Euclinostomum heterostomum Metacercariae
(Trematoda: Clinostomatidae) from the Aquarium Ram, Apistogramma ramirezi (Pisces: Cichlidae)

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ABSTRACT: Euclinostomum heterostomum metacercariae were present in conspicuous swellings on two aquarium rams, Apistogramma ramirezi, imported from Hong Kong. The larvae were individually encapsulated in the striated muscles, with no evident inflammatory response. This is a new host record for the genus and species and the first report from aquarium fishes.

There are few reports of trematode metacercariae infecting small aquarium fishes, and in most instances the larvae were not identified (Gratzek et al., 1978; Leibovitz et al., 1980). This is true even though millions of aquarium fishes are imported and exported each year from all over the world (Gratzek et al., 1978) and metacercariae are common in many fish species (Hoffman, 1970). The present report describes natural infections of rams (Apistogramma ramirezi) with Euclinostomum heterostomum metacercariae.

Case History and Methods

Two live rams showing conspicuous swellings were submitted to the Animal Disease Diagnostic Laboratory, Purdue University, for pre- and postmortem examination. The owner had purchased several of these fish from a local pet shop, which had obtained them from a Hong Kong supplier.

The fish were observed for 2 hr in a 40-liter aquarium tank at 27°C. One fish was killed and examined for helminths and Wright’s-stained blood smears examined for protozoans. The single metacercaria recovered was fixed in warm AFA and stained with Semichon’s carmine. The other fish was fixed in neutral buffered 10% formalin, after incising the abdominal wall along the ventral midline. Whole coronal slices (3–4 mm) were embedded in paraffin and 6-µm sections stained with hematoxylin and eosin.

Results and Discussion

One fish had a large (4 mm), gray, conspicuous swelling on the left side of the trunk adjacent to the dorsal fin. When examined later for helminths, a single living metacercaria (Fig. 1) was recovered from this swelling; no other lesions or parasites were seen. The other fish, later fixed in formalin, had three similar swellings (3–5 mm) in the head and nape regions. The nodules seemed to have an irritating effect, as both fish occasionally rubbed themselves against aquarium rocks.

Sections of the swellings revealed that each contained one metacercaria encapsulated in striated muscle (Fig. 2). The three slightly oval cysts in cross section measured 1,558 (1,137–1,958) µm long by 1,305 (1,010–1,516) µm wide. The cyst wall was composed of a thin layer of connective tissue, with no inflammatory
Figure 1. Whole mount of *Euclinostomum heterostomum* metacercaria from *Apistogramma ramirezi*. A, acetabulum; AT, anterior testis; CD, cecal diverticulum; CP, cirrus pouch; IC, intestinal cecum; OF, oral field; Oo, ootype; Ov, ovary; PT, posterior testis; UT, uterus; UtS, uterine sac. Semichon’s carmine, ×21.
Figure 2. Cross section through acetabular region of *E. heterostomum* metacercaria encapsulated in musculature of *A. ramirezi*. Note thin connective tissue wall, mild compression of surrounding muscle tissues, and lack of host inflammatory response. A, acetabulum; CW, cyst wall; IC, intestinal cecum. H&E, ×41.

response present. Except for some compression of surrounding muscle fibers by the cysts, no other histopathologic lesions were seen.

The whole-mount specimen was readily identified as *E. heterostomum* (Rudolphi, 1809) Travassos, 1928 from previous descriptions of this species (Travassos, 1928; Baer, 1933; Fischthal and Kuntz, 1963; Ukoli, 1966; Dennis and Sharp, 1973). The larva measured 5.73 mm long by 1.97 mm wide, with measurements of other structures falling into the ranges given for this species (see Dennis and Sharp, 1973). *Euclinostomum heterostomum* metacercariae are progenetic, and various sizes and stages of development may be found for individual specimens (Ukoli, 1966; Dennis and Sharp, 1973). The metacercariae of *E. africanum* (Stossich, 1906) Dollfus, 1932, *E. clarias* Dubois, 1930, and *E. indicum* Bhalerao, 1942 are regarded as synonyms of *E. heterostomum* (Van der Kuyp, 1953; Ukoli, 1966; Dennis and Sharp, 1973).

*Euclinostomum* adults are parasites of the oral cavity and esophagus of fish-eating birds, primarily herons and egrets. Although several *Euclinostomum* spp. have been described, Ukoli (1966) and Dennis and Sharp (1973) regard only *E. heterostomum* and *E. multicaecum* Tubangui and Masilungan, 1935 as valid species. Adult *E. heterostomum* have been reported from *Ardea cinerea*, *A. purpurea*, *Ardeola goliath*, *A. ralloides*, *Bulbicus ibis*, *Egretta garzetta*, *Nycticorax nycticorax*, *Scopus umbretta*, and experimentally from *Anhinga ruffa* and *Phalacrocorax africanus* (Dollfus, 1932, 1950; Baer, 1933; Ukoli, 1966; Dennis and Sharp, 1973; Prudhoe and Hussey, 1977).
The metacercariae of *E. heterostomum* exhibit little host specificity, as they have been reported from at least nine fish hosts belonging to five families: Anabantidae (*Anabas scandens, A. testudineus*), Channidae (*Channa (Ophicephalus) punctatus*), Cichlidae (*Apistogramma ramirezi, Tilapia heudeloti, T. nilotica, T. zilli*), Claridae (*Clarias angolensis*), and Cyprinidae (*Barbus canis*) (Joyeux and Houdemer, 1928; Dubois, 1930; Dollfus, 1932; Bhalerao, 1942; Srivastava, 1950; Van der Kuyp, 1953; Adiwinata, 1955; Fischthal and Kuntz, 1963; Paperna, 1964; Ukoli, 1966; Rai, 1970; Dennis and Sharp, 1973; present study). This report of *E. heterostomum* from *Apistogramma ramirezi* is a new host record and the first for this genus and species from aquarium fishes. Because the distribution of the intermediate and definitive hosts includes Africa, Asia, Europe, and South America, it is likely that *E. heterostomum* will be found in the future in aquarium fish from these areas.

The apparent irritation to the fish by *E. heterostomum* may have been caused by movements of the encapsulated larvae, because there was little host reaction to the metacercariae. The disfigurement produced by the larvae was apparently a reflection of the small size of this host as compared to other fish hosts. No other reports were found of *E. heterostomum* producing conspicuous swellings in fish hosts, and Ukoli (1966) stated that “metacercariae of *Euclinostomum* are usually encysted in the body cavity of fish.” There are reports of *E. heterostomum* in the body wall and musculature of *Anabas scandens, Channa (Ophicephalus) punctatus, Tilapia heudeloti,* and *T. zilli,* but no reference to any disfigurement (Joyeux and Houdemer, 1928; Srivastava, 1950; Ukoli, 1966; Rai, 1970). As compared to *E. heterostomum,* *E. multicaecum* has been seen encysted in the muscles and unencysted lying beneath the visceral peritoneum of *Channa (Ophicephalus) striatus* (Tubanguï and Masilungan, 1935; Velasquez, 1960).

Metacercariae are more common in tropical fish from South America than in those from the Far East (Gratzek et al., 1978). This is probably a reflection of husbandry practices, as fish originating from the Far East are usually aquarium raised and thus not exposed to snail hosts. The case reported here concerns a native Venezuelan fish imported from Hong Kong; it is not known where the fish were actually raised.

The whole-mount specimen has been deposited in the National Parasite Collection, Beltsville, Maryland, as USNM Helm. Coll. No. 77069.

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**Literature Cited**


