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Use of mined municipal solid waste for enrichment of anaerobic ammonium oxidising bacteria for anammox process

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Rapid population growth and urbanization has made municipal solid waste (MSW) management as need of the hour. 1 - 4% of MSW is Total Kjeldahl Nitrogen (TKN), which is primarily composed of proteins. This nitrogen gets accumulated as ammonia nitrogen in the landfill leachate by ammonification and solubilization processes. For the removal of ammonia nitrogen, the novel process like anaerobic ammonium oxidation (ANAMMOX) processes are better than conventional biological methods due to their lower requirement of carbon source, lesser nitrous oxide emissions and sludge production leading to savings in energy and resources. ANAMMOX process requires anaerobic ammonium oxidising bacteria (AnAOB). The present paper presents about the use of mined MSW for enrichment of AnAOB in fed batch reactors. The anaerobic reactor was operated for 250 days and contained 1700 g (dry weight) of mined waste containing a nitrogen concentration of 0.1 g/kg of NH₄-N. Enrichment of AnAOB was monitored by variations in nitrogen concentrations, biomass development, intermediates accumulation and free ammonia/free nitrous acid concentrations. The variations in nitrogen transformations and biomass accumulation illustrated the presence of AnAOBs growth; further AnAOB enrichment from mined MSW was proved by the occurrence of intermediates such as hydrazine and hydroxylamine.

Biography

Sri Shalini has completed PhD and Post graduation in Environmental Science from Centre for Environmental Studies, Anna University, Chennai, India. Have two years of Postdoctoral experience from Indian Institute of Technology Madras, India. Currently, Postdoctoral Scholar in McGill University, Canada. The research interests are Solid waste Management, Environmental Biology, Climate change mitigation and Bioenergy field.

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