PRINT: ISSN 0970-9274 ONLINE: ISSN 2456-6608
JOURNAL OF HUMAN ECOLOGY
International Interdisciplinary Journal of Man-Environment Relationship

PRINT: ISSN 0970-9274 ONLINE: ISSN 2456-6608
J Hum Ecol, 47(1): 45-63 (2014)
DOI: 10.31901/24566608.2014/47.1.06

Screening of Endophytic Bacteria towards the Development of Cottage Industry: An *in Vitro* Study

Lubanza Ngoma*, Keneilwe Mogatlanyane and Olubukola Oluranti Babalola

Department of Biological Sciences, School of Environmental and Health Sciences, Faculty of Agriculture, Science and Technology, North-West University, Mafikeng Campus, Private Bag X2046, Mmabatho 2735, South Africa

KEYWORDS Endophytic Bacteria. 16S-rDNA. PGPR Activities. Seed Germination

ABSTRACT Discovery of novel technology which use beneficial endophytic bacteria associated with the root of *Sorghum bicolor*, *Spinacia oleracea*, and *Zea mays* was researched. Total of 23 endophytic bacteria were characterized on the basis biochemical analysis and plant growth-promoting traits. Results showed that Gram-negative (60.8%) were isolated more frequently than Gram-positive bacteria (39.1%). Approximately 65.2% were motile and the remaining 34.7% were non-motile. Eleven isolates were able to produce indole acetic (IAA) (0.15-2.84 mgl^{-1}). Eleven isolates showed the ability to produce ammonium. Hydrogen cyanide (HCN) production was observed in 10 isolates. It was observed that 16 isolates solubilized insoluble phosphates in Pikovskya plates (8-60.5%). All the isolates tested were active against *Fusarium oxysporum*. Therefore, following these tests it can be concluded that 11 isolates exhibited differences and they were subjected to partial 16S-rDNA gene sequencing using polymerase chain reaction for phylogenetic analysis. MEGA 5.10 package was used to identify the following isolated bacteria: *Pseudomonas* sp. (KC010520), *Ochrobactrum intermedium* (KC010521), *Ochrobactrum intermedium* (KC010522), *Ochrobactrum anthropi* (KC010523), *Ochrobactrum anthropi* (KC010524) *Ochrobactrum* sp TOA62, and *Ochrobactrum* sp TOA64. Inoculation of *Zea mays* seeds with the identified bacterial showed a good level of germination (66%) compared to the control (44%).