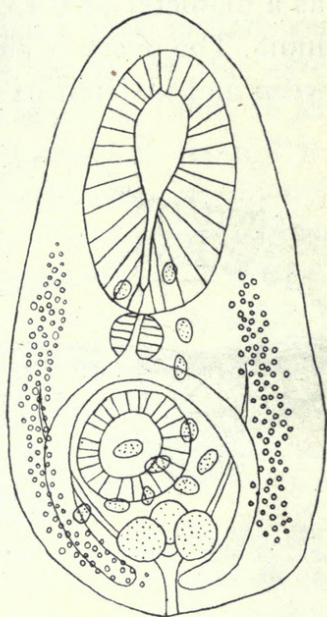


Fig. 2. Ventral aspect of distome with internal organs, $\times 125$.

cells, the pointed ends of which extend towards or between the longitudinal muscle fibers. The warts contain no subcuticular cells and no muscle fibers but are composed entirely of a very close-meshed parenchyma in which lie a few nuclei, bounded on the outer surface by a cuticula. On the summit of many of the larger warts are one or two short, curved, finger-like projections. The circular and longitudinal muscle fibers and the subcuticular cells pass across the base of the warts, which thus lie entirely outside of them.

The posterior third of the tail together with the two flat tail-forks are similar in structure to the anterior two-thirds, except that they are much flatter and lack the warts. They also lack the wide excretory space of the anterior portion. Instead of this a narrow excretory canal passes through the middle, and branching at their base extends to the end of each of the forks.

Cercaria fusca is similar in structure to *C. macrostoma* Faust, and like that worm probably belongs to a species of distome allied to *Allocreadium*. It is also probable that *C. macrostoma* escaped from *Goniobasis pulchella*, inasmuch as that snail was present in the aquarium in which the worm was found swimming (Faust, 1918: 150).

The very regular arrangement of the subcuticular cells in the tail of *C. fusca*, as above described, and their frequent elongation between the longitudinal muscle fibers towards the cuticula would seem to give weight to the theory, so popular at present among helminthologists and morphologists generally (see Pratt, 1909), which regards them as a modified hypodermis, the function of which is to secrete the cuticula. The structure of the warts, however, does not give support to this theory, but disproves it, in that they contain no subcuticular cells but yet possess a well-defined cuticula. The subcuticular cells which pass along the base of a wart are separated from it by both the longitudinal and circular muscle fibers and bear no relation to it. They are portions of the parenchyma of central portion of the tail.

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