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Tracking microbial potential of degrading polycyclic aromatic hydrocarbons, by CG-MS and qPCR

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The bioremediation of hydrocarbon-contaminated environments involves management of both biotic and abiotic factors, such as aeration, pH, addition of nutrients, temperature, etc. Regarding soil bioremediation, previous studies showed that low cost practices including aeration and setting soil pH to 7.0, can stimulate the soil microbiota to degrade hydrocarbons. Petrochemical oily sludge is a dangerous waste generated by petroleum refinery, and its accidental spill into the natural environment (soil, ocean, rivers) causes injury to animals and humans, although for some bacteria it is no more than nutrients. It happens due to a huge genetic diversity that allows bacteria to degrade xenobiotic molecules throughout a large set of metabolic pathways. Considering it, why do not take advantage of this natural process? The study of bacteria that are able to degrade oily sludge quicker can help on managing environmental issues, through biodegradation and detoxification of toxic molecules. Hydrocarbon biodegradation research have increased due to GC-MS and advanced molecular biology approaches. The aims of this study were to evaluate the potential of a *Bacillus cereus* to degrade PAHs in vitro beneath three oily sludge concentration (0%, 1%, and 6%), and also, point out the metabolic pathways involved in the process. 34 metabolites involved with PAHs biodegradation were measured by CG-MS. It was detected that *Bacillus cereus* inoculation reduced about 70% of the oily sludge's PAHs added initially. This knowledge allows the selection of optimal biotic and abiotic condition to enhance controlled bioremediation processes.

Biography

Patricia Dorr de Quadros has completed his PhD in Soil Science from Federal University of RS / UFRGS (Brazil) and University of Florida (USA), where studied soil microbial diversity and abundance of different environments, including agricultural soils from Everglades/FL and Brazil, and degraded soils after coal mining. She has 4 years of postdoctoral study on fuels biodeterioration and oily sludge biodegradation, having published more than 15 papers in reputed journals. In February 2017, she started a postdoctoral research in the University of Toronto / CA, about phytoremediation of hydrocarbon contaminated soils (natural oil soaked soils).

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