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**SURFACTANT-FACILITATED TRANSPORT OF CRYPTOSPORIDIUM  
PARVUM IN SOIL**

Christophe Darnault\*, Astrid Jacobson, Shooka Karimpour  
University of Illinois at Chicago  
\*darnault@uic.edu

Abstract:

Cryptosporidium parvum oocysts are a serious and widespread concern in watersheds supplying water for human use and consumption and are responsible for many waterborne disease outbreaks within the United States. Agricultural land, feedlot runoff, and land application of manure are suspected sources of Cryptosporidium parvum. To better understand the mechanisms by which the pathogen moves through soils and contaminates water resources, they must be studied under conditions representative of real-world scenarios, where both Cryptosporidium and chemicals that affect their fate are present in soils. Chemicals such as surfactants occur widely in soils due to practices such as waste-water irrigation and the application of pesticides in surfactant solution sprays. This paper presents our research on the surfactant-facilitated transport of C. parvum in agricultural and/or rangeland soils from Utah and Illinois. The aim of our research is to investigate through a series of laboratory experiments whether surfactants decrease the surface tension of soil solutions to such an extent that the ability of Cryptosporidium oocysts to sorb at the air-water interfaces is reduced and thus their mobility through the vadose zone increased. We will present our approach and methods to evaluate the sorption and desorption of oocysts onto soil particles in the presence of natural and industrial surfactant solutions, to investigate the mobility of oocysts in the presence of surfactants in structured and non-structured soil columns, to explore the effects of surfactants on fluid movement in porous media by capillary rise and infiltration, and to develop recommendations for best management practices related to the land application of surfactants for the protection of agricultural watersheds and public health.

Impact Statement:

These research findings on the surfactant-facilitated transport of Cryptosporidium in the subsurface environment will be a resource for the USDA as well as the Departments of Agriculture of Illinois and Utah that can be used to improve best management practices and sources water protection in agricultural watersheds for the benefits of the public health and the environment.

Category: Watershed Assessment and Restoration  
Type of Presentation: Poster Presentation