

NOTES ON ASPIDOGASTRID TREMATODES AND HYDRACARINA FROM SOME TENNESSEE MUSSELS¹

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Although there are numerous reports on digenetic trematodes of the Reelfoot Lake area, Byrd (1938, 1939, 1940), Byrd and Reiber (1940, 1942), Byrd, Venard, and Reiber (1941), Byrd, Reiber, and Parker (1942), Byrd and Macy (1942), Bangham and Venard (1942), Goodman (1949, 1951), Parker (1941), Venard (1941), and others, and a few on monogenetic flukes, Mizelle and Jaskowski (1945), and Mizelle and Cronin (1945), nothing has been reported concerning aspidogastrid trematodes. With the exception of Hoff's work (1944), no extensive study has been made with reference to the Hydracarina of the mussels of the area.

An examination of some mussels from Bayou du Chien during July, 1954, resulted in the recovery of aspidogastrids and water mites. Twenty-eight specimens of mussels, 6 *Anodonta grandis* Say, 21 *Ligumia subrostrata* Say, and one *Uniomereus tetralasmus* Say, were collected from the slough at Walnut Log Boat Landing and the first few yards of the artificial canal which leads to Reelfoot Lake, and a single specimen of *L. subrostrata* from the Spillway. Since the geology, flora, and fauna of the slough have been described in several publications, it is probably sufficient to say here only that the bayou has no visible current, is covered with duckweed, is usually choked with coontail moss, and supports a large amount of submerged vegetation.

A summary of collection data with reference to fluke and mite infestations of the mussels is given in Table I.

All specimens of *A. grandis* were parasitized with eggs, larvae, and adult stages of mites, and with adult flukes. The six adult specimens of this mussel had an average of 97.5 trematodes and 67 mites. The single juvenile specimen had considerably fewer of both flukes and mites. *Ligumia subrostrata* had an average of 7.5 flukes and 4.2 mites with no significant difference with respect to male and female specimens of mussels. Although only one specimen of *Uniomereus tetralasmus* was examined, this having only one worm and no mites, the data indicate that this species and *L. subrostrata* are not as heavily parasitized as *A. grandis*. The single specimen of *L. subrostrata* collected from the Spillway was not infested with either mites or flukes. Two species of mites of the genus *Unionicola* were recovered from both *Anodonta grandis* and *Ligumia subrostrata*; one species is

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new and is related to *Unionicola ypsilophora* Bonz and the other may be *U. intermedia* Koenike or a new species related to *U. intermedia*. In addition, each of three specimens of *A. grandis* showed a mixed infestation of both species of mites. All specimens of the three species of mussels collected from the bayou were infested with trematodes, and 21 of the 28 specimens harbored mites.

TABLE 1. Number of trematodes, *Cotylaspis insignis* (?) Leidy, 1857, and mites, *Unionicola n. sp.* (near *ypsilophora* Bonz) and *Unionicola cf. intermedia* Koenike, from three species of mussels. (+ = present; - = absent)

MUSSELS	FLUKES	EGGS	MITES LARVAE	ADULTS
<i>Anodonta grandis</i>				
Specimen No. 1	68	+	+	62
2	87	+	+	117
3	73	+	+	53
4	102	+	+	83
5	43	+	+	60
6	212	+	+	27
7 (juvenile)	5	+	+	32
<i>Ligumia subrostrata</i> (males)				
Specimen No. 1	7	-	-	0
2	3	-	-	0
3	16	+	+	12
4	2	+	+	3
5	4	+	+	3
6	17	+	+	5
7	5	+	+	2
8	9	+	+	4
9	4	+	+	2
10	3	+	+	15
11	14	+	+	12
12	6	-	-	0
<i>Ligumia subrostrata</i> (females)				
Specimen No. 1	4	-	-	0
2	8	+	+	2
3	2	+	+	0
4	8	+	+	11
5	4	+	+	0
6	8	+	+	8
7	27	+	+	9
8	0	-	-	0
9	8	+	-	2
<i>Uniomereus tetralasmus</i>				
Specimen No. 1	1	-	-	0

MOLLUSCA

Byrd, Norton, and Denton (1940) reported 28 species of land and fresh water gastropods from the Reelfoot Lake Region. Hoff (1943) reported the bivalve, *Quadrula pustulosa* (Rafinesque), as occurring abundantly in the Moultrie Field region of the lower lake, a single specimen of *Anodonta corpulenta* Cooper, and numerous specimens of fingernail clams of the

genera *Musculium*, *Pisidium*, and *Sphaerium*. Goodman (1951) added information regarding the occurrence of gastropods in different areas of the lake. This report adds three species of bivalves collected from Bayou du Chien, viz., *Anodonta grandis*, *Ligumia subrostrata*, and *Unio merus tetralasmus*, to the molluscan fauna of the Reelfoot Lake Region.

HYDRACARINA

Hoff (1944) made a study of the Hydracarina of Reelfoot Lake and in his report included *Unionicola fossulata* (Koenike, 1895) from *Quadrula pustulosa* (Rafinesque) and *Anodonta corpulenta* Cooper. Specimens of *Anodonta grandis* and *Ligumia subrostrata* of this study showed both species of mussels to harbor two species of mites. According to Mitchell (personal communication), one is a new species related to *Unionicola ypsilophora* Bonz, and the other is *Unionicola intermedia* Koenike or a new species related to *U. intermedia*. A report on these mites will be published later by him. The adult mites of these species were recovered from the inner surface of the mantle, the gills, and from the grooves of the kidney adjacent to the visceral mass. Eggs and larvae of the mites were present in the mantle in large numbers, usually about two or three hundred. Some of the larvae were orange, others a bluish-green, but all were embedded in the mantle tissue and were non-motile.

TREMATODA

All of the specimens of aspidogastrid trematodes recovered from the mussels of this study appear to be *Cotylaspis insignis* Leidy, 1857. Although many of the worms were young adults and had not begun egg production, the greatest number were mature adults. No larvae were seen. The worms were recovered from various locations in the mussels: the foot, on the heart and kidney, on the gills, and within the gill filaments.

Worms placed in tap water and kept under refrigeration lived for several days. When the worms were placed in water, the eggs were immediately released from the uterus. The number of eggs in the uterus was usually 6 or 7, and in a few cases as many as 12. Since eggs in the terminal portion of the uterus are in an uncleaved condition, there presumably is no development in that structure, and the production of larvae takes place outside the uterus. Several attempts were made to hatch eggs which were incubated in water but development never proceeded beyond the fourth day. Despite cleaning the eggs by washing, bacteria would always accumulate on the egg shell.

There are several morphological features of the worms which are somewhat different from those of previously described specimens. An anatomical and histological study of the flukes is now in progress, the results of which will be published later.

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