

DECONTAMINATION OF FISH WASTE AND WATER HYACINTH MIXTURE: BATCH STUDIES.

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EXTENDED ABSTARCT

Anaerobic digestion has gained much interest as a means to reduce waste volume, meanwhile producing biogas a renewable energy source and an environmentally sound biofertilizer that usually contains little or no pathogens. The effect of anaerobic digestion on the reduction of microbial indicator organisms is studied during the operation of fish waste and water hyacinth mixture at a ratio of 1:4 parts respectively. The batch studies were operated at 30⁰C in one-liter reactors, for 21 days.

In this study, the viable numbers of total coliforms and fecal coliforms is determined at the start of the incubation period, after 10 days and at 21 days days of the experiment. The pure strains of *E.coli* were included as control during this study. The methanogenic process was monitored by determining the following chemical parameters: pH, methane content, volatile solids (VS), carbon, and nitrogen contents.

This study established the complete elimination of the control strains, and fecal coliforms from the fermentation mixture. The total coliforms were reduced by 87% during the 21 days experimentl period. The effect of anaerobic digestion at mesophilic temperature of 30⁰C was established to be effective on reducing the microbial counts. The degree of reduction among the microbes under study I coupled to the genetic differences existing among them, and the environmental conditions prevailing in the reactors. High rate of reduction of the microbes under study may be correlated to the change in pH of the fermenter contents, the absence of oxygen among other factors.

Anaerobic methanogenic fermentation has been suggested as an attractive treatment process, since it is effective in decreasing the counts of pathogenic bacteria with consequently low possibilities of disease transmission and at the same time producing biogas, a renewable energy source (El-Bassel *et al.*, 1986). The study aimed at establishing viable counts of indicator organisms of fecal contamination and determine the presence of total coliforms, faecal coliforms, present in the digestion mixture and investigate the effect of anaerobic digestion on their survival. The results found in this study as indicated above proved the effectiveness of mesophilic anaerobic digestion process in reducing the counts of indicators of fecal contamination in the fermentation mixture. The results also found the biogas produced to be of high quality in terms of methane content where it was found to contain 73.3% (the theoretical content being about 60%). This means the process was purely operating at anaerobic conditions.

Key words: pathogens, co-digestion, biofertilizer.