

## CHANGES IN THE GASTROPOD POPULATIONS OF THE WEST BRANCH OF THE MAHONING RIVER IN OHIO (1939-1963)<sup>1</sup>

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### I. INTRODUCTION

The West Branch of the Mahoning River arises in north-central Portage County in northeastern Ohio. It flows southward to the center of the county, then extends eastward into Trumbull County where it joins the Mahoning River in the southwest corner of Trumbull County. The West Branch is 30 miles long, has a fall of 300 feet, and drains 130 square miles. The upper level is swampy with a mud and sand bottom; the middle river has a rapid current with a sand and gravel bottom for the most part. This section is followed by a slower current with a sandy bottom. The lower level has a bottom of bedrock and rubble. Two tributaries, Barrel Run and Hinckley Creek, are included in the study. Very little pollution enters the stream until it passes through Newton Falls at station No. 10.

Louis H. Swart (1940) made a survey of the mollusks in the stream under the direction of the senior writer for his master's thesis at Kent State University. His field collections ranged from August 1939 to August 1940. Between November 1962 and November 1963 the survey was repeated by the senior writer with the aid of Joseph Beckett. The original collections were largely identified by Dr. William J. Clench at the Museum of Comparative Zoology, Harvard University, and by Calvin Goodrich,

Museum of Zoology at the University of Michigan. Specimens of *Ferrissia* were identified recently by Dr. Paul F. Basch. Collections have been made at 10 stations from the head waters to the dam at Newton Falls. These stations represent all habitats in the stream (the 11th station sampled by Swart was not included in the second survey). The collecting effort in the two surveys was approximately the same.

### II. CHANGES IN THE GASTROPOD POPULATIONS 1939-40 : 1962-63

After an interval of 23 years, the snail populations in the West Branch of the Mahoning River were found to vary as shown in Table 1 and in the following analysis of that table.

#### *Physa integra*; *P. gyrina*

These two species of *Physa* have been identified in the stream. However, since they are not always easily separated and not all of the collected specimens were critically examined, they are grouped together here for purposes of comparison. They were less abundant generally in the later survey except for three stations, but they did have a very similar, nearly universal distribution throughout the 10 stations.

#### *Ferrissia fragilis*

This limpet was much less abundant during the second survey. All stations had fewer specimens, and four of the formerly occupied stations did not yield specimens in 1962-63. The species is now less widely distributed.

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Table 1. Changes in Gastropod Populations in West Branch of Mahoning River, 1939-1963

	Stations										Totals	
	1	2	3	4	5	6	7	8	9	10		
<i>Physa integra</i> ;												
<i>P. gyrina</i>	1-19	49-26	48-120	22-9	56-10	3-31	26-23	4-0	100-12	156-82	465-332	
<i>Ferrissia</i>												
<i>fragilis</i>	35-13	50 <sup>+</sup> -6	22-0	59-0	14-2	4-0	25-0		41-15	50-16	300 <sup>+</sup> -52	
<i>Campeloma</i>												
<i>integrum</i>	85-5	35-0						9-0	3-0	153-0	285-5	
<i>Helisoma anceps</i> ;												
<i>H. trivolvis</i>	0-60	10-0	0-1				15-9		1-0	5-0	31-70	
<i>Lymnaea</i>												
<i>humilis</i>			42-1	0-1			0-1			0-20	42-23	
<i>Amnicola</i>												
<i>integra</i>				1-32		0-23	19-6		4-4	20 <sup>+</sup> -1	44 <sup>+</sup> -66	
<i>Amnicola</i>												
<i>limosa</i>							0-4				0-4	
<i>Valvata</i>												
<i>tricarinata</i>							1-0			42-0	43-0	
<i>Goniobasis</i>												
<i>livescens</i>									20 <sup>+</sup> -226	50-0	70 <sup>+</sup> -226	
No. species	4-6	6-3	4-4	4-4	3-3	3-3	7-7	3-0	7-5	9-5	10-10	

*Campeloma integrum*

This species was greatly reduced by the second survey. In 1962-63 it was found in the headwater station only. It was absent from four stations formerly occupied, and only a few specimens were collected from the headwaters.

*Helisoma anceps*; *H. trivolvis*

Because not all specimens of *Helisoma* were identified the two species collected are combined here for our purposes. *Helisoma* showed a great increase in abundance in the headwaters where this group replaced *Campeloma* as the common genus. *Helisoma* was either less abundant or was not collected elsewhere, and was much less widely distributed in 1962-63. The total collection of specimens, however, was greater than in the original survey because of the large population at station No. 1.

*Lymnaea humilis*

There was a great reduction of this species at one station (station 3), but this species was found over a wider range in 1962-63.

*Amnicola integra*

More specimens of this species were found in

the upper level, but fewer were collected at the lower level. The total collection, however, was comparable between the two periods of time.

*Valvata tricarinata*

*Valvata tricarinata* dropped out from the collections made in recent years, but *Amnicola limosa* replaced it. Both of these 'pond' species are found in the stream where pond habitats develop largely as a result of vascular vegetation becoming established in the stream.

*Goniobasis livescens*

While this species increased at one station, it was absent from the other where it was formerly found. It was somewhat more abundant in the recent survey, but was more restricted in distribution.

## SUMMARY

Gastropods of the West Branch of the Mahoning River in Portage and Trumbull Counties, northeastern Ohio, were sampled at 10 stations in 1939-40 and 1962-63. On each survey 10 species were collected. One dropped out (*Valvata*

*tricarinata*), but another one was newly added to the list (*Amnicola limosa*). During the 1939-40 survey the stations averaged five species of snails. In the later survey of 1962-63 the stations averaged four species. Five stations had the same number of species during the two surveys. Only one station (station 1 at the headwaters) had a greater number of species in 1962-63, but four stations had a smaller number at that time.

Two groups (*Helisoma* and *Goniobasis*) showed a general increase in abundance. On the other hand, four groups (*Physa*, *Ferrissia*, *Campeloma*, and *Lymnaea*) showed a decrease in abundance between the two periods of time.

*Physa* spp. and *Amnicola integra* showed the same distribution pattern. *Lymnaea* became more widely distributed, but five others were less widely distributed in the later years. These were *Campeloma integrum* (now found only in the headwaters), *Ferrissia fragilis*, *Helisoma anceps*, *H. trivolvis*, and *Goniobasis livescens*.

Fewer snails were collected at seven stations in 1962-63. More snails were found at only two stations (stations 3 and 6) in the recent survey. The results in general were quite different from those found in the Salt Fork of the Big Vermilion River in Illinois (1918-1959). There, a greater abundance and a wider distribution of snails were found after a lapse of 40 years (Dexter, 1961).

#### LITERATURE CITED

DEXTER, Ralph W., 1961. Changes in the Gastropod Populations in the Salt Fork of the Big Vermilion River in Illinois, 1918-1959. -- *STERKIANA* 3: 15-18.

SWART, Louis H. 1940. An Ecological Survey of the Mollusks of the West Branch of the Mahoning River. -- M. A. Thesis, Kent State University Library, Kent, Ohio.

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