The Influence of Pollution on the Bacterial Diversity in Dams

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Dams in metropolitan areas provide reliable water sources for high populations of human inhabitants. However, water stored in dams is subject to various threats such as elevated bacterial pollution levels and very little is known regarding the ecology of South African dams. The bacterial community structure of three dams in the Gauteng region of South Africa. We anticipated that high pollution levels would lead to equally elevated bacterial diversity. To assess this, we collected water samples form three different dams. Metagenomic DNA extractions were performed and the resultant nucleic acids were visualised through Agarose Gel Electrophoresis. Polymerase Chain Reaction (PCR) of the 16S ribosomalRNA gene, a phylogenetic marker in all bacteria, followed by Terminal Restriction Fragment Length Polymorphism (TRFLP) was conducted to differentiate the bacterial communities. The resulting electropherogram was analysed using Gene Mapper 4.1. Statistical analysis, using the Vegan Package in R, was used to construct a venn diagram and a non-metric Multidimensional Scaling Ordination Plot to assess community structure. Our results reveal a relationship between bacterial diversity patterns and pollution concentration on dams. We found that bacterial diversity is inversely proportional to pollution levels. In conclusion, our hypothesis was not supported. Additional research shows the possibility that increased pollution may lead to potentially pathogenic bacteria outcompeting more benign phylotypes.

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