Biotechnological analysis of fresh water from the Manatí River

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PURPOSE: The superficial waters of Puerto Rico are generally of poor quality because of sanitary, agriculture, and industrial discharges. We have used classical and biotechnological tools, to evaluate the water quality at the initial segment of the hydrographic basin of Rio Grande of Manatí. A molecular characterization and quantification of bacteria of the genus *Enterococcus spp*, have been accomplished as an alternative for a fast and specific diagnostic tool of possible contamination with fecal matter in fresh water. **DESIGN METHODS:** A collection of samples was taken from five stations during two time periods of five weeks. Physical, chemical, and microbiological analyses were performed in samples from the Rio Grande of Manatí. DNA was extracted and an analysis of coliforms and *Enterococcus spp* was made using micro-filtration by membranes and selective culture media. The strains *Enterococcus faecalis* (ATCC 29212) and *Enterococcus faecium* (ATCC 35667) were used as controls. To generate a standard curve for real-time PCR, the DNA was extracted from different bacterial dilutions. The C_T values at the different dilution points were used to calculate the number of bacteria. **RESULTS:** High content of bacteria that indicates fecal contamination was found. Microbiological and molecular analyses demonstrated positive results for *Enterococcus faecalis* and *Enterococcus faecium*. **CONCLUSION:** The bacteriological analysis of coliforms and *Enterococcus spp.* reflected that the segment under study does not comply with the standards of quality of the Environmental Quality Board and the Environmental Protection Agency. We demonstrated that PCR can be used to identify and quantify *Enterococcus spp*.