

Assessment of Conventional Drinking Water Treatment Plants as Removal Systems of Virulent Microsporidia

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Abstract : Microsporidia comprises various pathogenic species can infect humans by means of water. Moreover, chlorine disinfection of drinking-water has limitations against this protozoan pathogen. A total of 48 water samples were collected from two drinking water treatment plants having two different filtration systems (slow sand filter and rapid sand filter) during one year period. Samples were collected from inlet and outlet of each plant. Samples were separately filtrated through nitrocellulose membrane (142 mm, 0.45 μ m), then eluted and centrifuged. The obtained pellet from each sample was subjected to DNA extraction, then, amplification using genus-specific primer for microsporidia. Each microsporidia-PCR positive sample was performed by two species specific primers for *Enterocytozoon bienersi* and *Encephalitozoon intestinalis*. The results of the present study showed that the percentage of removal for microsporidia through different treatment processes reached its highest rate in the station using slow sand filters (100%), while the removal by rapid sand filter system was 81.8%. Statistically, the two different drinking water treatment plants (slow and rapid) had significant effect for removal of microsporidia. Molecular identification of microsporidia-PCR positive samples using two different primers for *Enterocytozoon bienersi* and *Encephalitozoon intestinalis* showed the presence of the two previous species in the inlet water of the two stations, while *Encephalitozoon intestinalis* was detected in the outlet water only. In conclusion, the appearance of virulent microsporidia in treated drinking water may cause potential health threat.

Keywords : removal, efficacy, microsporidia, drinking water treatment plants, PCR

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