

SURVIVAL OF *HAPLORCHIS TAICHUI* METACERCARIAE IN LAB -PLA, THAI TRADITIONAL FOOD PREPARATION

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Abstract. Lab-Pla is a famous kind of Thai traditional food in northern and northeastern Thailand. Consumption of uncooked Lab-Pla can lead to trematode infection because cyprinoid fish serve as the 2nd intermediate hosts of trematodes. The preparation of Lab-Pla can be made in different ways, depending on seasonings used in different places. The effect of the seasonings used in Lab-Pla on the survival of *Haplorchis taichui* metacercariae were, therefore, determined. The methodology was done by the following: 100 g of chopped Siamese mud carp fish (*Henicorhynchus siamensis*) were used for each experiment of seasonings used for completely mixed Lab-Pla. Mixed materials were blended and digested by 1% pepsin solution to obtain metacercariae and then checked for the movement under a stereomicroscope. The results showed that metacercariae remained active in 5 experimental groups: fermented fish treated, fish sauce treated, chili powder treated, ground roasted rice treated, and complete mixed treated indicated by average as follows: 27, 38.7, 33.3, 42.7 and 21%, respectively. In conclusion, fermented fish and completely mixed methods have more effectiveness in killing metacercariae in Lab-Pla preparation than other seasonings ($p < 0.05$).

INTRODUCTION

Helminthiasis is still the most important clinical and public health problem in developing countries throughout the world (WHO, 1995). This problem is directly related to sanitary health and the economic status of populations. The main factors that cause a high degree of infection are: people have inadequate knowledge about public health and sanitary management, geographic climatic features and traditional food consumption (Radomyos *et al.*, 1998; Sukontason *et al.*, 2001). In Thailand, consumption of raw or partially cooked food is widely found (especially in northern and northeastern regions) which causes people to be infected with several kinds of trematodes (Pungpuk *et al.*, 1998; Sukontason *et al.*, 1998). *Haplorchis taichui* is one of the heterophyid flukes reported in humans in northern Thailand after eating Siamese mud carp, (*Henicorhynchus siamensis*), the important 2nd intermediate host (Radomyos *et al.*, 1998; Wongsawad *et al.*, 2000; Waikagul, 1991). This fish is famously used in several kinds of traditional food, such as Koi-Pla and Lab-Pla. Additionally, former reports showed that metacercariae were killed by recipes or seasonings used in traditional food preparation (Keittivuti *et al.*, 1986; Prawang, 2001; Kawin and Wongsawad, 2003). The main purpose of this study was to determine the effect of such seasonings on survival of *H. taichui* metacercariae in Lab-Pla preparation.

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MATERIALS AND METHODS

Siamese mud carp fish were collected from Mae-Ngud Somboonchol Dam, Mae Taeng district, Chiang Mai Province. Fish were chopped and divided into 6 experimental groups. First was the control group and the 5 remaining groups were treated with seasonings. One hundred grams of chopped fish was used for each experiment (both control and seasonings) as follows: fermented fish treated (3% w/v, 150 ml), fish sauce treated (10 ml), chili powder treated (3 g), ground roasted rice treated (4 g) and completely mixed Lab-Pla. Mixed materials were blended and digested using 1% pepsin solution. Then, they were incubated for 2 hours and passed through a sieve tube chamber to obtain metacercariae and check for their movement under a stereomicroscope. Conditions used to document survival of metacercariae were: movement observed at least once within 3 minutes, referred to active status and non-active status.

RESULTS

The results showed that metacercariae remained active in all 5 treated groups: fermented fish treated, fish sauce treated, chili powder treated, ground roasted rice treated and completely mixed treated indicated by an average of 27.0, 38.7, 33.3, 42.7 and 21.0% respectively (Table 1). The control group showed 100% remaining active metacercariae. From these results, it was found that each seasoning has different effects on the survival of *H. taichui* metacercariae. Fermented fish and completely mixed ones have more effectiveness in killing metacercariae in Lab-Pla preparation than other seasonings ($p < 0.05$). It was

Table 1

The percentage of metacercariae remained active in each experimental groups by average.

Experimental group	% metacercariae remained active
Control	100.0
Fermented fish	27.0 ^a
Fish sauce	38.7 ^{bc}
Chili powder	33.3 ^{ab}
Ground roasted rice	42.7 ^c
Completely mixed	21.0 ^a

a, b and c showed significantly differences with 95% confidence ($p<0.05$).

interesting that chili powder has nearly the same effect as fermented fish ($p>0.05$) on the survival of metacercaria (Table 1).

DISCUSSION

This study showed that all seasonings used in Lab-Pla preparation could affect the survival of *H. taichui* metacercaria but there were differences. Chili powder had nearly the same effect as fermented fish ($p>0.05$) on the survival of metacercaria (Table 1). This may be due to capsaicin, an alkaloid with burning taste in chili which should be studied further. Fermented fish and completely mixed ones had more effectiveness in killing metacercariae than other seasonings with statistical significance ($p<0.05$). The high concentration of sodium chloride in fermented fish may affect the absorptive capacity of the metacercarial membrane by increasing osmotic potential between the outer and inner cyst wall. However, the fish sauce treated group showed no marked effects because the amount used in this study was so small. Completely mixed showed severe effects on survival of metacercariae due to several seasonings added and depended on the incubating period after mixing. Phenomena found in this study agreed with previous reports that metacercariae were completely killed by 20% concentration of sodium chloride (Kawin Wongsawad, 2003) and after traditional seasoning for 24 hours (Keittivuti *et al.*, 1986). Many kinds of seasonings or recipes in traditional food preparation can kill metacercariae, but time is required to kill them all. Food should be thoroughly cooked and cleaned to prevent parasitic infection because more time is necessary to kill metacercariae.

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