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Isolation of four PAH-degrading *Burkholderia* strains from activated sludge in a petrochemical WWTP

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Polycyclic Aromatic Hydrocarbons (PAH) are among the most persistent pollutants of petroleum by-products. Strategies to study potential biodegradation of these compounds include evaluation of microbial diversity in contaminated areas, the study of gene families involved in aromatic ring-cleavage and isolation of indigenous bacteria. In this work, an enrichment technique with benzo(a)pyrene or naphthalene as sole carbon sources was used to isolate bacteria from activated sludge from a petrochemical Waste Water Treatment Plant (WWTP). Four *Burkholderia* strains from 3 different species (*B. cenocepacia*, *B. vietnamiensis* and *B. multivorans*) were identified using biochemical and molecular methods. Partial multi-locus sequence typing allowed us to identify two new alleles (genes *recA* and *gyrB*) in two of our strains. Another strain had the same alleles as *B. vietnamiensis* G4, a model strain for hydrocarbon degradation. As further characterization of these strains, we tested their ability to reduce benzo(a)pyrene *in vitro*. The strains were grown for 7 days, individually and in consortium, in minimal media containing benzo(a)pyrene as sole source of carbon; *B. vietnamiensis* G4 strain was also tested. While there was no statistical difference among the WWTP isolated strains and the control when they were cultivated individually, the consortium with four strains showed a reduction in 8.6% of benzo(a)pyrene related to the control, similar to G4 strain (9%). Since we found indigenous strains with efficiency comparable to the model G4 strain, these results highlight the potential of the WWTP isolated strains to be used in bioremediation of the contaminated area.

Biography

Ana Lusía Leal has 16 years of experience in microbiology working in both academic and industrial environments. She is the Head of the Biology Department at the Wastewater Treatment Plant from the Brazilian Third Petrochemical Plant, monitoring the quality of the treatment process and finding solutions to operational and environmental problems.

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