

METACERCARIAE ISOLATED FROM CYPRINOID FISHES IN KHON KAEN DISTRICT BY DIGESTION TECHNIC

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Abstract. Several kinds of fresh-water fishes collected from natural water resources in Khon Kaen District were digested with 0.25 % pepsin A to obtain the infective stage or metacercariae of fish-borne trematodes. Most of them harbored at least 3 species of trematodes. Two families of medical trematodes, *ie*, Family heterophyidae and Family Opisthorchiidae, were isolated. The heterophyid flukes consisted of *Haplorchis taichui*, *H. pumilio* and *Centrocestus formosanus*. *Opisthorchis viverrini* was the only parasite of the Family Opisthorchiidae found in these fish. Among these four species, *H. taichui* was predominant and found in all kinds of fish examined, especially *Hampala dispar*.

INTRODUCTION

It has been know that fish are not only the main source of protein for certain populations but also the intermediate hosts of many kinds of parasites. Fresh-water fish, especially cyprinoids, are important intermediate hosts of flukes which parasitize animals and humans. Several species of metacercariae of medically important flukes were reported from Japan (Komiya and Suzuki, 1966), Vientiane Province, Lao PDR (Ditrich *et al*, 1990; Scholz *et al*, 1990; Scholz, 1991; Giboda *et al*, 1991). In Thailand, fishborne trematodes, especially the liver fluke, *Opisthorchis viverrini*, and minute intestinal flukes of the Family Heterophyidae were commonly found in the northeastern region including Khon Kaen Province where villagers enjoy eating insufficiently cooked or raw freshwater fish. To collect and identify the metacercariae of fish-borne trematodes this experiment was undertaken.

MATERIALS AND METHODS

Fishes were collected from the natural water resources in Khon Kaen District, They were grouped and identified. To obtain the metacercariae, the whole fish was minced and artificially digested with 0.25% pepsin A in 0.85% NaCl and 1.5% HCl for 1-2 hours at 37 °C in a shaking water bath. The digested material was passed through graded sieves to separate large particles, sedimented in 0.85% NaCl then examined

for metacercariae under a stereoscopic microscope. The identification of the metacercariae was made by morphological examination based on the reports of several investigators (Pearson and Ow-Yang, 1982; Scholz *et al*, 1990; Scholz, 1991; Giboda *et al*, 1991). It was confirmed by studying the morphology of adult worms developed in hamsters fed by those metacercariae.

RESULTS

Several kinds of fish were collected in Khon Kaen District, Those normally eaten by man are *Mystacoleucus atridorsalis*, *Cyclocheilichthyes armatus*, *Puntius* spp, *Hampala dispar* and *Cirrhinus julleine*. Among them, *M. atridorsalis* and *C. julleine* were the most and the least abundant respectively.

Various types of metacercariae were isolated from these fish. Only those which can infect humans were identified and recorded in this observation. It was found that at least 4 species of 2 families of medical trematodes were isolated. They consisted of 3 species of Family Heterophyidae, *ie* *Haplorchis taichui* (Ht), *H. pumilio* (HP) and *Centrocestus formosanus* (Cf) and one species of Family Opisthorchiidae, *ie* *O. viverrini* (Ov). The appearance of these metacercariae are shown in Figs 1, 2, 3 and 4 respectively. The qualitative examination of parasites found in each kind of fish was recorded in Table 1.

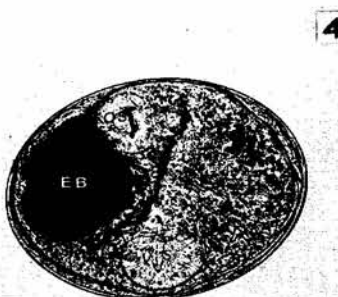
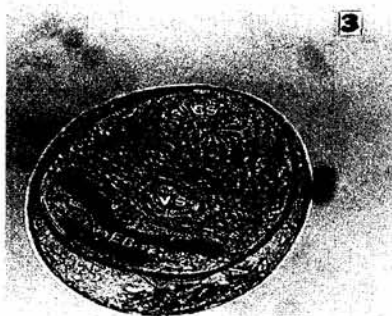
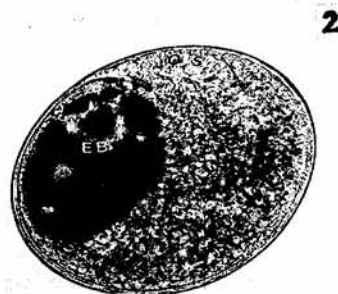
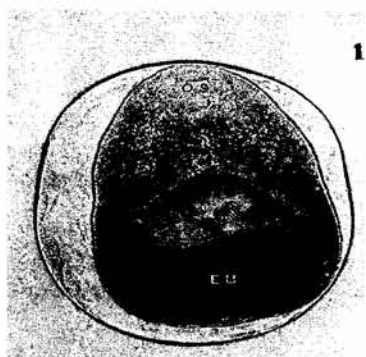
Table 1

Parasites found in fish examined.

Fish (number examined)	Metacercariae			
	Ht	Hp	Cf	Ov
<i>Hampala dispar</i> (7)	++++	+	+	-
<i>Puntius gonionotus</i> (228)	+++	+	+	-
<i>Puntius leiacanthus</i> (10)	+++	+	+	+
<i>Cyclocheilichthyes armatus</i> (221)	++	+	+	+
<i>Mystacoleucus atridorsalis</i> (763)	++	+	+	+
<i>Cirrhinus julleine</i> (3)	++	+	-	+

It was observed that *H.taichui* was predominant compared to other species found in each kind of fish. A large number of metacercariae, as many as 500 cysts, were isolated from one *Hampala dispar*. *H. pumilio* was also found in every kind of fish examined but the number of the cysts was much lower than for *H. taichui*. In contrast, *O. viverrini* and *C. formosanus* were found in a very small number in some fish.

Among the fish examined, *Puntius leiacanthus*, *Cyclocheilichthyes armatus* and *Mystacoleucus atridorsalis* were found to harbor more species of parasites than *Hampala dispar* or *Cirrhinus julleine* or *P. gonionotus*.



The appearance of metacercariae

CS = circumoral spines; EB = excretory bladder; OS = oral sucker; S= sclerites on ventral; VS = ventral sucker.

Fig 1 - *Haplorchis taichui*.Fig 3 - *Centrocestus formosanus*.Fig 2 - *H. pumilio*.Fig 4 - *Opisthorchis viverrini*.

DISCUSSION

It has been known that *Opisthorchis viverrini* is the most common fish-borne trematode in northeastern Thailand. A large number of metacercariae were isolated from fish collected in Chonnabot District, Khon Kaen Province (Komalamisra and Setasubun, 1989). They found a very small number of *H. taichui* metacercariae in *Cirrhinus julleine* only. The findings reported here were contrary to the previous report suggesting that the distribution of parasites varies from time to time and from place to place. The parasites show a very low host specificity because one species can live in several kinds of fish, eg, *H. taichui*. The presence of parasites in the host also varies from species to species. This may be due to the susceptibility of the host, the number of parasites and hosts, the depth of water as well as the size and environment of the water reservoir. Therefore, the investigation of parasites in a certain place cannot be used as a source of information to conclude the situation of parasites in some other places even in the same province.

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