

Studies of New Experimental Intermediate and Paratenic Hosts  
and Modes of Transmission of *Gnathostoma spinigerum*

Principal Investigator : Professor Svasti Daengsvang, Med. D.

Associate Investigators : Paisarl Yingyoud, B.Sc.  
Rapee Machimasatha, B.Sc.  
Thipchuta Dharmasarithul, B.Sc.

**OBJECTIVE:** To attempt to identify new experimental host animals susceptible to *Gnathostoma spinigerum* as reported in the SEATO Medical Laboratory Annual Report April 1972 to March 1973.

**BACKGROUND:** Some species of crustacean, namely fresh water crabs, shrimps and prawns, are occasionally eaten raw or insufficiently cooked by man. Experimentally it has been shown that fresh water crabs (*Paratelphusa sexpunctatum* and *Potamon smithanus*) could be infected with *G. spinigerum* advanced third stage larvae; therefore, they may be considered as a potential source of natural infection to man (1). After experimentally feeding shrimps and prawns (*Macrobrachium rosebergi* De Mann, and *M. mirabile* Kemp) with gnathostome larvae, it appeared that they could not be infected; however, only a few shrimps and prawns were utilized in the study (2). This study was expanded to include all larval stages of *G. spinigerum* and larger numbers of shrimps and prawns.

**DESCRIPTION:** In addition to the prawns obtained from sources appearing in the above report, six more living adult prawns (*M. rosebergi*) were obtained from a restaurant in Pathum Thani near Bangkok. These prawns were caught from the Chao Phya River a few kilometers north of Bangkok. Before initiating this study the prawns were maintained in fresh-water aquaria for four to five weeks for acclimation

Table 1. Results of Feeding *Gnathostoma spinigerum* larvae to Fresh-water Shrimp and Prawn.

Method of Feeding	Recipients		No. Larvae Used			Remarks
	Shrimp	Prawn	Newly Hatched or First Stage	Fully Developed in Cyclops	Advanced Third-stage from Mice	
Natural	100	—	20000	—	—	Autopsies negative after 1-35 days
Natural	100	—	—	1000	—	Autopsies negative after 1-81 days
Artificial	—	3	—	250	—	Autopsies negative after 31 and 57 days
Natural	—	8	—	—	215	Autopsies negative after 4-42 days
Artificial	—	5	—	—	48	Autopsies negative after 10-30 days
None	100	12	—	—	—	Control—autopsies negative

to the laboratory environment. From a total of 28 adult prawns obtained from the experimental farm of the Department of Fisheries and those from the Pathum Thani restaurant, 12 were autopsied for the presence of gnathostomes. The remaining 16 were experimentally fed with varying numbers of larvae fully developed in cyclops, and also advanced third-stage larvae from infected mice.

Two methods were used for feeding gnathostome larvae to prawns. Natural feeding was accomplished by presenting the prawns with both cyclops and minced mouse tissue containing known numbers of infective larvae. After feeding, the prawns were observed visually every one to two hours until all cyclops and mouse tissue were consumed. This usually occurred in less than six hours. Artificial feeding was performed by use of a polyethylene tube attached to a needle and a 1.0 ml syringe containing a known number of larvae in a few drops of fresh water. The tube was easily inserted into the mouth of the prawns and the larvae were injected. Autopsies were performed from 4 to 57 days after feeding.

Shrimp proved to be too small for successful artificial feeding; therefore, only natural feeding was used.

**PROGRESS:** A review of the experimental feeding of *G. spinigerum* larvae to fresh water shrimps and prawns is presented in Table 1.

**SUMMARY:** Fresh water shrimps and prawns (*Macrobrachium rosebergi*, De Mann) were not infected by feeding on larvae of *G. spinigerum*. The evidence does not indicate that these crustaceans can act as intermediate or paratenic hosts for *G. spinigerum*.

#### REFERENCES:

1. Daengsvang, S., Sirichakwal, P., Yingyourd, P. and Machimasatha, R.: SEATO Medical Research Laboratory Annual Report, April 1971.
2. Daengsvang, S., Yingyourd, P. and Machimasatha, R.: SEATO Medical Research Laboratory Annual Report, April 1972.