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OPTIMIZATION OF MICROORGANISMS TO BE USED IN THE MOVING BED BIOFILM REACTORS OF A COMPACTED SEPTAGE TREATMENT PLANT THROUGH SEEDING AND ACCLIMATIZATION PROCESSES

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Abstract

This was a preliminary study conducted before using a 1.4 m³/d pilot compacted septage treatment plant. The seeding and acclimatization processes were analyzed in batch mode using domestic septage as a substrate and utilizing Kaldness media to attach and grow microorganisms. Seeding was done in a 100L plastic bucket, while acclimatization was carried out in 3 stages: first in a 100L plastic bucket, then in the plant's moving bed biofilm reactors 1 and 2, respectively. This research was conducted to ensure that the microorganisms were able to grow and adapt well within their environment by studying the time, optimum conditions required, and the growth mechanism of the microorganisms. Seeding was stopped on day 6 once the medium's color changed from white to brown, indicating the microorganisms' attachment to the media. Additionally, the Kaldness was 0.074 g heavier, reflecting biomass growth on the carrier's surface. Acclimatization was halted on day 16 once the COD reduction and fluctuation reached their optimum levels (72.7%) and stability (<10%), respectively. The larger scale of the bed reactors, compared to a laboratory model, and the use of septage will hopefully benefit this research area. The further use of this mobile, innovative technology will help overcome the increasing construction and land acquisition costs required for a conventional plant. Further research is needed to investigate the plant's efficacy with the acclimatized microorganisms.

Key words: COD, colour, Kaldness, MLVSS, weight

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