

# MEDICALLY IMPORTANT METACERCARIAE (LARVA TREMATODS) IN KHUZESTAN. FISHES, IRAN

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**Abstract** - *Heterophyidosis* is a fish-transmitted disease in Khuzestan province, therefore a total of 900 fresh water fishes belonging to *Cyprinus carpio*, *Liza abu* and *Gambusia affinis*, were collected from canals of Mazreeh district in the central area of Khuzestan. In 44%, metacercariae of three small flukes of human including *Haplorchis taichui*, *Haplorchis pumilio*, *Stellantchasmus falcatus* were found. These metacercariae, are reported in Iran for the first time.

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**Key words:** *Metacercariae*, *Khuzestan fishes*, *Iran*

## INTRODUCTION

The family Heterophyidae comprises several genera and species of almost worldwide distribution. They are all small, oval, or pyriform flukes living in the intestine of fish-eating birds and mammals including man. Their life cycle involves a snail and a fish as first and second intermediate hosts. The flukes can adapt to a broad range of final (definitive) hosts (1).

Adult heterophyids, usually occurring in large numbers, inhabit the middle part of the intestine of their mammalian hosts, attached to, or embedded in, the intestinal mucosa. The flukes penetrate between the villi, sometimes reaching the crypts of Lieberkuhn. The life span of heterophyid flukes in the body of the mammalian host is brief, presumably only a few months. The second intermediate hosts of heterophyids, which harbor the infective metacercarial stage, are marine and fresh-water fishes which are consumed by infected mammals and birds. Ingestion of raw or inadequately cooked fish causes the infection in human (1, 2).

At least ten species, belonging to six genera

have been reported as human parasites, mainly in the orient, southeast Asia, some Pacific islands, Australia, the Mediterranean area, southern and eastern Europe, and in the west Africa. These species include: *Haplorohis taichui*, *H. pumilio*, *H. yokogawa*, *Heretophyes heterophyes*, *H. h.nocens*, *Meiagonimus yokogawai*, *H. Vanissima*, *Stellantchasmus falcatus*, *Centrocestus formosanus* and *Cryplocotyle lingua*. *Stellantchasmus falcatus* has also been recovered from many areas including the Asian Pacific region, the Philippines, Hawaii, Australia, and the Middle East, where the adult flukes have been recovered from cats, dogs, mice, birds and human (1).

*Cyprinus carpio* and *Liza abu* fishes, which are consumed as barbecued or roasted when inadequately cooked can serve as a source of infection in the community. These fishes are very abundant in canals of Mazreeh district and are commonly captured by local people. *Gambusia affinis* is not used as food by native people but it is a very important source of infection for fish-eating birds.

Epidemiological survey of 811 stool samples of a population in a swampy area located in the central area of Khuzestan, has shown that the frequency of Heterophyids infection is %8 (3). Recent investigation by the authors has shown heterophyids infection including *Haplorchis taichui*, *H. Pumilio*, and *Stellontchasmus falcatus*, in 1.9% and 37% in human and carnivores respectively (4). The latter study, led us to investigate the presence of medically important metacercariae in fishes of this area.

## MATERIALS AND METHODS

The study was carried out in Mazreeh district of central Khuzestan, that is limited in the north by the Ahu-Dasht area, in the east by Dez river, in the west by Karkheh river and in the south by Tavana large canal. This area has many canals, which branch out from Shahur river. Sampling was made on canals of Mazreeh district which is 90 km from Ahwaz.

A total of 900 fishes of 3 species including 210 *Cyprinus carpio*, 90 *Liza abu* and 600 *Gambusia affinis* were examined for the presence of metacercariae. Fishes were trapped by local fishermen and transferred in water to Health and Medical research center of Ahwaz city and then examined for presence of metacercariae on fins, muscles and subscales. Metacercariae were isolated by needle, and figures were drawn by camera lucida and identified (5). Measurements are all in micrometers, based on examination of living larvae.

## RESULTS

From a total of 900 fishes examined 55% of *Cyprinus carpio*, 56% of *Liza abu* and 39% of *Gambusia affinis* were infected with the metacercariae that include, *Haplorchis taichui*, *H. Pumilio* and *Stellantchasmus falcatus*. The results of metacercarial measurements are noted in Table 1 and the details of these species are as follows.

Table 1. Metacercarial measurements\* of heterophyidae species

Heterophyidae species	Metacercariae measuring	Oral sucker measuring
<i>Haplorchis pumilio</i>	190×180.5	70.5×58.75
<i>Haplorchis taichui</i>	237.50×190.0	47×35.75
<i>Stellantchasmus falcatus</i>	188×152.75	47×35.25

\* Measurements are all in micrometers

*Haplorchis pumilio* (Looss 1896) (Fig. 1). Host: *Cyprinus carpio*, *Gambusia affinis*, *Liza abu*; Localization in fish: fine, subscale; locality: Mazreeh canals; description: oval metacercaria; thin cyst wall, ventral sucker armed with crown of 38-40 sclerites; intestinal ceca reaching up to margin of excretory bladder; anlagen of testis situated in front of excretory bladder.

