

Joint Conference

International Conference on

ENVIRONMENTAL MICROBIOLOGY AND MICROBIAL ECOLOGY

&

International Conference on

ECOLOGY AND ECOSYSTEMS

September 18-20, 2017 Toronto, Canada

Effects of bacterial inoculants on soil microbiomes and biodegradation in hydrocarbon contaminated soils**Coppotelli B M**

Center for Research and Development in Industrial Fermentation (CINDEFI) La Plata, Argentina

Over the years, we have collected different bacterial strains belonging to *sphingomonadaceae* family, which have in common the ability to degrade PAH (polycyclic aromatic hydrocarbons). Their genomes have been fully sequenced (WGS) showing similarities in genes codifying enzymes involved in PAH degradation. All of them showed different degradation kinetics in cultures with phenanthrene as sole carbon source. These differences were confirmed when they were inoculated in soil contaminated with phenanthrene. The bioaugmentation of the strain *Sphingomonas paucimobilis* 20006FA revealed a reduction in genetic and functional diversity of soil, and the accumulation of toxic phenanthrene metabolites reducing efficiency in phenanthrene degradation. This effect was not observed when a similar experiment was performed with *Sphingobium* sp. AM strain, suggesting that despite coding for the same enzymes the genes of the strains would be regulated differently. The effect of the inoculation with strain 20006FA and *Sphingobium* sp. 22B (more resistant to C-starvation and drying conditions) on contaminated soil in a desiccation environment, suggests that strain 22B is the most suitable due to its adaptation to the usual environmental conditions. The effect of bioaugmentation with *Sphingobium* sp. AM strain on different soils microbiomes (chronically and recently contaminated soil) revealed an increase in the richness and diversity (pyrosequencing) in both contaminated microbiomes. An improvement in the elimination of phenanthrene occurred only in recently contaminated soil. In all cases, there was evidence of the establishment of the inoculants, which occurred together with the modification of the microbiome of the soils. It was verified that the establishment of an inoculant in the soil does not necessarily correlate with the increase of the desired catabolic capacities, in our case the degradation of PAH, because it could have been established in function of other resources. We have observed that efficiency of an inoculant in soil is not directly related to its genetic potential but to other physiological properties, which could be translated in a distinctive environmental behavior.

Biography

Coppotelli B M has her expertise in microbial bioremediation and passion in contributing to environmental care. Her studies on hydrocarbon degrading bacterial strains and consortia have contributed to the world of microbial ecology, getting insight into ecology that drives bacterial communities in response to inoculation and biochemical processes of contaminant elimination in soils and sediments and interactions among bacterial community members. It allows contributing our understanding and helping in designing appropriate management and cleanup of contaminated ecosystems.

bibicoppotelli@gmail.com

Notes: