

Performance of hybrid anaerobic reactors for treatment of dairy effluent using different commercial packing media

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■ **ABSTRACT** : The anaerobic treatment process escorted with the development of several high rate reactors has earned more feasibility to cope up with the variability in effluent and its treatment against rapid rate of its production. Looking to the advantages of these high rate reactors, an attempt was made at laboratory scale to employ the benefits of both, the anaerobic fixed film reactor and upflow anaerobic sludge blanket (UASB) type reactors in a single reactor and to check whether that would yield better treatment efficiency. Two such reactors were developed following general design considerations for anaerobic fixed film reactor and UASB reactor. Two reactors were identical in every aspect but had different commercial packing media. The reactors were fed with the diluted cheese whey at different hydraulic retention time (HRT) in a semi-continuous mode. The performance data were collected and analyzed for COD removal, biogas production, specific biogas yield, specific methane yield and COD and pH profiles across the height of the reactors. The results showed that the reactors performed satisfactorily at all the HRTs with an average COD removal of up to 83 % and average specific biogas production of 0.63 l/g of COD removed at a COD load of 6800 mg/l. The reactors showed good stability against shock loadings and showed good performance at lower HRTs.

■ **KEY WORDS** : Anaerobic fixed film reactor, UAS B, Dairy effluent, Biogas, COD, Methane

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