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Isolation of environmental bacteria from surface and drinking water in Mafikeng, South Africa and characterization using their antibiotic resistance profiles

Suma George Mulamattathil
University of Limpopo, South Africa

The aim of this study was to isolate and identify environmental bacteria from various water sources as well as water from the drinking water distributions system in Mafikeng to determine their antibiotic resistance profiles and presence virulence factors. Water samples from five different sites were collected and analyzed for the presence of fecal coliforms, total coliforms, heterotrophic plate count (HPC), *Aeromonas* and *Pseudomonas* species using selective media. Antibiotic susceptibility tests were performed using Kirby-Bauer disk diffusion method. Cluster analysis based on the antibiotic inhibition zone diameter data of different organisms isolated from different sites was determined and was expressed as dendograms using Wards algorithm and Euclidean distance of Statistical version 7. Specific PCR was used to determine the identities of presumptive *Pseudomonas* and *Aeromonas* species through amplification of the gyrB, toxA and the ecfX gene fragments. Virulence gene determinants for the confirmed Pseudomonas and Aeromonas species were detected by amplifying the *exoA, exoS and exoT* genes and the *aerA* and *hylH* gene fragments, respectively. The susceptibility of these isolates was tested against 11 antibiotics of clinical interest and the multiple antibiotic resistance (MAR) patterns were compiled. The most prevalent antibiotic resistance phenotype observed was KF-AP-C-E-OT-K-TM-A. All isolates from all samples were susceptible to ciprofloxacin. However, all fecal coliforms and *Pseudomonas* spp. were susceptible to neomycin and streptomycin. On the contrary all organisms tested were resistant to erythromycin (100%) trimethoprim and amoxycillin. The highest prevalence of antibiotic resistant isolates was observed in Modimola Dam and Molopo eye.

Biography

Suma George Mulamattathil has completed her PhD from North West University in South Africa. Presently she is working as a Senior Lecturer in University of Limpopo, South Africa. She has published four papers and all of them deal with the antibiotic resistance of bacterial isolates from water.

Suma.Mulamattathil@ul.ac.za

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