

A New Zoogonid Cercaria (Trematoda: Digenea) from the Florida Horse Conch, *Pleuroploca gigantea*, in the Northwestern Gulf of Mexico

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ABSTRACT: A seventh known species of larval zoogonid is reported, which was found parasitizing the gonad and digestive gland of the large carnivorous gastropod mollusc *Pleuroploca gigantea* collected in the Gulf of Mexico southeast of Galveston, Texas. Descriptions of the sporocyst and cercarial stages are given. The larva is assigned the temporary designation of “zoogonid *Cercaria A*” until further information concerning its life cycle and specific identity becomes available. The morphology of the cercaria most nearly resembles that of the cercaria of *Zoogonoides viviparus* (Olsson, 1868) Odhner, 1902, from which it differs by its lack of a prepharynx and lack of anterolateral indentations in the stylet. Other differences are in body size, host species, and host geographic range.

KEY WORDS: Zoogonidae, cercaria, marine cercaria, *Pleuroploca*.

Adult zoogonid trematodes are parasites of the digestive tracts of marine fishes. In those species for which life cycles are known, tailless xiphidiocercariae develop in sporocysts in marine snails and subsequently encyst to become metacercariae in a variety of benthonic invertebrates of limited mobility such as polychaete annelids and echinoderms (Stunkard, 1938, 1940, 1941, 1943; Prevot, 1966; Koie, 1976). In one species, however, cercariae apparently encyst within the sporocyst in the snail host (Palombi, 1930, 1934).

Of the known species of zoogonid cercariae, as tabulated by Madhavi and Shameem (1991), 2 have been reported from the western Atlantic Ocean (Stunkard, 1940, 1941). None has been reported from the Gulf of Mexico.

Materials and Methods

Trawl samples from the Gulf of Mexico 18–20 km southeast of Galveston, Texas, at a depth of 5–6 m yielded 5 specimens of the large carnivorous gastropod *Pleuroploca gigantea*, which were examined for parasites. The snails ranged from 83 to 263 mm in total shell length.

Figures of sporocysts and cercariae were prepared freehand from living material stained with neutral red in seawater under light coverslip pressure at magnifications of $\times 100$ –1,000. Measurements (in micrometers) were taken from 10 naturally shed heat-killed specimens under light coverslip pressure. Measurement ranges are followed by mean values in parentheses. Specimens were fixed in formalin–acetic acid–alcohol, stained with acetocarmine, dehydrated in alcohol, cleared in xylene, and mounted in Permount medium.

Results

The smallest of the 5 *Pleuroploca gigantea* examined (83 mm) was infected with a new zoogonid larva, which is described below.

Zoogonid *Cercaria A* (Figs. 1, 2)

DESCRIPTION: Body of tailless cercaria (Fig. 1) 220–315 (271.3) long, 55–77 (65.9) wide. Tegument aspinose anteriorly, becoming minutely spinose posteriorly. Posterior spines up to 1 in length. Mouth ventral and subterminal, oral sucker circular, 35–43 (39.2) in diameter. Stylet anterodorsal to oral sucker, lanceolate, 8–12 (10) long, 4–6 (5) wide. Prepharynx absent, pharynx doliiform, 15–27 (21) long, 9–16 (12.8) wide. Esophagus bifurcating anterior to ventral sucker, forming crura that extend posterolaterally terminating anterior to midlevel of ventral sucker. Contents of crura staining red in neutral red vital dye. Ventral sucker circular, 48–61 (53.3) in diameter, its anterior margin located at midlevel of body. Six pairs of granular penetration glands located in anterolateral portion of body, their ducts extending forward on each side in a bundle dorsolateral to oral sucker, terminating in anterior pores. Penetration glands and ducts staining light pink in neutral red stain as do 3 irregular and indistinct genital primordia posterior to ventral sucker. Excretory bladder oval, 45–57 (53.8) long, 30–45 (37.7) wide, thin-walled, loosely packed with evenly distributed spherical concre-

