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## **Influence of Inoculum - Substrate Ratio on the Anaerobic Digestion of Bagasse Based Paper Mill Effluent in Batch Process**

**P.Ravichandran\*, S.Sivaprakasam**

**Department of Civil Engineering, Annamalai University, Annamalai Nagar, Chidambaram-608002, Tamil Nadu, India**

**Abstract:**In recent years, anaerobic digestion has proved to be a more versatile in treatment of industrial wastewater. Batch digestion experiments were conducted to determine the effects of Inoculum - Substrate Ratio (ISRs) of five different ratios 0.5, 1.0, 1.5, 2.0 and 3.0 for 168 hours period. The substrate chosen in this study was bagasse based paper mill effluent. The inoculation was made by sludge issued from wastewater treatment plant. During this study, several parameters of anaerobic digestion were measured, such as pH, VFA and TA. The results obtained were demonstrated that the ISRs range from 0.5 to 3.0, the pH ranged from 6.32 to 7.2 and this parameter was always stable during the anaerobic process. In addition, within the above ISRs range the VFA/TA ratios were always lower than the failure limit value 0.5, which depicted the high stability of anaerobic digestion process in batch made. The bio gas productivity was estimated for various batches of inoculum – substrate concentration and biogas productivity was observed more as 55 ml for ISR 0.5.

**Keywords :**Anaerobic digestion; Inoculum-substrate ratio (ISR); Bagasse based Paper mill effluent;Batch process; Sludge; Process stability.