

SPARGANA INFECTION OF FROGS IN MALAYSIA

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Abstract. Frogs caught from two States (Selangor and Langkawi) in Malaysia were examined for spargana of *Spirometra* sp. Infected frogs usually show no marks of infection but some had swelling and bleeding at the infection site. The size and weight of the infected frogs did not correlate with the infection status. The infection status in relation to human health is discussed.

INTRODUCTION

The life-cycle of *Spirometra* sp (Cestode) consists of 2 intermediate hosts, the first intermediate host is the *Cyclops* sp (Cyclopidae) and the second intermediate hosts are frogs, snakes or any warm or cold blooded vertebrates. Tropical and oriental forms occur in frogs (Bonne, 1942; Huang and Kirk, 1962) and spargana from frogs are usually 1-3 cm in length (Corcum, 1966) whereas those from reptiles/mammals often exceed a length of 20 cm. Faust (1928) found heavy spargana infections in frogs, snakes and several species of mammals from representative areas in North, Central and South China. This paper reports the infection status and their effects in frogs found in two States (Selangor and Langkawi) in Malaysia.

MATERIALS AND METHODS

Frogs were collected from paddy fields and swampy areas in Selangor and Langkawi manually or with nets. They were killed in chloroform and weighed. The flesh were torn apart for the detection of spargana. The spargana found were measured and infection marks were noted.

RESULTS

Rana cancrivora was the most heavily infected species (21.5%) followed by *Rana limnocharis* (8.8%) (Table 1). From 112 infected frogs collected, it was found that 42.9% showed no marks of infection, 36.6% showed bleeding and swelling and

20.5% showed swelling at the infection sites. The weight of frogs did not correlate with the infection status; smaller frogs (10 g or less) had a higher infection rate compared to larger frogs (101-110 g) (Table 2). Spargana were usually found in the hind

Table 1

Numbers of frogs collected and their infection rate.

| Species | No. of frogs collected | No. of % infected frogs | % of infected species |
|-----------------------|------------------------|-------------------------|-----------------------|
| <i>R. cancrivora</i> | 205 | 44 | 21.5 |
| <i>R. limnocharis</i> | 660 | 58 | 8.8 |
| Unknown species | 83 | 10 | 12.0 |
| Total | 948 | 112 | 11.8 |

Table 2

Number of infected frogs in relation to with body weight (g).

| Body weight (g) | No. of infected frogs examined |
|-----------------|--------------------------------|
| ~ 10 | 52 |
| 11 ~ 20 | 23 |
| 21 ~ 30 | 13 |
| 31 ~ 40 | 10 |
| 41 ~ 50 | 6 |
| 51 ~ 60 | 1 |
| 61 ~ 70 | 3 |
| 71 ~ 80 | 1 |
| 81 ~ 90 | - |
| 91 ~ 100 | 2 |
| 101 ~ 110 | 1 |
| Total | 112 |

legs (femur muscles) (67.6%) followed by the abdomen (16.2%) and front legs (9.9%) (Table 3). The length of spargana found in frogs is from 0.3 - 13.0 cm.

Table 3
Site of infection in frogs and percentage of infected frogs.

| Site of infection in frogs | No. of infected frogs | Total no. of worms found from infected frogs | Percentage of infected frogs |
|----------------------------------|-----------------------|--|------------------------------|
| Hind legs | 76 | 203 | 67.6% |
| Abdomen | 18 | 187 | 16.2% |
| Front legs | 11 | 17 | 9.9% |
| Hind legs + abdomen + front legs | 1 | 52 | 0.9% |
| The whole body | 6 | 200 | 5.4% |
| Total | 112 | | |

DISCUSSION

From this study, we found that *Rana cancrivora* has the highest infection rate and unfortunately it is the main species sold in local market for human consumption. With frog flesh being a delicacy for most of the Chinese community in Malaysia, there is a possibility of human infection with *Spirometra* sp in this country. Furthermore, 42.9% of infected frogs showed no marks of infection. Smaller frogs are cheaper and have a heavier infection load. Frog meat is frequently cooked by stir frying which may not be effective in killing the spargana. Moreover, from this study we also found that the commonest site where spargana were found is the hind legs (67.6%) and this seems to be the main part eaten.

Man is an accidental intermediate host and becomes infected by three possible routes (Tansurat, 1966), these being through drinking water containing infected cyclops, ingestion of raw or partially cooked frog flesh containing spargana, and through the practice of application of a poultice (frog's flesh) on an open wounds or sore eyes, common in China, Vietnam and in some rural areas in Thailand.

In Indonesia, according to Macfarlane (1960), tadpoles are eaten as a delicacy. They become

readily infested as opposed to adult frogs and the disease may be spread in this way to man.

In Korea, Weinstein *et al* (1954) found that most humans are infected by eating snake meat containing spargana. Whether the snakes became infected directly from *Cyclops*, or by eating frogs or tadpoles containing spargana is unknown as both methods are possible.

So far there has not been a reported case of human infection of *Spirometra* sp in Malaysia but the possibility of human acquired infection through eating partially cooked frog flesh is present, thus further studies should be done to determine the infection status in Malaysia.

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