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Application of microcosms results in bioremediation of sludge farm soil from a petrochemical WWTP

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Activated sludge is the most common technology used in Waste Water Treatment Plants (WWTP) around the world. Despite being highly effective, it is possible that recalcitrant compounds, like polyaromatic hydrocarbons, accumulate on exceeding sludge. In the Brazilian Third Petrochemical Plant, surplus sludge is disposed in soils of sludge farms. To evaluate management possibilities for this soil, microbial activity was monitored in microcosms during 60 days with different treatments after contamination using benzo(a)pyrene (15 mg/kg), phenanthrene and naphtalene (30 mg/kg each). Soil pH was adjusted to 7.0, and the humidity to the field capacity. The treatments were Natural Attenuation (aeration every 3 days); Bioaugmentation (PAH-degrading *Burkholderia* isolated from Sludge) once or every 20 days; Biostimulation alone or with Bioaugmentation; Controls without contaminants. Microbial activity (soil respiration) was measured via quantification of CO^2 released in the process. The highest metabolic activity was found in Natural Attenuation (results similar to those in bioaugmentation either once or every 20 days), considering it undergoes continuous bioaugmentation, as the sludge surplus disposed there is composed mainly of microorganisms already adapted to petrochemical waste. We should point out this management is feasible requiring only liming and soil aeration. Therefore, we are testing this method *in situ* using three one m^2 areas within the sludge farm. Just after sludge application, pH was adjusted and soil was mechanically aerated in two areas, leaving one as control. Analysis of oils and grease, total petroleum hydrocarbons and genomic microbial identification are being done to compare the treatments and evaluate microbial dynamics.

Biography

Victor Hugo Valiati has completed his PhD at Universidade Federal do Rio Grande do Sul, Brazil, and Postdoctoral studies on Evolution of P Transposable Elements in *Drosophila* at University of Arizona, Tucson, United States. He is the Head of the Graduate Degree Program in Biology at UNISINOS, a Brazilian Jesuit University. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member.

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