

3rd International Congress on

Bacteriology and Infectious Diseases

August 04-06, 2015 Valencia, Spain

Isolation and Identification of potential PAH degrading Bacterial Species from the Diep- and Plankenburg Rivers, Western Cape, South Africa

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Polycyclic Aromatic Hydrocarbons have been shown to be carcinogenic, teratogenic and mutagenic. PAHs can enter environmental matrices via natural and anthropogenic sources from agricultural and industrial activities. The aim of this study was to isolate and identify potential PAH-degrading microorganisms from the Diep- and Plankenburg Rivers, Western Cape, South Africa. Water and sediment samples were collected monthly over a six month period at six sampling points (three sampling points along each of the Rivers) and kept on ice at 4 °C during transport.

For phenotypic identification, standard cultivation on various general and selective media, including Nutrient and *Aeromonas* isolation agars, as well as *Pseudomonas*-isolation Agar Base, amongst others, were employed. Each isolate was screened for PAH degradation (acenaphthene, fluorene) using shaking flasks prior to isolation and identification. After screening and cultivation, nineteen isolates were selected and molecularly identified using 16S rRNA extraction followed by primer-specific PCR amplification.

The predominant species identified included *Raoutella ornithinolytica*, *Serratia marcescens*, *Bacillus megaterium* and *Aeromonas hydrophila*. *Raoutella ornithinolytica* was isolated from most of the media utilised, including *Pseudomonas* Agar Base supplemented with CFC and *Pseudomonas* Agar Base supplemented with CN, while *Aeromonas hydrophila* grew on all culture media except *Pseudomonas* Agar Base. *Raoutella ornithinolytica* is a member of the *Enterobacteriaceae* while *Aeromonas* sp. closely resembles *Enterobacteriaceae*, which could account for its growth on most media. Bacterial species that display tolerance to these compounds could have great beneficial effects in the area of bioremediation of PAH-contaminated sites.

Biography

Vanessa Jackson completed her PhD at the age of 32 years from the Cape Peninsula University of Technology, Cape Town, South Africa. She is currently a senior lecturer in the Biotechnology Programme in the Department of Biotechnology and Consumer Science and is co-pi of the Bioresource Engineering Research Group (BioERG) at the Cape Peninsula University of Technology. She has published 12 peer-reviewed accredited scientific publications as both main and co-author and is supervising several Masters and PhD students.

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