Longevity of *Cryptosporidium* oocysts in fresh and sea water at environmental temperatures.

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Introduction

Cryptosporidium **has been associated with waterborne outbreaks in many countries. The capacity of this microorganism to produce oocysts extremely resistant to environmental factors and conventional drinking water disinfection has facilitated its ability to spread and cause illness. Worldwide, *Cryptosporidium* oocysts have been found in groundwater, lakes, rivers, estuaries and seawater.**

Objective: To evaluate the survival of *Cryptosporidium* oocysts in freshwater and seawater at environmental temperatures .

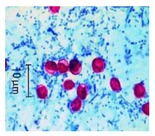
Methods

Water samples: freshwater (collected from the Laguna Setubal, Santa Fe, Argentina) and artificial seawater (salinity: 35 ppt).

Concentration of *Cryptosporidium* oocysts:

Age: 1- 60 days

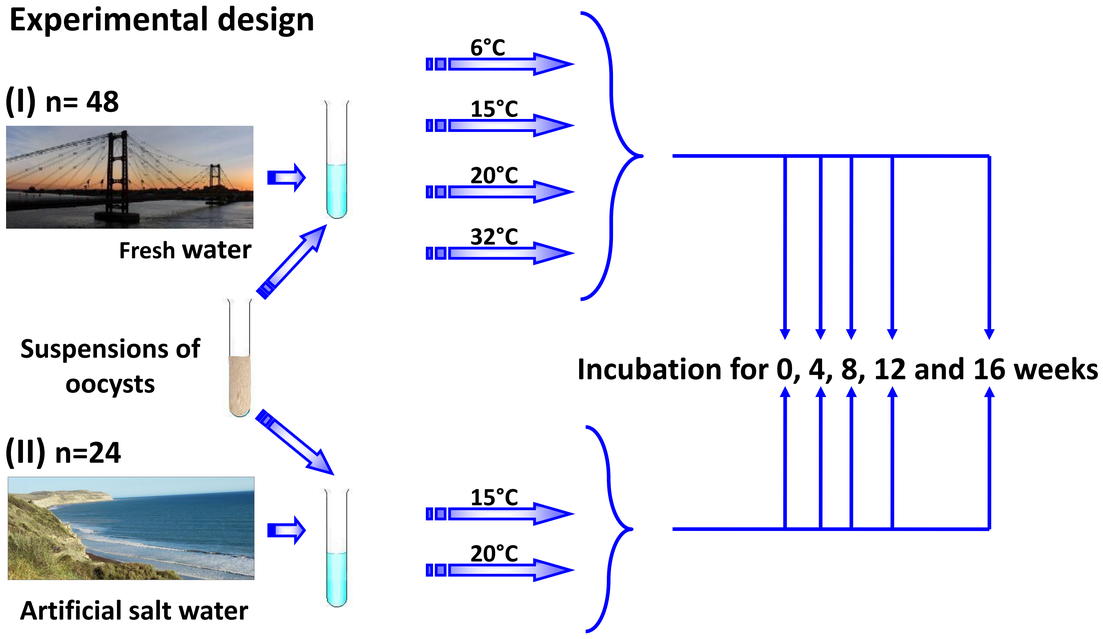
Purification: Sheather´s flotation method



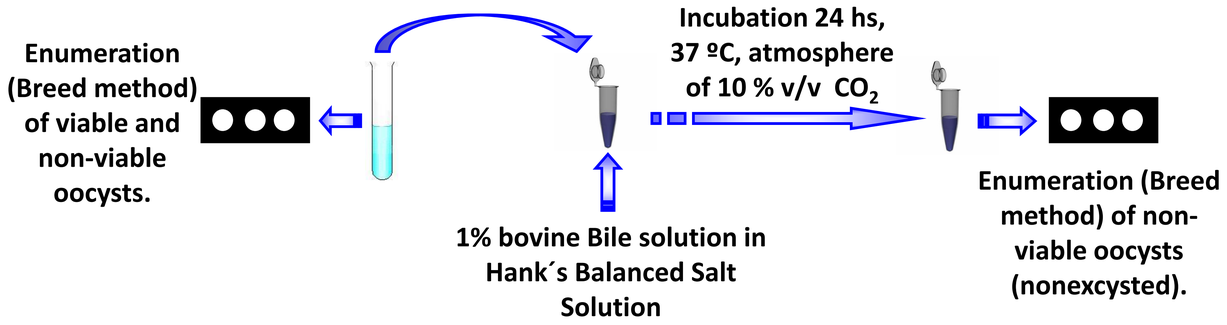
ID: Kinyoun method

Suspensions of oocysts (10^6 oocysts /mL distilled water)

