

Some Observations on the Ecology of *Plumatella repens* (L.) (Bryozoa: Plumatellidae) in Northeastern North Dakota

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The ectoproct bryozoan, *Plumatella repens* (L.), was qualitatively sampled from a small prairie stream, the Forest River in northeastern North Dakota, during a reconnaissance from June 1970 to November 1971. The opportunity to obtain information on bryozoan ecology developed when I routinely sampled the river for limnological data pertaining to aquatic insect communities in riffles above and below sources of pollution. The chemical and insect data will be treated in another article.

The Forest River originates in southwestern Walsh and northeastern Nelson Counties, which are in the Drift Prairie of the Central Lowland Province (Fenneman, 1938), passes through northwestern Grand Forks County and discharges into the Red River of the North, east of Minto in Walsh County. With 3 tributaries, the North, Middle, and South Branches, the Forest River has a drainage area of approximately 510 mi². Sampling was taken at stations located on all 3 tributaries and also on the Main Branch. North Dakota Highways 18 and 32 marked the eastern and western margins of the study area.

Pieces of substrate with bryozoans attached in situ were taken to the laboratory, relaxed with chloral hydrate, then strained and preserved as suggested in Ward and Whipple (1959). Stratoblasts and zooids were mounted in diaphane for microscopic examination.

Except for a small colony found on August 16, 1970, 3 mi. NW of Inkster near the University of North Dakota Biology Area, *Plumatella repens* was predominantly found at headwater riffles during the 1970 water year. On May 29, 1971 colonies were found at 2 points on the Main Branch. Presumably, distribution in the Main Branch was related to the high spring discharge. Melting ice and snow may have diluted agricultural contaminants entering the river 3 mi. upstream from the biology area.

The Middle Branch was the only tributary having no discharge during the summer of 1970. As a result of reduced discharge, the greatest bryozoan density was shifted from the Middle to the North Branch—this condition was similar to that mentioned by Scott (1958). Largest colonizations were discovered on a submerged concrete culvert base in the Middle Branch between June 30 and July 15, when the depth of the water discharging over the concrete was approximately 2 inches. After July 15, colonies deteriorated as the Middle Branch became dry. Bryozoans persisted in the Middle Branch in pools to a depth of about 6 inches until September 12, although zooids had disappeared on the concrete by August 25. Other macrobenthic residents (not including insects) of the drying pools in the center of the stream bed were: leeches, fingernail clams (*Pisidium* sp.), snails (*Physa* sp.), ostracods, amphipods, crayfish, and horsehair worms (*Gordius* sp.).

During this period discharge varied from 0 to 240 cfs at headwater sites

and from 5.4 to 2,160 cfs in the Main Branch near Fordville (USGS, 1970 and 1971). Temperatures ranged from 0 to 31 C inclusive of measurements made in shallow pools.

Bryozoan substrates observed included: concrete slab, rocks, gravel, vegetation (particularly stems of cattails and decomposing logs), and cases of caddisflies (*Limnephilus submonilifer* and *Leptocella diarina*). Broken fragments of zooids were occasionally used by the midge, *Microtendipes* sp., to construct cases.

Few bryozoans have been recorded for northern intermontane states west of the Mississippi River (Vaughn and Brummel, 1963). Specimens mentioned in this report are the first records of this species for North Dakota and the three counties. Although there are no records of *Plumatella repens* from the southern end of the Red River Valley in North Dakota, it likely occurs there (G. Comita, NDSU, personal communication). The first collection of *Plumatella* in North Dakota was from the Turtle River at the Turtle River State Park near Arvilla, Grand Forks County, by G. C. Wheeler on September 25, 1950. This has been identified as *P. fungosa*. Specimens from that collection and also another from the same locality on September 27, 1950 by W. E. Laberge are present in the museum in the Biology Department at the University of North Dakota in Grand Forks.

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LITERATURE CITED

- Fenneman, N. M. 1938. *Physiography of eastern United States*. McGraw-Hill, New York. 559-588.
- Scott, D. C. 1958. Biological balance in Streams. *Sew. and Ind. Wastes*. 30(9): 1169-1173.
- U.S. Geological Survey. 1970. *Water resources data for North Dakota*. Part 1. Surface Water Records. Washington, D.C. 46-47.
- . 1971. *Water resources data for North Dakota*. Part 1. Surface Water Records. Washington, D.C. 46-47.
- Vaughn, C. M. and C. N. Brummel. 1963. The Spongillidae and Bryozoa of eastern South Dakota. *Proc. S. Dak. Acad. Sci.* 42: 103-107.
- Ward, H. B. and G. C. Whipple. 1959. *Fresh water biology*. 2nd Ed. W. E. Edmondson, Ed. John Wiley and Sons. New York. 495-507.