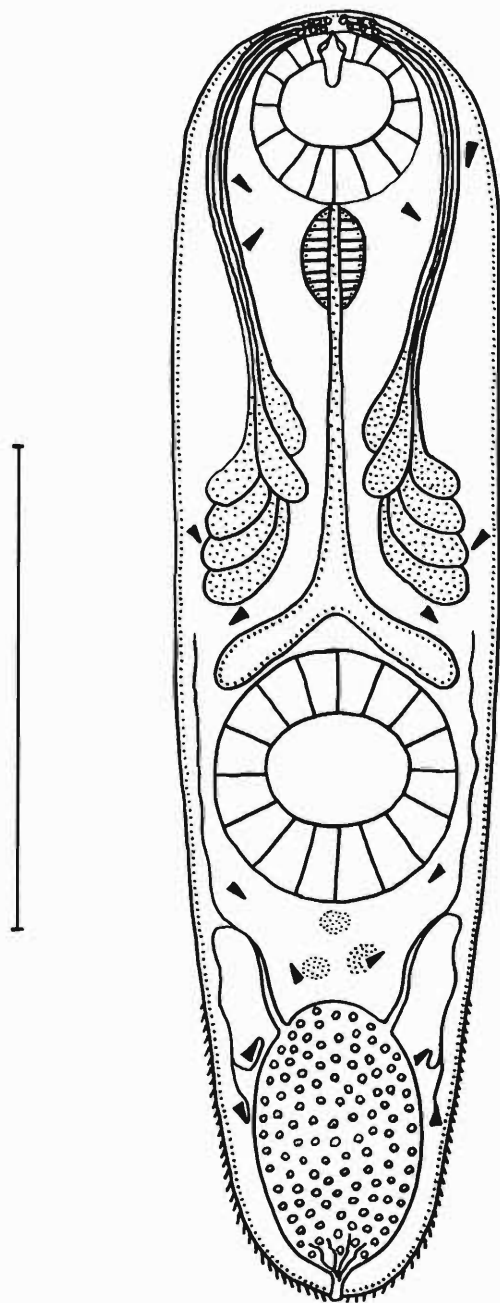


Figure 1. Zoogonid *Cercaria A* from *Pleuroploca gigantea*. Ventral view. Scale bar = 100 μm .

tions about 2 in diameter. Excretory pore posterior and terminal, communicating with bladder through excretory tube 8 in length. Flame cell formula $2[(2 + 2) + (2 + 2)] = 16$. Right and left common excretory tubules enter bladder anterolaterally.

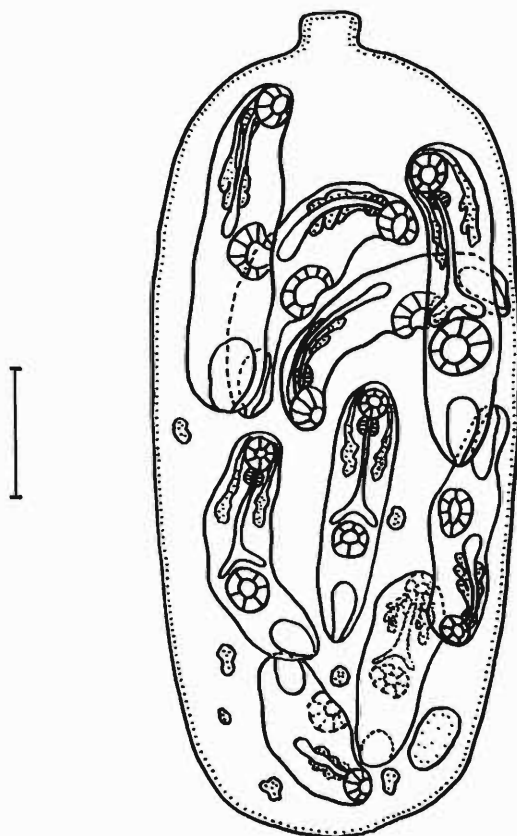


Figure 2. Sporocyst stage of Zoogonid *Cercaria A* from *Pleuroploca gigantea*. Lateral view. Scale bar = 100 μm .

