TITLE: BACTERIA DOMAIN ANALYSIS OF BATH ACTIVATED SLUDGE SYSTEM TREATING LEACHATE AND DOMESTIC SEWAGE BY DGGE

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ABSTRACT:

Landfilling is still used in Brazil because it is economically viable technique. However, there are still many questions and uncertainties about the process, especially the effects of adding leachate on the biological treatment system. The efficiency of the conventional biological treatment of leachate in activated sludge systems is affected by free ammonia, which is potentially toxic to aerobic microorganisms at elevated levels (> 800 mg / L) in leachate. The blend of leachate with domestic sewage wastewater has shown good results, depending on the percentages of this mix. In this context, the aim of this work was to evaluate the alterations of the bacterial community, by means of DGGE, in treating the different percentages of domestic sewage mixture with crude and pre-treated leachate (ammonia removal in air stripping tower) and anaerobic sewage treatment effluent mixture with crude and pre-treated leachate. Similarity coefficients, diversity (Shannon) and richness (Chao1) indices corroborate the principles of general ecology. Some operational conditions turn these activated sludge reactors into less diverse eutrophic systems. The pre-treated leachate and raw sewage mixing condition showed the highest ecological indices of richness (Chao1 - 21) and diversity (Shannon - 3.01), which further confirmed by the higher efficiency of COD (82%), BOD (97%), NTK (92%) and ammoniacal N (96%) removal. However, 5% of crude leachate and anaerobic reactor effluent blend showed the worst performance of the system with the lowest Chao 1 (8) and Shannon (1.99) indices, indicating the selection of organisms adapted to the degradation conditions of organic matter. The removal efficiency of COD, BOD, NTK and ammoniacal N dropped to 26%, 5%, 55% and 56%, respectively. In addition, a significant increase in the frequency of filamentous microorganisms and disintegration of the flakes in the activated sludge system was seen.

Key words: landfilling, leachate, DGGE, domestic sewage, bath activated sludge.

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