Cover Stories:

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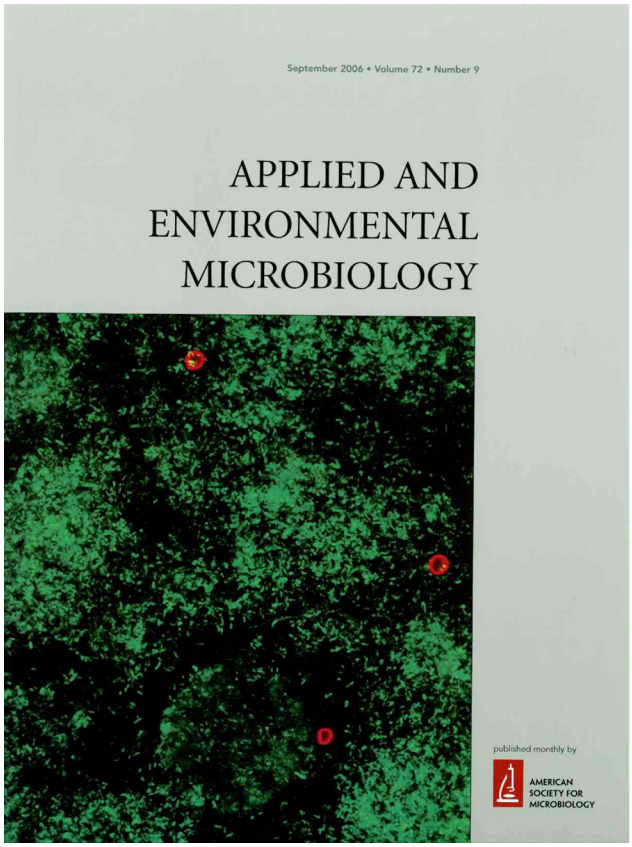
Searcy, K.E., Packman, A.I., Atwill, E.R., and Harter, T., 2006, Capture and Retention of *Cryptosporidium parvum* Oocysts by *Pseudomonas aeruginosa* Biofilms, *Applied and Environmental Microbiology*, 72(9), 6242–6247.



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The increasing prevalence of zoonotic diseases, those transmitted from animals to humans, is of national and international concern. *Cryptosporidium spp.* has particularly been noted as an emerging waterborne pathogen because it frequently occurs in animal herds, is transmitted in the form of cysts that are highly persistent in natural aquatic systems, and is difficult to disinfect in drinking water treatment systems. As a result, Cryptosporidium released from animal agriculture poses a significant threat to human health even after long transport distances. This organism was responsible for the largest waterborne disease outbreak in modern U.S. history, sickening over 400,000 people in a single event in Milwaukee in 1993.

Despite the importance of Cryptosporidium and other zoonotic pathogens, scientists are only beginning to understand the processes that control these organisms' migration and survival in aquatic systems such as streams and rivers. This research describes the deposition and retention of Cryptosporidium oocysts in bacterial biofilms. Biofilms are microbial communities that form on a wide variety of surfaces, including soils and streambed sediments. The researchers showed that there is increased deposition and retention of Cryptosporidium in the gelatinous biofilm matrix. In addition, the biofilm morphology affects Cryptosporidium deposition, specifically the deposition rate increases with increasing biofilm roughness. These results reflect the role of sedimentary biofilms in mediating waterborne disease transmission in freshwater environments. Deposition onto biofilm-coated surfaces reduces pathogen concentrations during transport in surface waters. In addition, the increased retention in sedimentary biofilms provides additional time for pathogens to die before reaching municipal water supplies. However, high-flow events that mobilize sediments could potentially release accumulated pathogens in large numbers. Although this study provides insight on this topic, more research is necessary to fully understand the transmission of waterborne disease and particularly to assess and mitigate the risks associated with zoonotic pathogens from animal agriculture.

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