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ENVIRONMENTAL FACTORS AFFECTING  
ENCYSTMENT OF P.F.L.A. TOGETHER  
WITH DISINFECTION STUDIES

A thesis presented in partial  
fulfilment of the requirements for the  
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## ABSTRACT

Free living amoebae from the genera Naegleria and Acanthamoeba have been implicated in fatal and several non-fatal infections of the human central nervous system, and other organs. They can be isolated from a worldwide range of environments. The common occurrence of these organisms in nature may be attributed to the ability to form resistant cysts to withstand adverse environmental conditions.

Research was performed to determine factors that will promote the encystment of amoebae, particularly Naegleria species. The parameters examined for the induction of encystment were: the type of substrate amoebae were growing on liquid or solid, the presence of bacteria, the cell concentration and nutrient availability and incubation at temperatures other than the optimal growth temperature.

Higher percentages of amoebae encysted on solid surface environments in comparison to the liquid media. In liquid media a greater percentage of trophozoites only formed a pre-encystment or roundform stage. The factor required for the complete encystment of roundforms was not present.

The encystment of Naegleria fowleri was not significantly influenced by the presence or absence of the bacterial species used (E. cloacae).

Encystment of Naegleria sp at different cell concentrations, using a nutrient media, a soil extract broth and a non-nutrient media was examined. Complete encystment of cells did not occur where nutrients were either high or absent, and the cell concentration was low.

The ability of trophozoites of N. fowleri, N. gruberi, A. culbertsoni, and A. castellanii to encyst at a range of temperatures from 4°C - 44°C was studied. The trophozoites of Acanthamoeba sp could encyst over a wider temperature range in comparison to the trophozoites of Naegleria sp.

The effect of disinfection using Baquacil was studied. Previously isolated strains of baquacil resistant N. fowleri, still had higher disinfection survival rates compared to sensitive strains. Resistance of trophozoites to Baquacil was not affected even after storage as a cyst. Baquacil resistant strains of N. fowleri were still sensitive to chlorination.

Disinfection of amoebic cysts using chlorine and Baquacil was investigated. Amoebic cysts require higher levels of disinfection for inactivation in comparison to trophozoites. Acanthamoeba cysts have a greater tolerance to chlorination than Naegleria sp.



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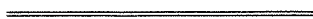


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