*Haplorchis taichui* (Nishigori, 1924) (Fig. 2). Host: *Cyprinus carpio*, *Gambusia affinis*, *Liza abu*; localization in fish: fine, subscale; locality: Mazreeh canals; description: thin-walled metacercaria, oval cyst, ventral sucker armed with ventral crescentic group of 11-14 long spines, long spine 14.1  $\mu\text{m}$  and smallest spine 7.5  $\mu\text{m}$ , relatively short prepharynx and long pharynx.

*Stellantchasmus falcatus* (Onjiet Nishio, 1916) (Fig. 3). Host: *Liza abu*, *Gambusia affinis*, *Cyprinus carpio*; localization in fish: fine, subscale; Locality: Mazreeh canals; Description: Metacercariae body surface covered with numerous spines and ventral sucker armed with minute spine encircling mouth. Explusor elongated and situated behind ventral sucker.

## DISCUSSION

The study of fishes of Mazreeh district in Khuzestan province has shown a high rate of infection (44%) with metacercariae of medically important flukes (Heterophyidae); which explains why human infection is not uncommon 1.9%, (4). The recent paper of Scholz presents similar flukes from Laos (6). Therefore the fauna of fish Heterophyids in that area is the same as Iran. Since local people consume inadequately cooked fish which harbour the metacercariae of these parasites (1), heterophyidosis is an endemic disease of man in the area. Most cases of human heterophyidosis are preventable by taking measures such as freezing the fish 30 hours before consumption (7). The drugs which are used for the treatment of human are praziquantel and niclosamide in 20 mg/kg and 2 g/kg in single dose respectively (8).

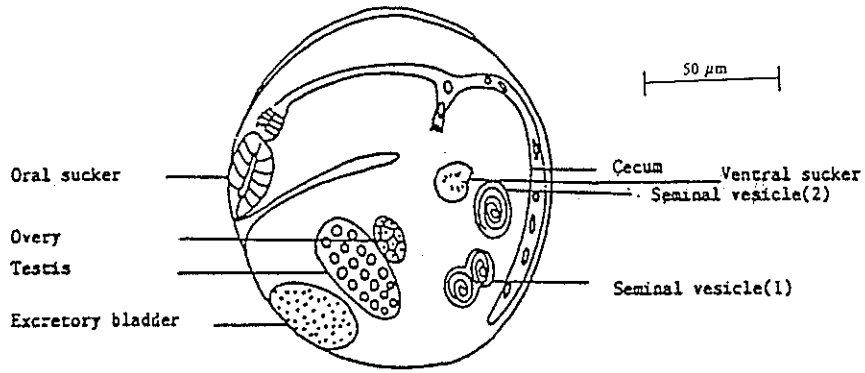


Fig 1. *Haplorchis pumilio* (Encysted metacercaria)

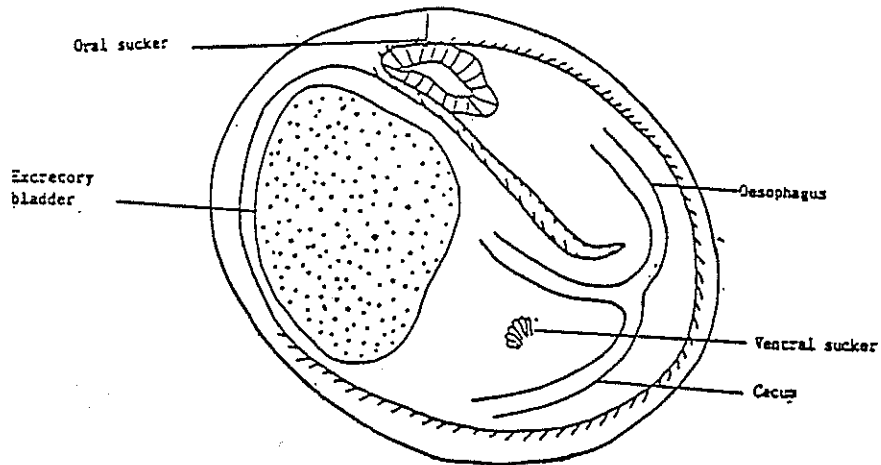


Fig 2. *Haplorchis taichui* (Encysted metacercaria)

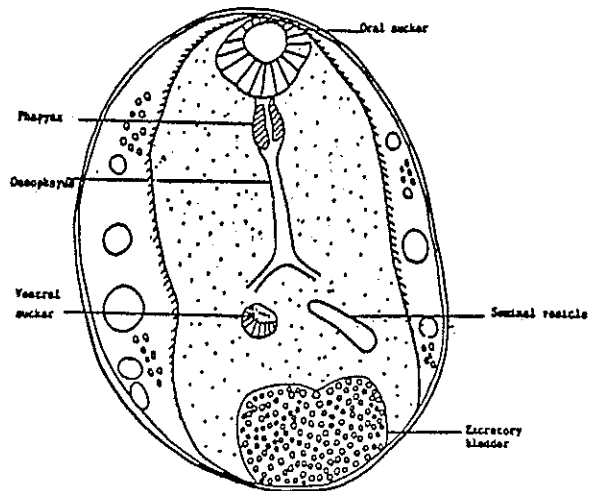


Fig 3. *Stellantchasmus falcatus* (Encysted metacercaria)

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