

Studies of New Experimental Hosts, Life Cycles and Modes of Transmission of Gnathostomes

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OBJECTIVE: To locate new experimental host animals susceptible to Gnathostoma spinigerum, G. hispidum, and G. doloresi and to determine the life cycle of G. vietnamicum.

DESCRIPTION: Fresh water crabs were tested as possible intermediate hosts of G. spinigerum in feeding experiments using infected cyclops for some and third-stage larvae from laboratory mice for others. A Macaca irus fed larvae of G. spinigerum nearly 4 years previously was examined for infection. Laboratory determinations for paratenic hosts of G. hispidum continued.

PROGRESS: The results of experimental feeding of fully developed Gnathostoma spinigerum larvae in cyclops and advanced third-stage larvae from experimental mice to fresh water crabs were as follows:

Number of crabs	Larvae fed and source	Autopsy results
3 <u>Potamon smithanus</u>	22-43 Larvae in cyclops	Neg. at 2-25 days.
3 <u>Paratelphusa sexpunctatum</u>		
1 <u>P. smithanus</u>	7-30 Larvae from mice	Neg. at 3-34 days.
7 <u>P. sexpunctatum</u>		
1 <u>P. sexpunctatum</u>	3 Larvae from mice	Pos. 1 living, 1 dead at 1 1/2 hours.
2 <u>P. smithanus</u>	8 Larvae from mice	Pos. 6 living at 38 days.
2 <u>P. sexpunctatum</u>		
1 <u>P. sexpunctatum</u>	50 (2 feedings) from mice	Pos. 16 living at 34 days.
1 <u>P. smithanus</u>	None (controls)	Negative.
6 <u>P. sexpunctatum</u>		

It is concluded that fresh water crabs can act as a source of infection for G. spinigerum.

The monkey examined 1112 days after receiving one feeding of 17 G. spinigerum larvae yielded 5 encysted living larvae in the muscles.

The larvae measured 5.0×0.5-0.6 mm which is slightly larger than those found in other paratenic hosts. The feeding of G. hispidum larvae in cyclops to a variety of animals showed that snake headed fishes, fighting fishes, a common small fresh water fish (Trichogaster trichopterus) and toads could be so infected, but that 3 catfish and a giant lizard were not susceptible during this particular series of experiments. The list of susceptible animal hosts for the larval stages of this gnathostome has been broadened to include the following:

Snake headed fish (Ophicephalus striatus and O. gachua)
 Cat fish (Clarias batrachus)
 Fighting fish (Trichopsis vittatus)
 Toads (Bufo melanostictus)
 Frogs (Rana rugulosa)
 Pra kadi (Trichogaster trichopterus)
 White mice (Mus musculus musculus)
 White rats (Rattus norvegicus var. albinus)
 Roof rats (Rattus rattus)
 Polynesian rats (Rattus exulans)
 Tree shrew (Tupaia glis)

The third-stage larvae of G. hispidum obtained from white mice and a toad were found to survive feeding a second time to mice, thus establishing the mouse as a suitable paratenic host. Fish, amphibians, and mammals have thus been found to serve as transmitting hosts for this parasite. The studies on G. doloresi and G. vietnamicum were without progress during the reporting period.

SUMMARY: Fresh water crabs were successfully infected with third stage larvae of G. spinigerum, but not with larvae from cyclops. Larvae of this species were found to survive at least 1112 days in a monkey. The list of intermediate hosts for G. hispidum was broadened to include white mice and toads as paratenic hosts. Amphibia, fishes and mammals now are known to harbor this larval parasite.

REFERENCES:

1. Csokor, J.: Gnathostoma hispidum SUISS. Cheiracanthus Diesing. Oester. Vtljschr. Wissensch. Veterinark. (in German) 57: 1, 1882.
2. Dissamarn, R., et al: Studies on Morphology and Life History of G. doloresi and G. hispidum in Thailand. J. Thai Vet. Med. Ass. 17: 1, 1966.
3. Daengsvang, S., Thienprasitthi, P., and Chomcherngpat, P.: Further Investigation on Natural and Experimental Hosts of Larvae of Gnathostoma spinigerum in Thailand. Am. J. Trop. Med. Hyg. 15: 727, 1966.
4. Golovin, O. V.: Biology of the Nematode Gnathostoma hispidum. Doklady, Akad. Nauk. S.S.S.R. 1956 III (1) 242 (in Russian) and Helminthological Abstracts. 25: 265, 1956.
5. Hoa, Le-Van: A New Gnathostome G. vietnamicum s. sp. from an Otter, Lutra elioti, in Vietnam. Bull. Soc. Pathol. (French text—English Summary), 58: 228, 1965.
6. Miyazaki, J.: On the Genus Gnathostoma and Human Gnathostomiasis, with Special Reference to Japan. Exp. Parasit. 9: 338, 1960.
7. Miyazaki, J. and Kawashima, K.: On the Larval Gnathostoma doloresi Tubangui Found in a Snake from Ishigaki—Ijima, the Ryukyu Islands (Nematoda: Gnathostomidae) Kysh J. Med. Sci., 13: 165, 1962.