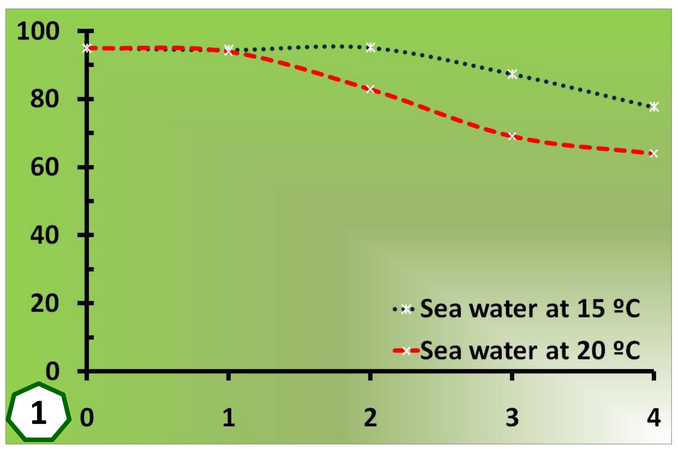
Experimental design

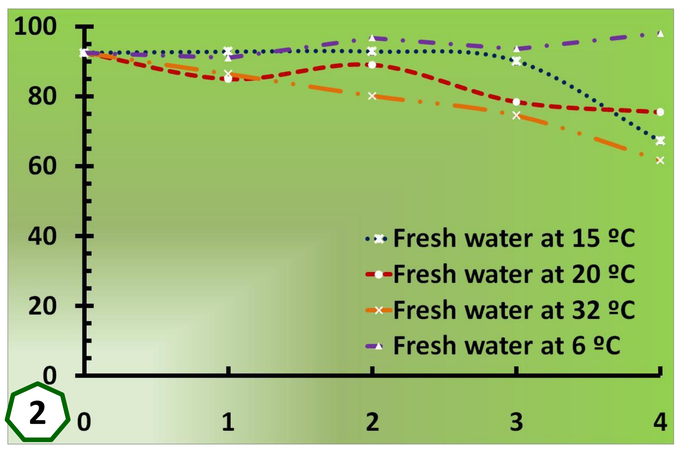


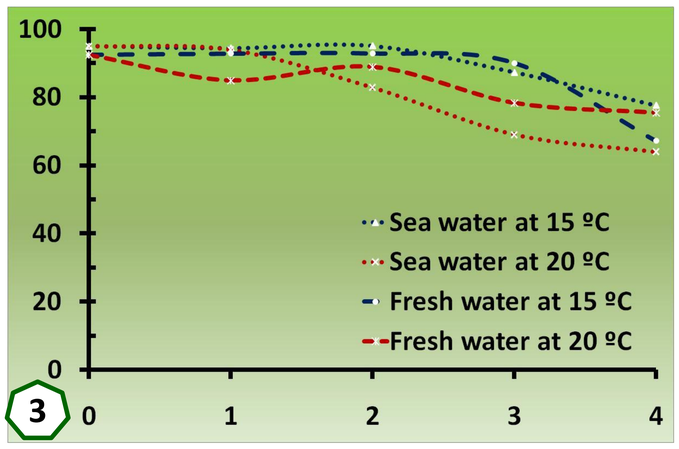
Evaluation of *Cryptosporidium* oocyst viability: in vitro excystation



Results







The oocyst survival decreased with increasing temperature (FIG. 1 and FIG. 2).

Although there was a significant increase in the percentage of dead oocysts ($p<0.001$), a large proportion survived in the test waters for 16 weeks (30.7%±4.1% in freshwater at 32°C and 28.6±9.79% in seawater at 20°C).

No difference was found between the viability of oocysts in fresh and sea water at the same temperature (FIG. 3).

1. **FIG. 1: Comparison of viability of oocysts in sea water at 15 and 20 ºC ($p=0.003$).**
2. **FIG. 2: Comparison of viability of oocysts in fresh water at 6, 15, 20, and 32 ºC ($p<0.001$).**
3. **FIG. 3: Comparison of viability of oocysts in sea and fresh water at 15 and 20 ºC ($p>0.05$).**

Conclusions

Oocysts demonstrated longevity in all water types investigated. Temperature appears to be the main factor affecting the viability of *Cryptosporidium* oocysts in fresh and marine environmental waters.

Literature cited

Modini, LB; Lerman, B; Pizarro, AV; Zerbatto, MG (2016). Interciencia, 41(3): 171-176.

Peng, X; Murphy, T; Holden, NM (2008) Appl. Environ. Microbiol, 74 (23): 7101-7107.