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## Comparative detection of *Giardia* and *Cryptosporidium* spp. in different water types: microscopy vs. conventional PCR

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**Statement of the Problem:** *Giardia* and *Cryptosporidium* spp. are considered as two important waterborne parasites. Their detection in the aquatic environment can be achieved by different methods, each one exhibiting advantages and disadvantages. The aim of the present investigation was to compare the *Giardia* cysts and *Cryptosporidium* oocysts water detection efficiency of the immunofluorescence assay (IFA) and the conventional polymerase chain reaction (PCR), in order to bring contribution in the developing and/or improvement of effective identification methods in monitoring of water hygiene for both pathogens.

**Methodology & Theoretical Orientation:** 140 different types of water samples (sewage, river, brook, lake, pond, collector channel) were collected through microfiber filtration, concentrated according to USEPA 1623 protocol and examined for the detection of *Giardia* and *Cryptosporidium* spp. through immunofluorescence microscopy and PCR techniques.

**Findings:** *Giardia* cysts were microscopically detected in 48 (34.3%) samples, while the parasite DNA was recorded in 37 (26.4%) samples. Seven (5.0%) samples showed microscopically positive results for *Cryptosporidium* oocysts, and the protozoa DNA was isolated from five (3.8%) samples. Some of the microscopically positive samples showed negative PCR results and vice-versa, such that the Cohen's kappa index values, used to measure the degree of agreement between methods, were calculated as being 0.514 for *Giardia* and 0.826 for *Cryptosporidium*.

**Conclusion & Significance:** The used methods can be considered effective diagnostic techniques in water detection of *Giardia* and *Cryptosporidium* (oo) cysts, and their complementary usage offer a promising tool in the monitoring of aquatic environment pollution for both pathogens.

### Biography

Kálmán Imre has the most important scientific achievements in the study of the genus *Cryptosporidium*. His research activity covers a wide variety of epidemiologic surveys and diagnostic methods including microscopic, immunologic and molecular tools. Mainly, the investigations were focused on environmental biology of *Cryptosporidium* species, molecular epidemiology, diagnosis and treatment of cryptosporidiosis in farm animals and humans from western Romania, with important contributions to the understandings of the complex puzzle of this zoonotic disease.

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