

# A SURVEY OF HELMINTHS IN FRESHWATER ANIMALS FROM SOME AREAS IN CHIANG MAI

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**Abstract.** Thirteen freshwater animals consisting of 8 species of fish, 1 species of shrimps and crabs and 3 species of mollusks collected during September 2000 from 8 sites in 4 districts of Chiang Mai Province: Hang Dong, San Pa Tong, Chom Tong and Hot were investigated for helminths. Two metacercariae were recovered from 4 species of fish with the prevalence of 80.32%; Metacercariae of *Stellantchasmus falcatus* were found in the body cavity and under the scales of *Dermogenus pusillus* (39.34%) and the metacercariae of *Haplorchoides* sp were found only under the scales of *Mystacoleucus marginatus*, *Systomus orphoides* and *Rasbora paviei*, (40.98%). Adult of Acanthocephala, *Pallisentis* sp also recovered from the intestine of *Trichopsis vittatus* (3.29%). Moreover, Pleurolophocercous cercaria and redia were found in mollusk (*Lymnaea* sp) with the prevalence of 45.65%.

## INTRODUCTION

It is well known that freshwater fishes and gastropods are not only a major protein source for human growth but also are common intermediate hosts of many kinds of trematode parasites such as small intestinal flukes (Heterophyidae), liver flukes and even lung flukes (Yamaguti, 1958; Pearson, 1964; Ditrich *et al*, 1990). A number of the helminthic infection in rats, cats, dogs and even in humans have been reported over a wide range of areas in Thailand, especially in northern and northeastern regions (Eusaeng, 1970; Kliks and Tantachamrun, 1974; Tantachamrun and Kliks, 1978; Radomyos *et al*, 1990; Wongsawad *et al*, 1996). One of the major causes of the infection is due to eating uncooked or partially cooked fish and mollusks. People who live in these regions have a high risk of the infection. In Chiang Mai, there have been several studies demonstrating the helminthic infection in fishes, house lizards and some domesticated mammals (Saehong and Wongsawad, 1997; Namue and Wongsawad, 1997; Namue *et al*, 1998; Wongsawad *et al*, 1997). The present study was done to determine the prevalence of helminthic infections in freshwater animals collected from 8 sites in 4 districts, in Chiang Mai Province during September 2000: Hang Dong, San Pa Tong, Chom Thong and Hot, and to obtain additional information that may be contribute to public health and veterinary interest.

## MATERIALS AND METHODS

Thirteen freshwater animals consisting of 8 species of fishes (61), 1 species of shrimps (10) and 1 species of crabs (24), and 3 species of mollusks (46) were

collected from 8 natural water sources in : Hang Dong, San Pa Tong, Chom Thong and Hot districts in Chiang Mai Province during September 2000. All specimens were examined for helminths. Parts of fishes: scales, fins, gill, muscles and body cavity including visceral organs, were individually examined under a stereomicroscope. The gills and body cavity, and its contents of the crabs were examined. The latter was done by squash method and then observed under the stereomicroscope. Shrimps were placed on slide and crushed to separate its shell from its muscle, then removed and placed into a Petri dish to examine for metacercariae. Mollusks were cracked with a stone and their visceral organs examined for the helminths. The encysted metacercariae were studied and identified alive together with excysted metacercariae under light microscope. The worms were removed, counted, fixed in 10% formalin and stained with Borax's carmine or hematoxylin. The species identification was based on the morphological descriptions as given by Yamaguti (1958), Pearson (1964), Kliks and Tantachamrun (1974), Pearson and Ow-Yang (1982) and Radomyos *et al* (1990).

## RESULTS

One hundred and thirty freshwater animals from 8 species of fishes, 1 species of shrimps, 1 species of crabs, and 3 species of mollusks were collected from 8 natural resources in 4 districts of Chiang Mai Province during September 2000 and examined for helminths. The results of the survey revealed 4 parasitic worms recovered from 5 species of fishes (49 fishes) and 1 species of mollusks (21 mollusks). Two metacercariae were localized in the body cavity and

under the scales of 4 species of fishes (*Dermogenus pusillus*, *Mystacoleucus marginatus*, *Systemus orphoides* and *Rasbora paviei*). The metacercariae of *Stellantchasmus falcatus* (Fig 1) were observed in the body cavity and under the scales of *D. pusillus* with the prevalence of 39.34%. The metacercariae of *Haplorchoides* sp (Fig 2) were found only under the scales of 3 fishes species : *M. marginatus*, *S. orphoides* and *R. paviei*, with the prevalence of 40.98%. Furthermore, adult Acanthocephala; *Pallisentis* sp (Fig 3) was recovered from the intestine of *Trichopsis vittatus*; a 3.29% prevalence. Among the 3 species examined, 21 out of 46 mollusks belonging to *Lymnaea* sp, were infected with pleurolophocercous cercaria and redia (45.65%). A summary of freshwater species, number examined, number infected and the prevalence of helminthic infection was shown in Table 1.

DISCUSSIONS

As shown by the results, the metacercarial infection of freshwater fishes is commonly found in Chiang Mai. Nearly a half of *D. pusillus* was infected with *S. falcatus* (39.34%). This might be due to a small number of specimen collection. However, previous reports showed that *S. falcatus*, both metacercariae and adult, were found in human ileum autopsy (Tantachamrun and Kliks, 1978) and in other mammals such as rats, cats, dogs, and chickens (Kliks and Tantachamrun, 1974; Radomyos *et al*, 1990; Wongsawad *et al*, 1997). This finding implied that *S. falcatus* may be transmitted to humans who eat uncooked or partially cooked fishes. On the other hand, in some freshwater fishes: *M. marginatus*, *S. orphoides* and *R. paviei*, were also infected with *Haplorchoides* (40.98%). Recently, Namue *et al* (1998) reported that metacercariae of two heterophyids; *Haplorchis* and *Haplorchoides*, had a high prevalence of infection in cyprinoid fishes collected from natural habitats in Chiang Mai and Lumphun Provinces. Obviously, this metacercaria was commonly found together with *Haplorchis* metacercariae. Both minute heterophyid metacercariae are found together under the scales. Morphologically, both metacercariae have a similar shape but *Haplorchoides* is slightly larger. *Haplorchoides* were not only found under the scales but they were also localized in visceral organs *ie* intestinal walls. In this case, *Haplorchoides* cysts were easily distinguished from *Haplorchis* cysts. Pande and Shukla (1976) reported 3 species of *Haplorchoides* and recorded the metacercariae from fins, muscles, eye muscles and gills of 12 species of freshwater fishes, mainly from the family Cyprinidae. In this

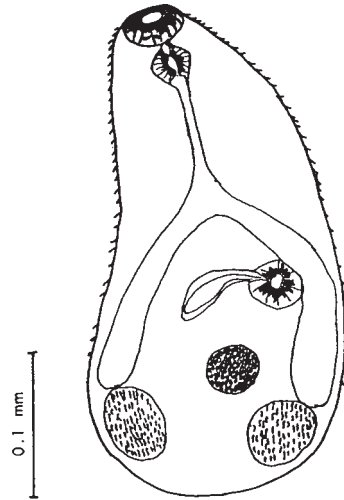


Fig 1- *S. falcatus* (excysted metacercariae).

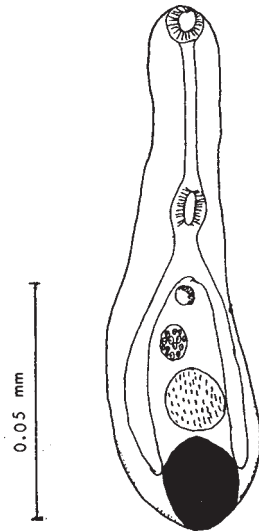


Fig 2- *Haplorchoides* sp (excysted metacercariae).

investigation, *Haplorchoides* cysts were localized only under the scales.

In this survey, adult Acanthocephala, *Pallisentis* sp was localized in the intestines of *T. vittatus*. Previously, there were several reports revealing that *Pallisentis* sp were recovered from some freshwater fishes in Thailand (Kunathai, 1969; Sangplong, 1979; Wongkham, 1982). In addition, Luadee (1996) studied the ultrastructure of *Pallisentis* sp (Acanthocephala: Quadrigyridae) in striped snake-head fish (*Ophicephalus striatus*, Bolch) by using SEM and TEM. It was found that the tegumental surface of proboscis was covered with 4 rows of hooks, each row contains

Table 1  
A summary of freshwater species, number collected, number infected, species of helminths, and the prevalence of helminthic infection.

