

17th International Conference on

Environmental Toxicology and Ecological Risk Assessment

&

36th International Conference on

Environmental Chemistry & Water Resource Management

September 24-25, 2018 | Chicago, USA

The use of magnetic biochar as a viable assay for microbial community dynamics study in a hydrocarbon contaminated soil environment

Adeolu Bayode

Teesside University Middlesbrough, United Kingdom

The ability of biochar (BC) to increase microbial abundance and activities has been linked with its influence on microbial community structure through its water retention capacity, improved aeration, high surface area and porosity. Therefore, the positive impact of biochar on crop yields is in part due to the alterations in microbial community structure. However, the mechanism through which biochar impacts microbial dynamics remains ambiguous. This study focuses on assessing the use of magnetic biochar as a viable assay for microbial community dynamics study. Magnetic biochar samples were made by pyrolysis (600°C) of cassava (*Manihot esculenta Crantz*) that had been pre-treated with ferric and ferrous chloride solutions. The impact of biochar with three different levels of magnetism was compared against non-magnetic biochar control across a 21-day destructive sampling period in minimal salt medium and in the presence of 5 mM *o*-xylene. Microbial ecology was measured by DGGE. The number of effective taxa (⁰D) (species richness) is least affected by the lowest level of magnetism and, in all cases, decreases after day 7, relative to control. A similar trend is shown by diversity index ²D (inverse Simpson's index). The ability of magnetic biochar to be separated from non-magnetic media was subsequently used to probe the extent of microbial ecological changes associated with the biochar surfaces and with the matrix to which the biochar is added. In the systems studied, the major changes in microbial ecology occur on the biochar surfaces. In conclusion, biochar produced with carefully selected levels of magnetism is a useful probe of biochar-induced changes to soil microbial ecology.

Biography

Adeolu Bayode is a final year PhD research student of the Department of Environmental Science at Teesside university Middlesbrough, the United Kingdom with a background in microbiology and biotechnology. He is working on a project which focusses on developing an assay for microbial ecology dynamics study.

a.bayode@tees.ac.uk

Notes: