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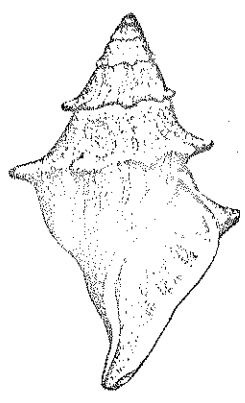
Stansbery  
1971

A. V. ZALE

THE AMERICAN  
MALACOLOGICAL  
UNION, Inc.



BULLETIN  
for 1971



AMU, Thirty-Seventh Annual Meeting

## THE MOLLUSK FAUNA OF THE NORTH FORK HOLSTON RIVER AT SALTVILLE, VIRGINIA

David H. Stansbery

THE OHIO STATE UNIVERSITY, COLUMBUS, OHIO MUSEUM OF ZOOLOGY

A combination of extensive deposits of valuable chloride salts at the site of the headwaters of one of the richest freshwater fauna regions of the world has made Saltville, Virginia, a focal point of concern to biologists and water pollution authorities alike. For some 75 years the Olin Chemical Corporation has maintained a soda ash operation here with its chloride wastes going into the relatively small North Fork Holston River. The Holston River proper is one of the largest headwater tributaries of the Tennessee River which originally had an endemic fauna of 24 species of naiads alone. Unfortunately the chemical industry had been in operation for at least seven years before the first observations were recorded on its effects on aquatic life. Adams (1915:18), in his classic work on *Io*, notes that in August, 1900,

"At and below the alkali works the refuse flowing into the river has covered all the rocks and the bed of the stream with a whitish coating. Natives reported that fish had been killed in great quantities by this refuse. Had this factory been located a few miles farther upstream, *Io* would have become extinct in all this portion of the stream. Such influences show the importance of studying the animals of our streams before such pollution."

Adams had collected a fine series of *Io fluviatilis* (Say, 1825) from the river above the polluted area. Collections in 1968 did not reveal the presence of *Io* at or anywhere above Saltville or at Holston, 20 miles downstream. The only pleurocerid snails found at that time came from above the Olin Corporation outfall. Abundant populations of *Oxytrema (Pleurocera) unciata* (Haldeman, 1841) and *Leptoxis (Anculosa) subglobosa* (Say, 1825) extended from within the Saltville city limits for miles upstream.

The first extensive collection of naiads made at Saltville proper was by Ortmann. He lists (1918:608) 15 species taken by himself in 1912 and cites 9 species collected there by Peterson in 1917 making a total of 16 different species. Dr. William J. Clench and I collected at Saltville in September

1968, and added two more unionid species bringing the list up to 18. Five species previously recorded (see table) were not found, however, indicating a fauna decreasing in species diversity.

Adams (1915:18), in his search for *Io*, made an effort to collect it at Holston in 1901. He found

"... the river apparently afforded an excellent habitat for *Io*. The water was shallow, about a foot deep, with an abundance of large rocks covered with a slimy algal growth and varied current from eddy to that of moderate swiftness. The water was clear, and yet no shells were found. I then examined the river for about a mile upstream... no *Io* were found except an old weathered shell. I was told by a resident that occasionally the "alkali" refuse came down in such a quantity as to give the river a milky color... Unionids were present, however, as shown by the bivalves on the banks where they had been opened by raccoons or muskrats."

The naiad shells collected by Adams at Holston became part of the Walker Collection and were listed by Ortmann (1918:609). There were 14 species in this collection and efforts by Clench and myself to find any of these forms at Holston in 1968 failed completely. The North Fork at Holston still looked much the same as it did to Adams in 1900, but the only mollusks found were a few *Physa* sp. in a pool alongside the river. It appears that the entire river fauna has been eliminated from this site.

Recent attempts to collect the North Fork as far downstream as Rotherwood, only one mile above its mouth, did not reveal any living species of river mollusks, naiads or pleurocerids. Ortmann (1918:610) took 34 species of naiads at Rotherwood in 1913. It appears that the North Fork is devoid of mollusk life from Saltville as far down as the point where it joins the South Fork forming the Holston proper. What effect this badly polluted tributary has on the main stream is not known.

Just recently the Virginia Water Control Board established strict new standards which make the

SPECIES RECORDED	Saltville, Va.				Holston, Va.		
	Ortmann, 1912	Peterson, 1917	Stansbery and Clench, 1968	Change	Adams, 1901	Stansbery and Clench, 1968	Change
Subfamily Anodontinae							
<i>Strophitus undulatus tennesseensis</i> Frierson, 1927	X	O	O	.	O	O	S
<i>Alasmidonta marginata</i> Say, 1818	X	O	O	.	O	O	S
<i>Alasmidonta viridis</i> (Rafinesque, 1820)	X	O	O	.	O	O	S
<i>Pegias fabula</i> (Lea, 1836)	X	X	O	.	X	O	.
<i>Lasmigona costata</i> (Rafinesque, 1820)	X	O	O	.	X	O	.
Subfamily Ambleminae							
<i>Fusconaia edgariana</i> (Lea, 1840)	O	O	1	+	X	O	.
<i>Fusconaia barnesiana</i> (Lea, 1838)	X	X	3	S	X	O	.
<i>Lexingtonia dolabelloides</i> (Lea, 1840)	X	X	1½	S	X	O	.
<i>Pleurobema oviforme</i> (Conrad, 1834)	X	X	3	S	X	O	.
<i>Elliptio dilatatus</i> (Rafinesque, 1820)	O	O	O	S	X	O	.
Subfamily Lampsilinae							
<i>Ptychobranhus fasciolaris</i> (Rafinesque, 1820)	O	O	1	+	O	O	S
<i>Ptychobranhus subtentum</i> (Say, 1825)	X	X	12	S	X	O	.
<i>Actinonitias pectorosa</i> (Conrad, 1834)	X	O	O	.	X	O	.
<i>Toxolasma l. lividum</i> (Rafinesque, 1820)	O	X	O	.	X	O	.
<i>Medionidus conradicus</i> (Lea, 1834)	X	X	15	S	X	O	.
<i>Conradilla caelata</i> (Conrad, 1834)	O	O	O	S	X	O	.
<i>Villosa iris nebulosa</i> (Conrad, 1834)	X	X	22	S	X	O	.
<i>Villosa vanuxemi</i> (Lea, 1838)	X	X	9	S	O	O	S
<i>Lampsilis ventricosa</i> (Barnes, 1823)	X	O	1	S	O	O	S
<i>Lampsilis fasciola</i> (Rafinesque, 1820)	X	O	4	S	X	O	.
Total Naiad Species Recorded	15	9	11		14	0	
Faunal Change in Numbers of Species				-5			-14

- X = species present  
 O = none taken  
 + = species added  
 . = species removed  
 S = same

continued operation of the Olin Corporation plant at Saltville economically unfeasible. Present plans are to phase out by December 1972 (Newcombe, 1971), but operations may stop before that time. Just how rapidly and to what extent the biota of the North Fork Holston can recover remains to be seen. The principle purpose of this paper is to summarize the changes which have occurred in the mollusk fauna up to the present time and to serve as a basis for comparison with such improvements as may hopefully occur in the not-too-distant future.

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