

Molecular Detection of *Naegleria fowleri* and Fecal Indicator Bacteria in Brackish Water of Lake Pontchartrain, Louisiana

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Abstract : Brackish water samples from Lake Pontchartrain in Louisiana were assessed for the presence of pathogenic amoeba *Naegleria fowleri*, which causes primary amoebic meningoencephalitis (PAM). In our study, quantitative polymerase chain reaction (qPCR) methods were used to determine *N. fowleri*, *E. coli*, and *Enterococcus* in water collected from Lake Pontchartrain. A total of 158 water samples were analyzed over the 10-month sampling period. Statistically significant positive correlation between water temperature and *N. fowleri* concentration was observed. *N. fowleri* target sequence was detected at 35.4% (56/158) of the water samples from ten sites around the Lake ranged from 11.6 GC/100 ml water to 457.8 GC/100 ml water. A single factor (ANOVA) analysis shows the average concentration of *N. fowleri* in summer (119.8 GC/100 ml) was significantly higher than in winter (58.6 GC/100 ml) ($p < 0.01$). Statistically significant positive correlations were found between *N. fowleri* and qPCR *E. coli* results and *N. fowleri* and colilert *E. coli* (culture method), respectively. A weak positive correlation between *E. coli* and *Enterococcus* was observed from both qPCR ($r = 0.27$, $p < 0.05$) and culture based method ($r = 0.52$, $p < 0.05$). Meanwhile, significant positive correlation between qPCR and culture based methods for *E. coli* ($r = 0.30$, $p < 0.05$) and *Enterococcus* concentration was observed ($r = 0.26$, $p < 0.05$), respectively. Future research is needed to determine whether sediment is a source of *N. fowleri* found in the water column.

Keywords : brackish water, *Escherichia coli*, *Enterococcus*, *Naegleria fowleri*, primary amoebic meningoencephalitis (PAM), qPCR

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