

Identification and Characterization of Heavy Metal Resistant Bacteria from the Klip River

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Abstract : Pollution of the Klip River has caused microorganisms inhabiting it to develop protective survival mechanisms. This study isolated and characterized the heavy metal resistant bacteria in the Klip River. Water and sediment samples were collected from six sites along the course of the river. The pH, turbidity, salinity, temperature and dissolved oxygen were measured in-situ. The concentrations of six heavy metals (Cd, Cu, Fe, Ni, Pb, and Zn) of the water samples were determined by atomic absorption spectroscopy. Biochemical and antibiotic profiles of the isolates were assessed using the API 20E® and Kirby Bauer Method. Growth studies were carried out using spectrophotometric methods. The isolates were identified using 16SrDNA sequencing. The uppermost part of the Klip River with the lowest pH had the highest levels of heavy metals. Turbidity, salinity and specific conductivity increased measurably at Site 4 (Henley on Klip Weir). MIC tests showed that 16 isolates exhibited high iron and lead resistance. Antibiotic susceptibility tests revealed that the isolates exhibited multi-tolerances to drugs such as tetracycline, ampicillin, and amoxicillin.

Keywords : Klip River, heavy metals, resistance, 16SrDNA

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