



## NEW RECORD OF TREMATODE METACERCARIA AS ZONOTIC PARASITE IN MULLET FISH OF THE SUDANESE RED SEA WATERS

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### ABSTRACT

**Objective:** this was a cross sectional study aimed to find out the prevalence and confirm the presence of fish borne zoonotic trematode - metacercaria in mullet fish obtained from the Sudanese red sea waters.

**Material and Methods:** a number of 50 mullet fish was selected for the study and examined using the Artificial Pepsin Digestion Experiment for the fish muscles. Prevalence of the parasite infection was calculated and working fishermen were investigated.

**Results:** Fish borne trematode metacercaria was found in only 12% of the examined fishes. No parasite cysts or eggs were found in all stool samples taken from fishermen.

**Conclusion:** The study is the first to report the presence of fish borne trematode metacercaria in the Sudanese Red Sea Coast.

**Key Words:** Metacercaria; Mullet Fish; Red Sea; Sudan

### INTRODUCTION

The Fish-Borne Trematode (FBT) infections affect the health of more than 80 million people around the world, particularly in Asian countries, but worldwide the number of people at risk, including those in developed countries, is more than half a billion. [1, 2, 3] Humans are usually infected with these flukes when they eat raw or inadequately cooked infected fish; [4, 5] remarkable morbidity and serious damage to aquaculture can be noticed [6]

Recently, a total of 59 FBT species, which are known to parasitize humans, are listed [7]. All species are divided into two groups, the small liver flukes (Opisthorchiidae) and the minute intestinal flukes (Heterophyidae, Echinostomatidae, and Nanophyetidae) [7].

The pathology of long standing infection by the liver flukes consists of biliary tract stasis, chronic inflammation, periductal fibrosis, and hyperplasia [8]. Development of the cancer cholangiocarcinoma is not uncommon; the International Agency for Research on Cancer has classed *Clonorchis sinensis* as first- group biological carcinogen in 2009. [9]

Intestinal flukes are generally not of considerable clinical importance compared to the liver flukes, but several

species may cause significant pathology, sometimes fatal; in the heart, brain, and spinal cord of humans [10, 11]. Eggs of intestinal flukes are difficult to differentiate from those of liver flukes, often causing misdiagnosis and inaccurate estimates of the prevalence of both trematode groups; [12] the number of infected people with intestinal flukes is believed to be higher than the number of people infected with small liver flukes [13].

Accordingly, elimination of these parasites from the food supply, especially fish, is a very important work in epidemiological point of view. This study was designed to find out the incidence and confirm the presence of fish borne zoonotic trematode - metacercaria in mullet fish in the Sudanese red sea waters.

### MATERIALS AND METHODS

This was a cross sectional study aimed to look for fish-borne trematode (metacercaria) in Sudanese red sea waters. A number of 50 isopod- infected fishes [14] were randomly selected. Fishes were measured to the nearest millimeter (standard length) and weight to the nearest gram. They were dissected to identify their sex.

Searching for zoonotic endo-parasites was done by using the Artificial Pepsin Digestion Experiment for the fish muscles. Physiological saline solution (0.9% NaCl 0.5 L)

was poured into a 500 ml- beaker and placed on a magnetic at 37°C with medium speed (about 900 rounds /min), then added 5ml of hydrochloric acid, 5g of pepsin, and 50 g of chopped fish muscle. Maximum time for digestion was 3 hours. After digestion, the digested material was sieved with saline solution into the sieves overlapped, the larger mesh being on the top. Only the material held in the 80 µm sieves was transferred into a sedimentation cone. Eventually, the undigested material held in the 1 mm sieve was treated as previously described to complete the digestion. After at least 30minutes of sedimentation in the cone, the supernatant was aspirated and the sediment was examined carefully under the stereo microscope. The experiment took about 1hour and 40minutes. Photos was taken by Samsung digital camera 10.1 mega pixels.

Prevalence of the parasite infection was calculated. Prevalence = number of infected fish /total number of fish examined.

Histological samples were taken from different parts of tongues of fishes infected by the isopod parasite and stained by heamatoxelin and eosin stain to see whether there was impact of mouth parasites in fish tongue tissue or not.

Stool samples were taken from 30fishermen and sent to the laboratory to look for H. heterophyes eggs or cysts.

A questionnaire was answered by fishermen and coast labors; it contained questions to assess health status, hygiene, and knowledge about fish- related diseases.

**RESULTS and DISCUSSION**

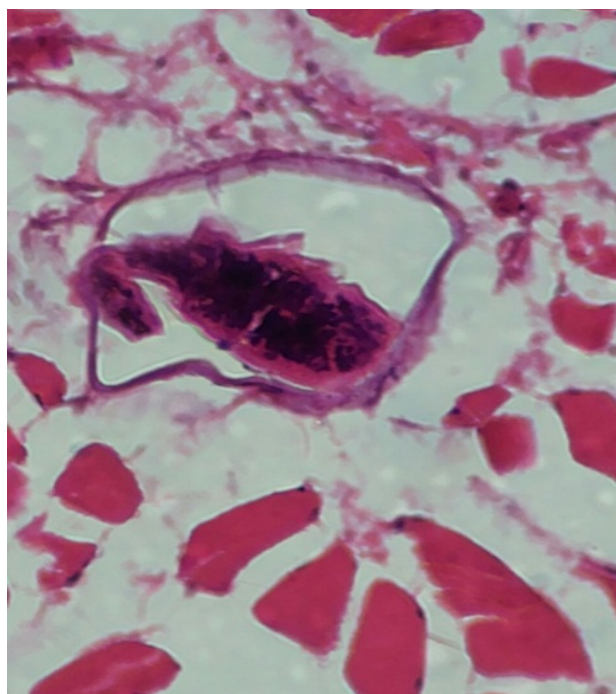
Types of fish examined for parasites are shown in table 1.

