INDICATOR BACTERIAL SOURCE TRACKING IN SELECTED BODIES OF WATER IN NORTHEAST TEXAS

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Abstract - Water is the most basic natural resource. No life form on earth can survive without water. Continuous water monitoring for indicator bacteria is very important for compliance with the government standards and in the interest of public. Fecal contamination of water influences many water bodies in Texas and many other regions in the United States. The state of Texas, in concert with federal Clean Water Act (CWA), has established standards that protect the purposes for which the water bodies will be used and defined measurements that will assure the quality of water to attain those uses. Total and fecal coliforms have been bacterial indicator of water since 1920s. Total coliforms in general are not particularly useful in terms of establishing human health risks because they also can be found in soil and plants naturally. Fecal coliforms, a subgroup of total coliforms, are considered a more useful indicator of human health risks, and are widely used to test recreational waterways. In this regard, we have examined12 sites of water bodies in northeast Texas during the summer recreational season. Water samples were collected weekly and analyzed for fecal coliforms using membrane filtration technique. Antibiotic resistance analysis (ARA) was performed on selected isolates using commonly used antibiotics by disc diffusion method. Our data showed that all the samples were positive for fecal coliform and about 25% exceeded the USEPA and Texas surface water quality standards. ARA of the samples recovered from the water indicated that about 10% of the isolates were resistant to commonly used antibiotics used by human or domestic animals. The water bodies that had exceeding number of coliform and antibiotic resistant bacteria were all heavily or moderately used for recreational purposes during the study period. These results indicate that there is a relationship between impaired microbiological water quality and human use of water.

Keywords - Water Quality; Fecal coliform; Membrane filtration.