Cercariae, which emerged from sporocysts, were observed crawling vigorously on substrate surface.

Sporocysts (Fig. 2) located in gonad and digestive gland of host snail, thin-walled, transparent and nonpigmented, 650–750 (685) long and 280–370 (315) wide, each containing up to 10 cercariae in various stages of development.

HOST: *Pleuroploca gigantea* (Kiener, 1840), Florida horse conch.

LOCALITY: Gulf of Mexico, 29°10'N, 94°42'W, southeast of Galveston, Texas.

HABITAT: Sand-mud substrate, depth 5–6 m.

PREVALENCE OF INFECTION: 1 of 5 snails (20%).

VOUCHER SPECIMEN: U.S. National Parasite collection, Beltsville, Maryland, 20705. USNM No. 82738.

Discussion

When compared morphologically to the previously reported zoogonid larvae, as tabulated

by Madhavi and Shameem (1991), *Cercaria* sp. A appears to be a separate species. *Cercaria* sp. A differs from the cercaria of *Diptherostomum brusinae* Stossich, 1904 (synonym: *Cercaria inconstans* Sinitzin, 1911), and from *Cercaria chilkaensis* Madhavi and Shameem, 1991, in having more than 3 pairs of penetration glands. It differs from *Cercaria brachycaeca* Shimura and Ito, 1980, and from *Cercaria crispata* Pelseneer, 1906, in having intestinal crura that extend to the level of the ventral sucker and in having an excretory bladder with a convex anterior margin. It differs from the cercaria of *Zoogonoides laevis* Linton, 1940, and from the cercaria of *Zoogonus lasius* (Leidy, 1891) Stunkard, 1940, in having intestinal crura that do not extend posterior to the ventral sucker.

Cercaria sp. A appears to be most similar to the cercaria of *Zoogonoides viviparus* (Olsson, 1868) Odhner, 1902, from which it differs in its lack of a prepharynx and anterolateral indentations of the stylet (as illustrated by Lebour, 1918). Other differences are in body size, host species, and host geographic range.

This constitutes the first report of a zoogonid larva from the Gulf of Mexico and the second report of a trematode species parasitizing the Florida horse conch, *Pleuroploca gigantea*. Wharton (1939) reported the occurrence of the nymph stage of the aspidogastrea *Lophotaspis vallei* (Stossich, 1899) Looss, 1902, from Florida, employing the older synonymous name for the horse conch, *Fasciolaria gigas* Linne.

It is interesting to note that, with the exception of the turbinid archaeogastropod host (*Batillus*) of *Cercaria brachycaeca*, all known gastropod hosts for the sporocyst and cercarial stages of zoogonids (Madhavi and Shameem, 1991) belong to the predaceous and carnivorous neogastropod superfamily Buccinoidea, which includes the families Buccinidae (*Buccinum*), Columbellidae (*Mitrella*), Nassariidae (*Nassarius*, *Ilyanassa*), Naticidae (*Natica*), and Fascioliariidae (*Pleuroploca*). It is quite likely that the movement of these predatory host gastropods between their invertebrate prey population centers may facilitate acquisition of second intermediate hosts by the tailless, nonswimming zoogonid cercariae, which are capable of crawling only short distances among the benthos during transmission.

Cercaria brachycaeca, although tailless and bearing overall morphological similarities to zoogonid cercariae, might ultimately be proven to be a tailless opecoelid larva due to similarities in excretory system morphology, development in an elongated sporocyst with many cercariae, and utilization of an archaeogastropod first intermediate host, which is the host type used by the majority of typical opecoelid larvae.

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