

Tracking the Source of Microbial Pathogens in Our Streams

SUMMARY

Fecal contamination of water is very common. In the United States, prevention is complicated by the colossal span of waterways (>3.5 million miles) and heterogeneous sources of pollution. Non-point source pollution such as runoff from pastures and cropland, parking lots, lawns, mines and septic systems accounts for more than half of the United States water quality impairments.

SITUATION

Identification of sources of fecal contamination is important for designing effective remediation strategies of polluted water and also because exposure to the feces of different hosts is associated with different human health risks.

RESPONSE

Bacteroidales are bacteria found in fecal material. It is an anaerobic bacterium that has limited survival after release into the environment. Thus its presence in water suggests recent contamination. It is possible to determine whether a specific *Bacteroidales* comes from hosts such as humans, cattle, pigs, etc. We found abundant amounts of *Bacteroidales* in Ohio's streams and the potential for host-specific qPCR detection makes *Bacteroidales* a potentially useful tool in contamination detection.

IMPACT

Host assessment and quantification of *Bacteroidales* using modern DNA amplification methods has great potential for predicting fecal contamination due its sensitivity, rapid analysis, and availability of host-specific assays. However, the lack of strong correlation between bacterial pathogens and general fecal indicators suggests that assessment of health risk associated with fecal contamination will require a complement of approaches to accurately predict health risks associated with bacterial pathogens in Ohio's streams, rivers and lakes.

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