Microbial Sources Tracking

Mansour Samadpour[1]

The lack of appropriate methodology for tracing bacterial contamination in the environment is a major impediment in identification and control of the sources of these pollutants and adversely affects the decision-making process in water-quality and fisheries-resources management. Several methods for tracking genetically engineered microorganisms have been used, but their utility is limited to the detection of organisms carrying reporter genes or their products. Limited efforts to track sources of natural bacterial populations have been made; the approach used was based on quantification of indicator organisms at various sites. These studies invariably have raised more questions than answers. I have developed and tested a tracking system for identification of sources of microbial pollution. The methodology can be used to identify and assess the impact and contribution of nonpoint sources of microbial pollution and to establish and characterize the impact of the point sources of microbial pollution in fecal runoff. The method can be used to identify the sources of fecal coliforms at the species level and map their distribution, transport, and movement in watersheds, rivers, lakes, and drinking-water-distribution systems. Microbial sources tracking studies conducted in a closed watershed, a swimming beach, and an industrial wastewater-treatment plant will be presented and discussed.

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[1]University of Washington, Department of Environmental Health, School of Public Health and Community Medicine, Seattle, WA 98195 (mansour@u.washington.edu)