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AN APPROACH ON ATTACHED GROWTH PROCESS FOR DOMESTIC WASTEWATER TREATMENT

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Abstract

The applications of biofilm treatment technologies for domestic wastewater are being increased in many parts of the world. The aim of the study is to assess a compacted aerobic attached growth fix-film unit (termed Bio-cache) for treatment of small volume domestic wastewater. The system consists of the miniature plastic packing matrix, which provides a large surface area of 300 m²/m³, so as to maintain the high rate growth of viable organisms responsible for organic degradation. The study on the Bio-cache was undertaken in a laboratory scale and analytical data were collected before and after treatment. This paper also investigates microbial flora present in the system by isolating and identifying the microorganisms. At the optimum hydraulic retention time (HRT) of 2 h, approximately 78% Chemical Oxygen Demand (COD), 88% Biological Oxygen Demand (BOD₅), 32% Total Dissolved Solids (TDS), 72% Total Suspended Solids (TSS), 9% Chlorides, 75% ammonia nitrogen (NH₃-N), 40% phosphate (PO₄-P), 93% most probable number (MPN) and 95% total viable count (TVC) reduction was achieved in the Bio-cache system. A comparative evaluation was done with the inferior surface fixed packing conduits and better treatment efficiency with lower wastage sludge biomass concentration was observed by the Bio-cache packed bed media. This study indicates a possibility of substantially effective attached growth system for small volume domestic wastewater treatment.

Key words: attached growth system, pack bed, hydraulic retention time, domestic wastewater treatment, sewage

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