SCCWRP Annual Report 2007

Differences in survival among *Enterococcus faecalis* subspecies in two freshwater creek sediments

Yucheng Feng[1], Peter G. Hartel[2], Jared A. Fisher[2], Karen Rodgers[2], Bin Liu[1] and Kerry J. Ritter

[1]*Auburn University, Department of Agronomy and Soils, Auburn, AL*

[2]*University of Georgia, Department of Crop and Soil Sciences, Athens, GA*

ABSTRACT

While bacterial source tracking (BST) has proven to be a useful and relatively inexepensive method for detecting human and bird fecal contamination in environmental waters, research suggests that some subspecies of fecal indicator bacteria are better adapted than others to survive different environmental conditions and stresses. We determined the survival of seven different *E. faecalis* subspecies, three from different wastewater treatment plants and one from a latrine (presumably all of human origin), two from birds, and the American Type Culture Collection (ATCC) type strain, in two freshwater creek sediments, Saugahatchee Creek in Alabama and Tanyard Creek in Georgia. Ribotyping was used to identify different subspecies. Survival was determined in modified sentinel chambers (Microfilterfuge™ tubes sealed at both ends with ≤0.45-µm membranes). Each Enterococcus ribotype was inoculated into sentinel chambers at approximately 10^{5-6} bacteria per g dry weight of sediment, and the Most-Probable Number (MPN) was estimated at Days 0 and 11. The MPNs of the seven *E. faecalis* subspecies declined 62.4 to 95.2% in Alabama sediment; MPNs of the same subspecies declined 95.4 to 99.6% in Georgia sediment. There was no positive correlation among the subspecies that survived better in Alabama sediment and those that survived better in Georgia sediment. Statistical analyses suggest that not only did differences in survival exist among subspecies of *E. faecalis*, but also that differences existed between locations. However, in terms of BST, the rapid decreases in MPNs suggested that any subspecies adaptation to environmental conditions was minor.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2007AnnualReport/AR07_103_108.pdf