Host	Number of host collected	Number of host infected	Infected organs	Helminths	Prevalence (%)
<i>Dermogenus pusillus</i>	24	24 (++)	body cavity & scales	Metacercariae ( <i>Stellantchasmus falcatus</i> )	100
<i>Mystacoleucus marginatus</i>	22	22 (+++)	scales	Metacercariae ( <i>Haplorchoides</i> sp)	100
<i>Systomus orphoides</i>	1	1 (++)	scales	Metacercariae ( <i>Haplorchoides</i> sp)	100
<i>Rasbora paviei</i>	2	2 (++)	scales	Metacercariae ( <i>Haplorchoides</i> sp)	100
<i>Trichopsis vittatus</i>	4	2 (5)	intestines	<i>Pallisentis</i> sp	50
<i>Lymnaea</i> sp	21	21 (+)	body cavity	Redia, Pleurolophocercous cercaria	100
<i>Homaloptera leonardi</i>	3	-	-	-	0
<i>Gambusia affinis</i>	2	-	-	-	0
<i>Sinotaia ingallsiana</i>	4	-	-	-	0
<i>Pila</i> sp	1	-	-	-	0
<i>Macrobrachium lanchesteri</i>	10	-	-	-	0
<i>Somannia-thelpusa</i> sp	24	-	-	-	0

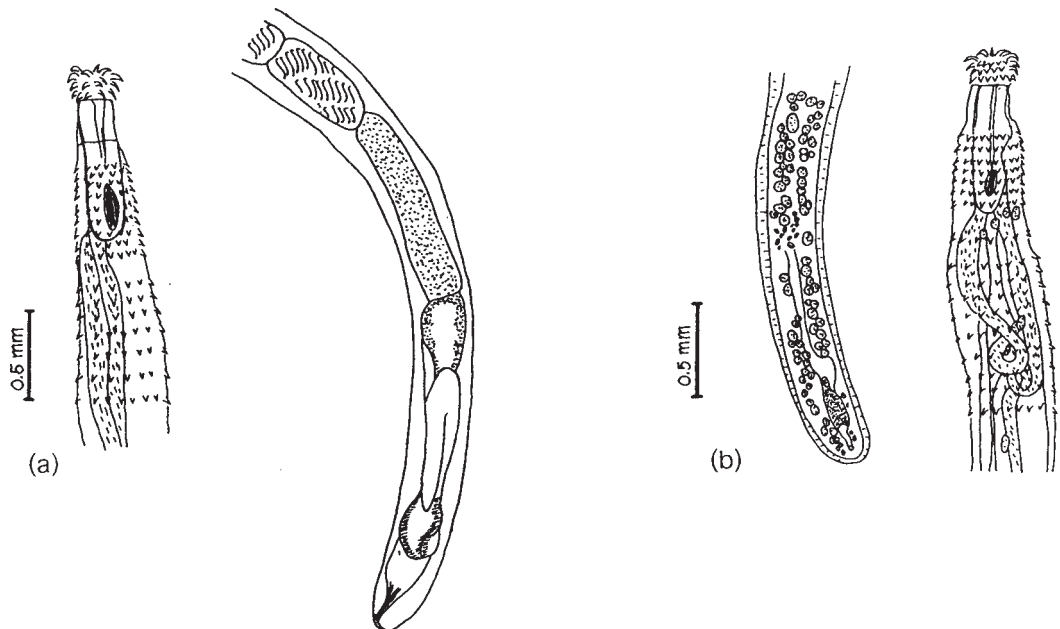


Fig 3- Adult of *Pallisentis* sp: (a) male; (b) female.

12 hooks, resembled *Pallisentis* sp that has been previously described by Yamaguti (1963). His finding, the first observation from Thailand, indicates that the worms may be *P. colisai*.

For the mollusk examination, *Lymnaea* sp were found to be infected with redia and pleurolophocercous cercaria (100%). This is not surprising, as the previous studies, it has been well known that

gastropods are the most common intermediate host of many parasitic worms.

For the heterophyid metacercaria infection, the prevalence of these intestinal flukes in fishes tends to increase because rodents and birds including some domestic animals serve as reservoir host sustaining their life cycles in nature as usually evidenced by the metacercaria-parasitized fishes. The numbers of parasite species infecting man will also increase, or new records may be recovered in the near future unless a successfully controlled program against these intestinal flukes is implemented.

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