New system for higher recovery rate of water borne Cryptosporidium oocysts and Giardia cysts - DTU Orbit (16/12/2018)

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Background:
The two most common water borne pathogenic protozoa, Cryptosporidium and Giardia, cause diarrhea worldwide. Detecting these parasites in water samples depends on effective parasite recovery from the water matrix. The reported low recovery rates of the currently used filter methods motivate the development of systems with higher recovery rates.

Materials and methods:
Five replicates of IMS purified Cryptosporidium oocysts and Giardia cysts (N=2x10^3) were injected into a specially coated filter unit with a carefully chosen pore size. Following filtration, sonication was performed at predetermined time intervals to loosen all parasites and other particles from the filter and break up clusters. The concentrated parasite suspension was backwashed and counted after immuno-fluorescence staining.

Results and discussion:
Without sonication the recovery rates of both Cryptosporidium and Giardia were <10%. However, recovery rates >85% were recorded when the filter was sonicated. Sonication usually affects parasite viability but could be tuned into a useful tool for enhanced backwash collection of parasites using a specially constructed filter unit and a sonication protocol. The filtration chamber further facilitated the concentration of parasites by ensuring a backwash volume of less than 1ml. The presented design of the filter system can be used as a cheap and time effective method of isolating water borne parasites in the laboratory.

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