

International Conference on

# ENVIRONMENTAL MICROBIOLOGY & MICROBIAL ECOLOGY

&

International Conference on

# ECOLOGY, ECOSYSTEMS & CONSERVATION BIOLOGY

July 11-12, 2018 | Toronto, Canada

## Assessment of top soils for mcpa utilizing bacteria isolated from oil palm plantation and open dumpsite

Bello Osagie IO, Ekhaise FO and Obayagbona ON  
University of Benin, Nigeria

**Statement of the Problem:** MCPA (4-Chloro-2-Methylphenoxyacetic acid), one of the organochlorine herbicides is widely used in agriculture for weed control in crops and pastures. Though it has contributed immensely in boosting agricultural produce, its accumulation in the soil may pose potential environmental and health hazards. This work attempts to evaluate the biodegradative potentials of indigenous MCPA utilizing bacteria in top soils of oil palm plantation and open dumpsite as a natural way to control toxic accumulation of MCPA.

**Methodology and Theoretical Orientation:** Standard bacteriological methods were utilized in the isolation of heterotrophic bacterial flora, physico-chemical procedures were used for the evaluation of soil profile while molecular techniques targeting the 16S rRNA of isolates were utilized in characterization of MCPA utilizing bacteria.

**Findings:** The mean total bacterial counts from the sampled sites were not significantly different ( $P > 0.05$ ). The growth profile of the axenic and the mixed bacterial cultures were evaluated using parameters such as pH, optical density, chloride release and bacterial count for 15 days. Of the Six (6) bacterial species characterized as *Bacillus atropheus*, *B. pumilis*, *B. licheniformis*, *B. subtilis*, *Achromobacter xylosoxidans* and *Pseudomonas mendocina*, only three (3) species (*Bacillus licheniformis*, *Achromobacter xylosoxidans* and *Pseudomonas mendocina*) exhibited biodegradative potential for MCPA in the soil samples. Physico-chemical analysis of soil samples revealed slightly acidic (5.2-6.9) and sandy (89.0-95.0) profile, with ammonia-nitrogen and phosphate values ranging from 6.12 mg/kg to 17.80 mg/kg and 19.09 mg/kg to 56.23 mg/kg respectively. The biodegradation of MCPA was greatly enhanced with the use of consortium of the isolates as indicated by the comparatively higher values of mean colony counts and chloride release recorded in flasks which contained glucose as extra energy and carbon source.

### Biography

Idowu Bello-Osagie is a Lecturer in the Department of Microbiology, Faculty of Life sciences, University of Benin. Her research interest spans the Environmental sector of Microbiology with focus on water quality, management and technology. She has worked extensively on biodegradation and enhanced remediation of endocrine disrupting compounds (bisphenol A) as well as herbicide degrading bacteria. She has evaluated the ecological implications of anthropogenic pollutants in soil and aquatic ecosystems as well as antibiograms and mutagenicity assessment of hospital waste water. Hundreds of students have been positively mentored over years of serving as academic advisor and teacher. She has actively participated in various local, national and international conferences, presenting scientific papers as necessary.

idowu.bello-osagie@uniben.edu

### Notes: