

Marion Bacon¹

Eastern Washington University
Cheney, Washington 99004

A Study of Surface Waters and Sediments in Southern Spokane County, Washington, for the Presence of *Yersinia enterocolitica*

Abstract

During the period September 1977 through May 1979, investigations were conducted for the presence of the pathogenic bacterium, *Yersinia enterocolitica*, in surface waters of southern Spokane County, Washington. Collection sites were located on the Spokane River and at various lakes, ponds, marshes, and streams. Only one of 433 water and sediment samples was positive for *Y. enterocolitica*.

During the period September 1977 through May 1979, investigations were conducted at Eastern Washington University, Cheney, Washington, for the presence of the pathogenic bacterium, *Yersinia enterocolitica* (Frederiksen, 1964), in surface waters of southern Spokane County.

Methods and materials employed for isolating the bacterium included those used by Harvey *et al.* (1976), Saari and Quan (1976), and Wetzler (1978-1979). All of these prescribe incubation in enrichment media of inocula taken directly from water samples and the subsequent plating out of these cultures onto diagnostic agars. During most of the present studies, a modification was made of these methods in that bacteria in the water samples were concentrated by passing 50-500 ml of sample through a cellulose filter, pore size 0.45 μ (Millipore). The entire filter disk was then used to inoculate a culture tube of enrichment broth.

Water and/or sediment samples were taken at 30 different sites at various lakes, ponds, marshes, minor streams, and the Spokane River. The most numerous collections were made from nine sites on the Spokane River along its course through metropolitan Spokane, and from the Turnbull Refuge Natural Area.

Only one of a total of 433 water and sediment samples was positive for *Y. enterocolitica*. This sample was from the Spokane River within the city limits. Samples taken from this site on 26 other occasions all tested negative.

The almost entirely negative results in this study may have been due in part to the fact that no completely reliable method has yet been developed for isolating *Y. enterocolitica* when the organism is present in low concentration, especially when such competing organisms as *Proteus* spp. are present. However, the procedures used in the present study were all adaptations of those by which other investigators have successfully isolated *Y. enterocolitica* from water in California (Harvey *et al.*, 1976), Colorado (Saari and Quan, 1976), and western Washington (Prior, 1976; Wetzler, 1978). The inference, therefore, from the results of the present study is that there is a very low incidence of *Y. enterocolitica* in the surface waters of southern Spokane County.

¹Present address: 107 Seventh Street, Cheney, Washington 99004.

Acknowledgments

This project was supported principally by research funds provided by Eastern Washington University. Jimmie A. Lakey completed studies involving collections from the Spokane River from June to November 1978 as the basis of a research report in partial fulfillment of the requirements for the degree of Master of Science in Biology. Field and laboratory work were conducted with the assistance of graduate student Jimmie A. Lakey, and undergraduates George F. Hodges, Randolph E. Noltre, Keven L. Llewellyn, William P. Werschler, Brad D. Bisson, and Raymond M. Tsuchida, all of Eastern Washington University.

Dr. Ted F. Wetzler, University of Washington, provided valuable advice on selection of materials and methods, and verified the author's identification of the isolate of *Y. enterocolitica*.

Literature Cited

- Harvey, S., J. R. Greenwood, M. J. Pickett, and R. A. Mah. 1976. *Yersinia enterocolitica* from streams and lakes of California. *Appl. Environ. Microbiol.* 32:352-354.
- Prior, B. W. H. 1976. *Yersinia enterocolitica* in Surface Waters of Western Washington. Univ. of Washington, Seattle. M.A. thesis (Thesis No. WA 724373).
- Saari, T., and T. J. Quan. 1976. Waterborne *Yersinia enterocolitica* in Colorado. Presented at the Annual Meeting of Amer. Soc. Microbio., Atlantic City. (Abstr. No. C119.)
- Wetzler, T. F. 1978. Univ. of Washington, Seattle. Pers. comm.
- . 1979. Univ. of Washington, Seattle. Pers. comm.

Received June 20, 1980

Accepted for publication September 15, 1980