

Comparison of the Efficiency of Microbial Populations From Urban and Industrial Activated Sludge for Hospital Wastewater Treatment

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Background & Objective: Hospitals are considered as origin for releasing pharmaceutical compounds, pathogenic microorganisms, radioactive elements, chemical disinfectants and other poisonous agents to sewage. Most of these compounds are passed unchanged through common treatment systems and along with wastewater, they enter into free environments. This can influence the biologic treatment systems and lower their efficiency significantly.

Methods: In this study, hospital wastewater were treated with active sludge from urban and industrial treatment plant. For assessment of efficiencies of activated sludge 1 day, 3 days and 5 days aeration Methods have been used. Before and after each aeration step, BOD, COD and MLSS of wastewater and sludge were determined. Biochemical test carried out to identify isolated bacteria from active sludge and the efficacy of each bacterium was assessed for hospital wastewater treatment.

Results: Reduction in BOD and COD values were influenced by urban sludge after 1,3,5 days aeration with a removing efficiency of 93.3% and 93.9% the BOD and COD reduction were influenced by industrial sludge after 1,3,5 days aeration which reached to an efficiency of 97.4 and 97.3%. Bacteria of the genus *Bacillus* and *Staphylococcus* were isolated as the dominant bacteria in urban and industrial sludges. *Bacillus subtilis* has the highest efficiency (83%) the COD reduction in industrial active sludge and *Staphylococcus saprophyticus* displayed a removal efficiency of 61% in municipal active sludge.

Conclusion: It can be concluded that the presence of these two bacteria can be more effective than other bacteria in active sludge for hospital wastewater treatment.

Keywords: Hospital Wastewater; Activated Sludge; Municipal; Dairy Industry; Microorganism