



This research has contributed to provide new tools for accurate identification of the sources of fecal pollution for surface water quality control and management.

Faecalibacterium-like Bacteria for Tracking Agricultural Source of Fecal Pollution in Surface Water

Who cares and why?

Fecal pollution of water is a risk to human health. Waterborne disease-causing pathogens may come from human and animal feces. Yearly, fecal pollution from point and nonpoint sources causes many waterborne-disease outbreaks in United States. The US Environmental Protection Agency (EPA) recommends using *E. coli* and enterococci as the indicator bacteria to measure fecal pollution of fresh and marine water. However, the presence of the indicator bacteria does not provide information of the host source(s) of pollution; and that information is needed so that the pollution source can be removed or remediated.

What has the project done so far?

This research has explored the use of *Faecalibacterium*-like bacteria as the alternative fecal indicators for tracking the host sources of fecal pollution. The *Faecalibacterium*-like bacteria is among the dominant fecal bacteria, more abundant than *E. coli* and enterococci in many warm-blood animals. More importantly, the bacteria have been demonstrated by previous studies to have a host-specific distribution. With this project, the genetic markers of four *Faecalibacterium* specific to poultry (including poultry and turkey) feces, two *Subdoligranulum* (closely related to *Faecalibacterium*) unique to swine feces, and one *Phascolarctobacterium* (closely related to *Faecalibacterium*) have been identified. Based on the DNA sequences of these genetic markers, three polymerase-chain-reaction (PCR)-based methods have been developed for identification of agricultural source (cattle, poultry, and swine) of fecal pollution in water.



What research is needed?

The new methods have been tested locally and need to be verified and validated using various samples from different locations across the States for a broader application.

Impact Statement

The new methods can be extended to be used in tracking fecal pollution in food system to reduce the risk of food safety. Water systems can be better managed using these tools. The methods will also assess the health risk more precisely.

For more information:

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Additional link can be found at <http://www.umes.edu/ard/Default.aspx?id=46285>