

Detection of Cryptosporidium Oocysts by Acid-Fast Staining Method and PCR in Surface Water from Tehran, Iran

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Abstract : Background and Objective: Cryptosporidium is a coccidian protozoan parasite; its oocysts in surface water are a global health problem. Due to the low number of parasites in the water resources and the lack of laboratory culture, rapid and sensitive method for detection of the organism in the water resources is necessarily required. We applied modified acid-fast staining and PCR for the detection of the Cryptosporidium spp. and analysed the genotypes in 55 samples collected from surface water. Methods: Over a period of nine months, 55 surface water samples were collected from the five rivers in Tehran, Iran. The samples were filtered by using cellulose acetate membrane filters. By acid fast method, initial identification of Cryptosporidium oocyst were carried out on surface water samples. Then, nested PCR assay was designed for the specific amplification and analysed the genotypes. Results: Modified Ziehl-Neelsen method revealed 5-20 Cryptosporidium oocysts detected per 10 Liter. Five out of the 55 (9.09%) surface water samples were found positive for Cryptosporidium spp. by Ziehl-Neelsen test and seven (12.7%) were found positive by nested PCR. The staining results were consistent with PCR. Seven Cryptosporidium PCR products were successfully sequenced and five gp60 subtypes were detected. Our finding of gp60 gene revealed that all of the positive isolates were Cryptosporidium parvum and belonged to subtype families IIa and IIc. Conclusion: Our investigations were showed that collection of water samples were contaminated by Cryptosporidium, with potential hazards for the significant health problem. This study provides the first report on detection and genotyping of Cryptosporidium species from surface water samples in Iran, and its result confirmed the low clinical incidence of this parasite on the community.

Keywords : Cryptosporidium spp., membrane filtration, subtype, surface water, Iran

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