Biological Sciences

TWO STYLET CERCARIAE FROM DOUGLAS LAKE, MICHIGAN

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The recent use of several Xiphidiocercariae from Douglas Lake in certain cytological studies prompted an attempt to describe some members of this rather difficult group. The material for the two stylet cercariae descibed in this paper was collected during th early part of July, 1928, on the shores of Douglas Lake, Michigan.

Cercaria exilis, N. Sp.

A stylet cercaria was found infesting *Limnaea exilis*, and it is proposed to call it *Cercaria exilis*, taking the species name from that of the host. The infested snails were kept in small bottles and the cercariae studied as they swarmed from the host. Upon dissecting the snails, it was found that the cercariae had developed in elongate, sac-like sporocysts.

On a sub-stratum, *Cercaria exilis* displays a measuring-worm movement by taking hold first with the oral, then with the ventral sucker. The motions in this mode of progression are regular and even. When free in water, the cercaria swims by vibrating both body and tail.

To eliminate inaccuracies in measuring that are likely to result from contraction of the cercariae while alive, and the expansion that always takes place after the animals die, the specimens to be used for measurement were killed in hot Gilson's solution. The average of the measurements were as follows:

	Microns
Length of body	175.
Width of body	93.5
Length of tail	94.
Width of tail	24.
Diameter of oral sucker	43.5
Diameter of ventral sucker	33.
Length of stylet	28.8

The tail had a fin-fold on the dorsal side running the length of the fold. Although no measurements of its height were possible, it appeared to be about one-half the width of the tail.

The stylet is spear-shaped with a knob on the posterior end. The sides are thickened at the place where the point begins to taper. Hollow construction is indicated by a rectangular light area above the lumen.

There are six penetration glands on each side of the ventral sucker. On each of the tubules that lead from these glands to the stylet, there is a slightly enlarged portion toward the anterior end lying approximately opposite the center of the oral sucker. These are interpreted as vesicles for the storage of secretion from the glands.

The oesophagus branches to form two intestinal ceca that terminate on a level with the base of the ventral sucker. The pharynx is located about one-fourth of the distance from the oral to the ventral sucker.

A heavy cuticula bears very fine, backward-pointing spines, so arranged as to make a cross-hatch pattern over the entire body. Prominent cystogenous glands are found from the oral sucker to the posterior end of the body.

One of the difficulties encountered in describing the stylet cercariae is that the excretory system is very difficult to work out. Nothing could be determined of the pattern of the excretory system of *C. exilis* aside from the bladder which is shown in Plate I figure 1.

Specific diagnosis of *Cercaria exilis*. Xiphidiocercaria with well developed oral and ventral suckers and without eyespots; from *Limnaea exilis* Lea found at Douglas Lake, Michigan; intestinal ceca reaching to posterior of ventral sucker; penetration glands, six, located lateral to the ventral sucker; oral sucker about one-third larger than ventral sucker; cuticular spines, very fine and backward-pointing, forming a cross-hatch pattern over entire body; fin-fold running length of tail; stylet, spear-shaped and hollow; flame-cell pattern not discernible.

Cercaria campanulatus, N. Sp.

A stylet cercaria was found near Hook Point in Douglas Lake infesting *Planorbis campanulatus* smithii. It is proposed to name this species *Cercaria campanulatus,* the species name being taken from that of the host. These cercariae develop in elongate sacular sporocysts (Plate I, figure 4) in which no rudiments of organs could be distinguished from unstained specimens.

The movement of this form when free in water is very active and oscillating in motion. On a sub-stratum, it extends the anterior portion of the body, anchors with the oral sucker, and then contracts the entire body. After each time it takes hold with the ventral sucker, it shakes its tail violently. When under a cover slip with plenty of water it moves as on a substratum, but after completing several cycles of its characteristic motion it violently shakes the entire body and tail.

Measurements taken from specimens killed in hot Gilson's solution gave the following average dimensions:

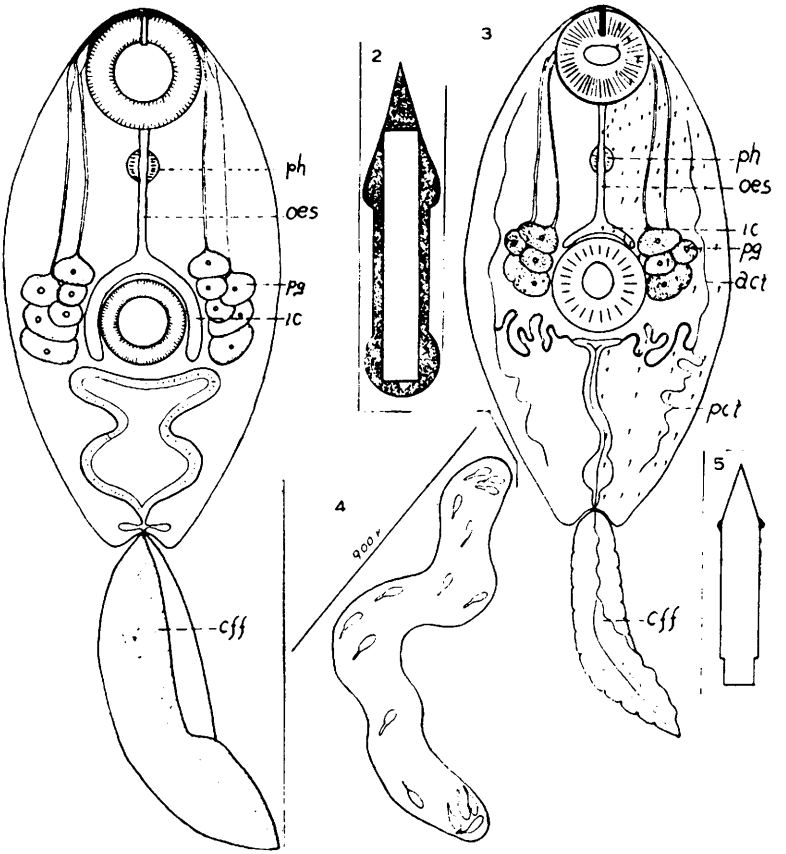

PLATE I

Length of body	195 microns
Width of body	98 microns
Length of tail	86 microns
Width of tail	28 microns
Diameter of oral sucker	42 microns
Diameter of ventral sucker	40 microns
Length of stylet	18 microns
Length of sporocyst	1900 microns

A fin-fold extends the entire length of the tail.

The stylet, Plate I, fig. 5, is regular in shape except for a ring at the place where the point begins to taper. The shaft is smaller at the posterior end where the insertion occurs.

There are four penetration glands on each side of the ventral sucker. The posterior gland is bi-lobed.

The pharynx occurs on the oesophagus about half way between the suckers. The intestinal ceca are short, each extending only about one-fourth of the way around the ventral sucker.

The spines are rather prominent and form a pattern on the body as shown in Plate I, fig. 3.

The bladder is elongate with two cornua which are continuous with the collecting tubes. The flame cell pattern could not be determined.

Specific diagnosis of *Cercaria campanulatus.* Xiphidiocercaria with well developed oral and ventral suckers and without eyespots; from *Planorbis campanulatus* smithii, found near Hook Point, Douglas Lake, Michigan; intestinal ceca extend about one-fourth of way around ventral sucker; penetration glands four, located lateral to ventral sucker; oral and ventral suckers approximately the same size; cuticular spines prominent, covering the entire body; fin-fold runs the lenth of the tail; shaft of stylet narrower at insertion and with a ring at the place where it starts to taper; bladder divides into two horns at anterior end; flame cell pattern not discernible.