

Identification of *Cryptosporidium* spp. in Waterpark Seksyen 7, Shah Alam, Selangor

Nor Ain Aishah Mohd Nawawi, Tengku Idzzan Nadzirah Tengku Idris*

Structured Abstract

Background: *Cryptosporidium* spp. are parasitic protozoa known to cause waterborne diseases, especially in recreational waters where human exposure is high. These protozoa are resistant to conventional chlorination and pose a significant public health concern. The aim of this study was to detect the presence of *Cryptosporidium* spp. in selected water samples collected from a public waterpark in Seksyen 7, Shah Alam, Selangor, using a combination of microscopic and molecular techniques.

Methods: Seven water samples were collected from various locations within the waterpark. The samples underwent concentration through zinc sulphate flotation, followed by microscopic examination using the Ziehl-Neelsen acid-fast staining method to detect oocyst morphology. Subsequently, DNA extraction was performed, and PCR targeting the 18S rRNA gene was conducted to confirm the presence of *Cryptosporidium* spp. Amplified products were visualized using agarose gel electrophoresis.

Results: Microscopic observations revealed oocyst-like structures in 3 of 7 samples, with dimensions consistent with *Cryptosporidium* spp. (4–6 µm). However, Ziehl-Neelsen staining showed weak acid-fast reactions, likely due to low oocyst concentration. PCR amplification produced a single, clear band of ~250 bp in Sample 7, indicating successful detection of *Cryptosporidium* DNA. No bands were detected in the remaining samples or in the negative control. This finding aligns with earlier microscopic results, suggesting localized contamination. The presence of animals, human activity, and stagnant water areas likely contributed to the contamination.

Conclusion: This study demonstrates that combining flotation, staining, and PCR provides a reliable approach for detecting *Cryptosporidium* spp. in recreational water environments. The detection of protozoan parasites in public waterparks underscores the need for regular monitoring and improved sanitation to minimize health risks to visitors.

Keywords: *Cryptosporidium* spp., Waterborne Protozoa, PCR Detection, Ziehl-Neelsen Staining, Recreational Water

*Correspondence: tengkuidzzan@uitm.edu.my

School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia.