

PARASITOLOGY

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Application of the loop mediated isothermal amplification for the detection of *Entamoeba histolytica*, *Cryptosporidium* spp., and *Giardia duodenalis* in freshwater bivalviaCaroline Ajonina¹, Carmen Gallas-Lindemann², Michael J Noack³, Ralf Otterpohl¹ and Isaia Sotiriadou³¹Hamburg University of Technology, Germany²Linksniederrheinische Entwässerungs-Genossenschaft, Germany³University of Cologne, Germany

A study is on-going to investigate the epidemiology of three major protozoan parasites of public health significance: *Entamoeba histolytica*, *Giardia duodenalis* and *Cryptosporidium* spp. It has been shown that surface waters are frequently contaminated by effluents from wastewater treatment plants, livestock farming and straying animals. Due to the ability of bivalves to recover and concentrate environmentally derived human pathogens, they can therefore be used for the estimation of environmental hygiene. In this study prior evaluated loop-mediated isothermal amplification (LAMP) assays are used for highly specific, efficient, simple and rapid detection of these protozoans in mussels which are collected in the catchment area of the Lower Rhine downstream of wastewater discharges. With sets of six primers each to target the *Giardia* EF1A gene, the *Cryptosporidium* SAM-1 gene and the *E. histolytica* hemolysin gene HLY6 DNA fragments are amplified by LAMP. The amplification of DNA in the LAMP mixture is monitored either directly for the presence of turbidity and colorimetric change under ambient light and confirmed by agarose gel electrophoresis. In comparison to conventional PCR, LAMP assay is beneficial and therefore most convenient for the detection of these parasites in the aquatic environment including tissues from filter feeding invertebrates. Additionally we could demonstrate that mussels are suitable biomonitors for statutory neglected hygiene parameters like waterborne protozoan 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-for-profit sectors in Africa and Germany. In her current research, funded by the "Deutsche Forschungsgemeinschaft" (DFG), she investigates the down-stream survival and dissemination of protozoans in bivalvia spread by wastewater effluents, focusing on the Rhine and Elbe river courses.

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