

## RESEARCH NOTE

### CONTROL OF *OPISTHORCHIS VIVERRINI* CERCARIAE USING THE COPEPOD *MESOCYCLOPS LEUCKARTI*

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Opisthorchiasis viverrini is one of the major food-borne parasitic diseases of public health importance in Thailand (Sadun, 1955; Harinasuta and Vajrasthira, 1960; Wykoff *et al.*, 1965). It has been estimated that approximately 7 million of the population harbor this liver fluke with the highest rate being in northeastern provinces where raw or insufficiently cooked fresh water fish is a favorite dish of the local people (Preuksaraj, 1984). Effective measures of controlling this parasite infection include mass treatment of the positive cases, health education to stop the habit of eating raw fish and construction and use of latrines. However, it is very difficult to change these habits of people in northeastern Thailand. Control of *Bithynia* snails and cyprinoid fish, the first and second intermediate hosts of this fluke, is not considered an available approach since these measures are expensive and not practical; moreover, fish are perceived by the people as an important staple food and their main source of protein.

Copepods are very effective wherever they occur because they feed primarily upon ciliated protozoa (Marten, 1984). The copepod has also been widely reported as a biological control agent

for mosquito larvae (Bonnett and Mukaida, 1957; Marten, 1984; Riviere *et al.*, 1987). However, the potential of the copepod as a predator of *Opisthorchis viverrini* cercariae is still unknown. Here we briefly report an investigation of a new biological control for *O. viverrini* cercariae shed by *Bithynia* snails using the copepod *Mesocyclops leuckarti*.

Initially fresh water copepods were collected from the ponds in Khon Kaen Province. The copepod *M. leuckarti* was selected for breeding in the laboratory. *O. viverrini* cercariae were obtained from photo-exposition of naturally-infected *Bithynia goniomphalos*, which were also collected from Khon Kaen Province. One copepod and 20 cercariae were introduced into each well of a 24-well tissue culture plate (Nunc, Denmark) with a final volume of 3 ml of dechlorinated water per well. The experiment was conducted in duplicate plates. Each well of the control plate contained 20 cercariae only. Each copepod preying on cercariae was observed and the remaining surviving cercariae were counted at 0.5, 1, 3, 6, 12, 18, and 24 hours respectively. The mean percentage of surviving cercariae in 24 wells at each counting was deter-

Table 1  
Average percentage of surviving *O. viverrini* cercariae at various times.

Plate no.	Examined period (hours)							
	0	0.5	1	3	6	12	18	24
I	100	59	42	27	12.5	1.1	0.5	0
II	100	65	62	33	20	13	2.5	0
Control	100	99	99	99	99	95	83	70

mined. The results of the experiment are shown in Table 1.

Both experimental plates showed similar results, as the *O. viverrini* cercariae were ingested by the copepod *M. leuckarti*. The percentage of surviving cercariae decreased when times of exposure were prolonged. A total of 20 *O. viverrini* cercariae were ingested by each copepod within 24 hours. Seventy per cent of surviving cercariae in the control plate were observed 24 hours after. These findings thus show promise of a possible way to control *O. viverrini* infection by preventing infection of cyprinoid fish by cercariae shed by *Bithynia* snails.

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