

FURTHER STUDIES ON DIPHYLLOBOTHRIMUM CORDICEPS  
IN YELLOWSTONE LAKE

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Objectives

The California gull Larus californicus, has been reported as a host for Diphyllbothrium cordiceps from cutthroat trout, Salmo clarki, (Post, 1971). A comparison of development and of morphological forms of D. cordiceps in young gulls and hamsters which had previously been proven to be susceptible to infection was considered desirable.

Previous experimental exposures of cutthroat trout and grayling, Thymallus arcticus, to plerocercoids naturally infected from cutthroat trout had given mixed results with transfer of plerocercoids from cutthroat to cutthroat but not from cutthroat to grayling (Kingston et al., 1980) though grayling have been cited as a natural host for the tapeworm (Post, 1971). Work in 1980 was directed towards the elucidation of these aspects of the life cycle of D. cordiceps.

Methods

Twelve young, downy California gulls collected in June from Bamforth Lake, Albany County, Wyoming were housed in the laboratory. Seven young Syrian hamsters were also utilized in the experiments. Cutthroat trout were collected using an extendable collecting device equipped with a rotary accessory from Yellowstone Lake and transported to Laramie on ice where they were filleted and eviscerated for the recovery of flesh, body cavity, and cystic plerocercoids of D. cordiceps. Hatchery reared Colorado cutthroat trout were maintained in aquaria until utilized. Worms were administered to all putative hosts by stomach tube.

Results and Discussion

The numbers of tapeworms administered, the numbers of the various hosts exposed and the results of those exposures are presented in Table 1. Gulls, inexplicably were not susceptible to infection with D. cordiceps under a laboratory regime while some hamsters fed identical material from the same source became infected. In gulls, a high protein diet may

Table 1. Infection susceptability of Californis Gulls, Syrian Hamsters and Colorado Cutthroat to Diphyllobothrium cordiceps in a laboratory regime.

n	No. Worms Fed	Days Interval To Necropsy	Results
<b>California Gull</b>			
2	4	4	Negative
2	4	12	Negative
2	3	8	Negative
1	3	11	Negative
2	0	13	Negative
<b>Syrian Hamster</b>			
2	4 (large)	4 <sup>a</sup>	2 worms recovered
1	3 (large)	8	Negative
1	3 (large)	19	1 worm in ileum
3	4 (small cysts)	8-9	Negative
<b>Colorado Cutthroat</b>			
1	5	52	2 worms in viscera, unencysted
1	4	- <sup>b</sup>	
1	5	- <sup>b</sup>	
1	6	85	1 worm near kidney
5	6	- <sup>b</sup>	

a. 1 hamster escaped.  
 b. Data not available at report time.

be necessary for development of an infection. In fish it was possible to transfer plerocercoids from fish to fish when they are homologous species. Subspecific differences apparently are not important. With respect to the 85 day old worms recovered from the fish, they were fed to a hamster. Ten days later the hamster was necropsied and one worm was recovered. This 85-day old plerocercoid was infective to the definitive host.

#### Literature Cited

- Kingston, N., K. L. Diem and D. Mitchum. 1980. Diphylobothrium cordiceps: A Tapeworm Problem in Yellowstone Lake Fishes. New Investigations into the Life Cycle. In Proceedings of the 2nd Conference on Scientific Research in the National Parks. Vol. 2, Aquatic Biology (Scientific Conference Papers) National Park Service, Washington, D.C. 141-162.
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