

NOTES

Occurrence of the Acanthocephalan *Leptorhynchoides thecatus* in Slimy Sculpins— A New Host Record¹

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Abstract

A new host (*Cottus cognatus*) for adults of the acanthocephalan *Leptorhynchoides thecatus* (Linton) is reported. Of 176 slimy sculpins examined from eastern Lake Michigan, 93% were infected by *L. thecatus*. The number of *L. thecatus* infecting slimy sculpins was directly related to size of fish. Mean number of *L. thecatus* per fish was 17 for males, 10 for females, and 3 for immatures. One male was infected with 132 *L. thecatus*.

The life history of *Leptorhynchoides thecatus* (Linton 1891) was studied in considerable detail by DeGiusti (1949). A summary of literature concerning this species (Hoffman 1967) indicates that it inhabits the digestive tracts of many North American fish species. The intermediate host of *L. thecatus* is an amphipod (Hoffman 1967), and very commonly *Hyaella azteca* (Van Cleave 1920; DeGiusti 1949). *Leptorhynchoides thecatus* has not been previously reported to infect the slimy sculpin (*Cottus cognatus*).

Methods

Slimy sculpins (176 specimens) examined in this study were caught in 3–15-m deep trawl hauls from eastern Lake Michigan in the vicinity of the J. H. Campbell Power Plant, Port Sheldon, Michigan, from April to December 1978.

Fish were frozen immediately after collection. In the laboratory, thawed specimens were preserved in 20% formalin. All *L. thecatus* observed in both the stomach and the intestine of

sculpins were removed and counted. Parasites used for identification were taken live from slimy sculpins and placed in distilled water until the acanthocephalan's trunk was extended and the parasite was dead. The parasites were then fixed in alcohol-formalin-acetic acid solution and stained with Mayer's Paracarmine.

The nonparametric Kruskal-Wallis statistical test was used to test differences between mean densities of *L. thecatus* present in male, female, and immature slimy sculpins (Conover 1971). Although mean density of *L. thecatus* in slimy sculpins and total length of fish were correlated, the frequency distribution was nonnormal. Natural log transformation, however, produced a linear relationship between total length and density of *L. thecatus*.

Results and Discussion

Adult *L. thecatus* infected 93% of the slimy sculpins examined. More than half of the variation (coefficient of determination = 0.62) in the total number of adult *L. thecatus* infecting slimy sculpins could be explained by length of fish (Fig. 1), with larger fish exhibiting higher mean densities than smaller ones. One fish had 132 *L. thecatus*, though most had fewer than 16 worms each (Table 1). Some studies indicated that *L. thecatus* inhabit the ceca of their host (Esch et al. 1976; Vernard and Warfel 1953). However, we found no adult *L. thecatus* in the ceca of slimy sculpins, perhaps because of the small number (2–4) and size of ceca in this species. Twenty-four of the 176 sculpins examined had *L. thecatus* in the stomach; whereas, 166 had parasites in the intestine. Those parasites found in the stomach were not attached and may have been regurgitated at time of host capture. The higher mean density of adult *L. thecatus* in male compared with female slimy sculpins (Table 1) was significant at the $\alpha = 0.1$ level. It is not known why females had lower infection rates than males, but most females examined had very well developed ovaries which displaced internal organs and flattened the lumen of the intestine. This may have inhibited intestinal attachment by *L. thecatus*. Although no seasonal studies on food eaten by this species in Lake Michigan were found, it is also possible that male and female slimy sculpin