**Table 1: types and length of fish studied.**

Fish family and species	Range and mean of fish length (cm)
Mugilidae Valamugil Buchanani (local name: Quoy)	17.1 – 29.9 ( 25.02)
Valamugil Seheli	30 – 39.9 ( 34)
Mugil Cephalus ( local name: Abu geshra )	≥ 40

Result of the experiment: Fish borne trematode (F.B.T) metacercaria was found in only 6 of the 50 examined fishes (12%).

Result of Histology: Histological examination of slides from the affected tongue confirmed the presence of heterophyes metacercaria with hemorrhage and necrosis. (Figures 1, 2, and 3).



**Figure 1: Heterophyes Metacercaria between muscles**

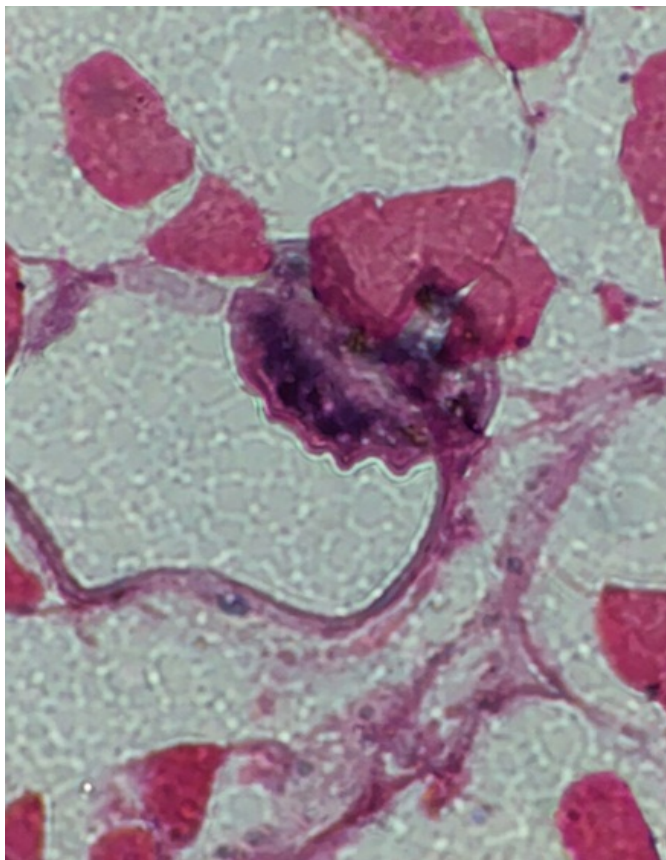


Figure 2: Heterophyes Metacercaria between muscles and fat

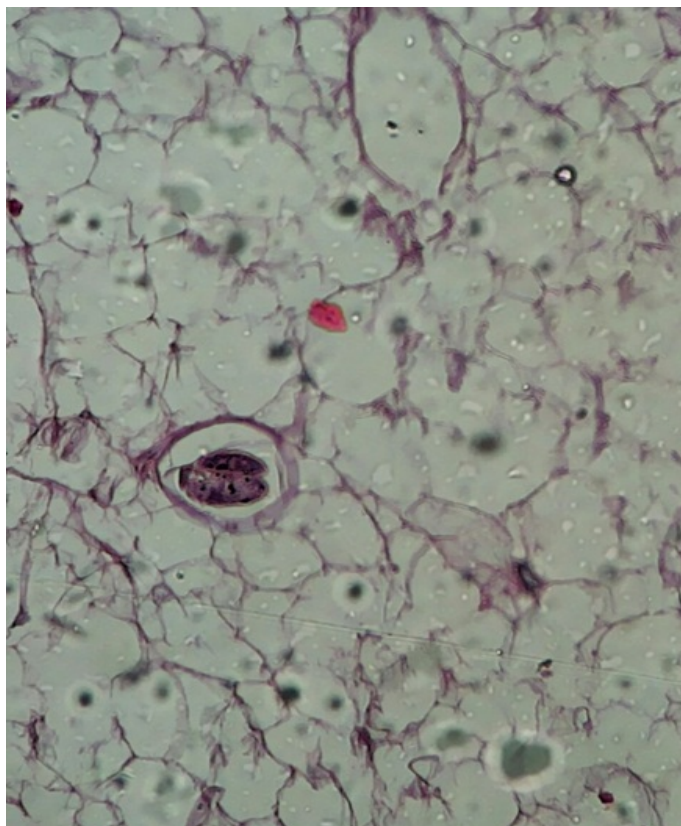


Figure 3: Heterophyes Metacercaria into connective tissue

Fishermen included in the study were 30 in number; all were over 30 years of age. About 87% of them worked in fishing for more than 10 years without using any special clothes for fishing and about 60% practiced fishing for more than 10 hours a day. No parasite cysts or eggs were found in all stool samples taken from the fishermen (negative infection by *H. heterophyes* parasite). This may be due to the fact that in our locality people usually do good cooking of fish and do not eat raw or uncooked fish. There is no history of detection of the cyst of *Heterophyes heterophyes* in all Port Sudan city laboratories.

#### CONCLUSION

This study gains its importance as it is the first recording of presence of zoonotic parasites and isopod parasites in mullet fishes in Sudanese red sea waters. In addition, the Sudanese habit of only eating well-cooked fish resulted in negative infection by these parasites.

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