

Biodegradation of Cicer Arietinum, an Organic Fraction of Municipal Solid Waste under Aerobic Conditions

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Abstract—Generation of large volumes of Municipal Solid Waste (MSW) due to population explosion and industrialization leads to many environmental and health hazardous problems - mainly in urban areas. Food waste take a lead role in organic part of MSW and Cicer Arietinum (Chana dal) is one of the most popular legume from list of Indian dals. Composting is a popular treatment method used by local authorities. The objective of this study was to measure the rates of biodegradability of an organic component of MSW, i.e., Chana dal, under optimum aerobic conditions and to correlate them to their physico-chemical parameters. Biodegradation of Chana dal samples was carried out under carbon limiting condition. These samples were treated using bacterial culture present in soil and kept in incubator for a period of 180 days at 35°C and the rate of degradation was observed in biotic, biotic with sodium azide control (SAC) and compared with control sample (without inoculum). Results of this study showed Total Suspended Solids removal for biotic, sodium azide control and autoclaved control samples were 91.89 %, 26.67 %, and 17.81 %, while removal of Volatile Suspended Solids were 92.96 %, 28.32 %, and 19.72 %, respectively. This indicates that higher rate of biodegradation was observed under biotic condition as compared to biotic with SAC and control samples. Addition of 100 mg/L of sodium azide inhibit biodegradation of VSS. The differences in biodegradation of sample in the biotic and control tubes demonstrate that soil seed were capable of degrading Chana dal.

Keywords: Municipal solid waste; Biodegradation; Total suspended solids; Volatile suspended solids, Soil seed;