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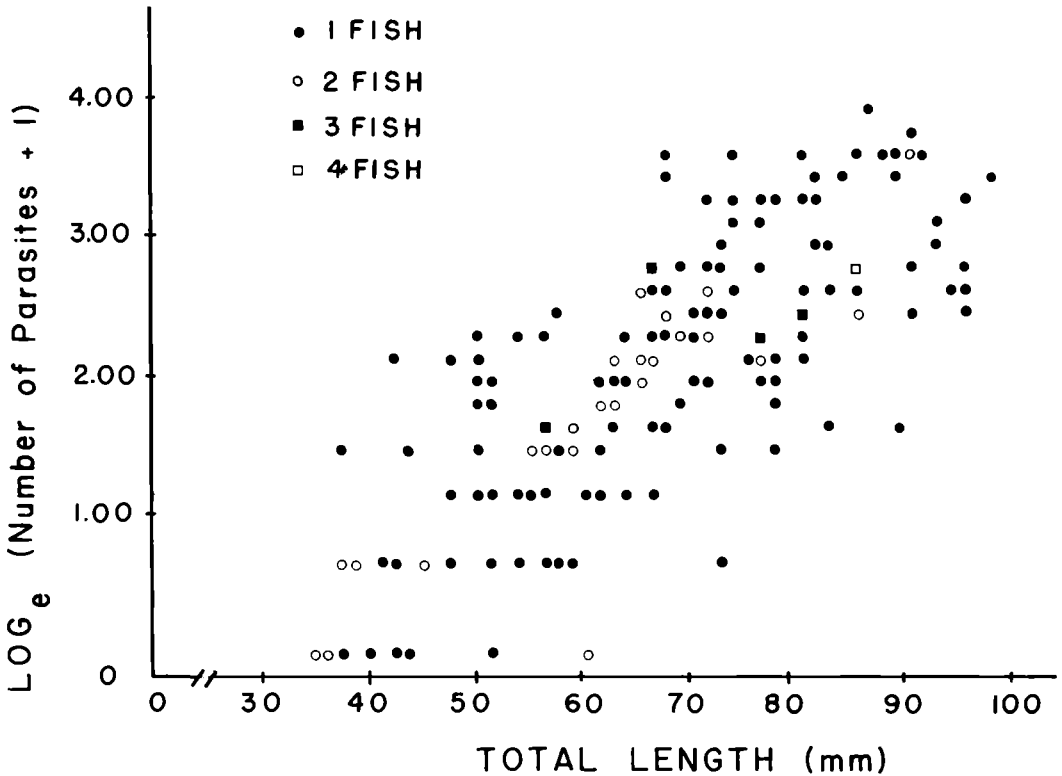


FIGURE 1.—Log-transformed (N + 1) regression of numbers (N) of *Leptorhynchoides thecatus* present in slimy sculpins on total length of fish.

feed on different organisms during the time of the year when recruitment of parasites is highest, and thus were differentially subject to infection.

Because fish moved into deeper, offshore water, slimy sculpins were not collected in sufficient numbers after May to allow seasonal periodicity in occurrence of adult *L. thecatus* to be examined. Esch et al. (1976) suggested that there may be seasonal trends in recruitment of adult parasites. The reported intermediate hosts for this parasite are not commonly found in the area where the sculpins used in this study were collected (Jude et al. 1978). This suggests the strong possibility that *Pontoporeia hoyi*, the most abundant amphipod in the area, may be serving as an intermediate host for *L. thecatus*.

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TABLE 1.—Loadings of *Leptorhynchoides thecatus* in slimy sculpins from eastern Lake Michigan.

Loading feature	Male fish N = 60	Female fish N = 82	Immature fish N = 34	All fish combined N = 176
<i>Number of fish per loading</i>				
Parasites per fish				
0	1	1	10	12
1-5	9	27	16	52
6-10	16	27	7	50
11-15	14	11	1	26
16-20	2	7	0	9
21-25	6	2	0	8
26-30	3	3	0	6
31-35	4	4	0	8
36-40	2	0	0	2
41-45	1	0	0	1
46-50	1	0	0	1
>50	1	0	0	1
<i>Mean loading and % infected</i>				
Mean parasites per fish	17	10	3	11
Percent of fish infected	98	99	71	93

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