

# PARASITOLOGY

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## Bioaccumulation of waterborne parasites *Entamoeba histolytica*, *Cryptosporidium* spp. and *Giardia duodenalis* in freshwater bivalvia

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Although water is considered as one of the best investigated media, waterborne transmission of life-threatening microorganisms still constitutes a serious global health risk. *Cryptosporidium* spp., *Giardia duodenalis* and *Entamoeba histolytica* are the main causative agents of water associated outbreaks of parasitic protozoan diseases documented worldwide. The pathogens are transmitted inter alia by ingestion of food or water contaminated by their transmissive stages (cysts or oocysts). We investigated the bioaccumulation of parasite stages in mussels downstream of wastewater treatment plants in the Rhine basin, Germany. The aim was to gain an in-depth understanding of the transmission dynamics of the pathogens by examining the links between wastewater discharge and the prevalence and dissemination of the pathogens. Thirty mussels of *Dreissena polymorpha* and *Corbicula fluminea* have been tested for the presence of *Cryptosporidium* spp., *G. duodenalis* and *E. histolytica* using modified Ziehl-Neelsen and Hematoxylin and Eosin (H&E) staining techniques. *Cryptosporidium* spp. and *E. histolytica* were detected in 60% (18) and *G. duodenalis* in 36% (11) of the samples examined. Few countries have laws that require regular monitoring of waterborne parasites in drinking water supplies and of their surveillance in wastewater treatment plants. Bivalvia are fundamental elements of the invertebrate biocoenosis in aquatic environments and are relatively site-faithful indicators. Owing to the filter-feeding habit of the bivalvia accumulation of parasite stages during filtration of hundreds litres of water is possible. Therefore, mussels could be perfect biomonitors for the detection of waterborne parasites.

### Biography

Caroline Ajonina is a Molecular Biologist and Researcher at the Institute of Wastewater Management and Water Protection, Hamburg University of Technology (TUHH). Her main research areas include developing innovative methods for the identification of pathogens in wastewater effluents and the biological monitoring of water quality. She has worked on wastewater management in the public, private and non-profit sectors in Africa and Germany. In her current research, she investigates the downstream survival and dissemination of protozoans in bivalvia spread by wastewater effluents, focusing on the Rhine and Elbe river courses.

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