

Comparison of green and brown coconut husks as a packing material in an anaerobic filter

Summary Paper

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1 TARGET AUDIENCE

This work would be of interest to water professionals with an interest in upgrading septic tank systems. It is particularly relevant to any area where coconut husks and septic tanks are abundant.

2 BACKGROUND

Groundwater and marine pollution in the Pacific have at least partly been attributed to septic tanks which are overloaded. One potential solution is to add an anaerobic filter after the septic tank to enhance treatment. These filters need to contain material which a biofilm can attach to to treat the wastewater. Coconut husks were identified as a potential material to use in these filters.

3 PURPOSE

The purpose of this study was to evaluate the treatment performance of anaerobic filters when run under conditions typically found in the Pacific Islands, and to compare the use of green and brown coconut husks.

5 METHOD

Two continuous anaerobic filters were run using coconut husks imported from Tonga and synthetic wastewater. The two reactors compared green and brown coconut husks. Studies were also conducted to determine the amount of organic carbon, measured as chemical oxygen demand (COD), released from the green and brown coconut husks.

6 RESULTS

The performance of the reactors was influenced by two processes. COD was removed by the anaerobic microorganisms, but COD was also leached from the coconut husk itself. The green coconut husk was found to leach four times more COD than the brown husk. This meant that the green husk reactor only removed 21 % of the COD whereas the brown husk reactor removed 49 %, giving a final effluent COD concentration for the brown coconut husk reactor of 64 mg/L.

7 IMPLICATIONS FOR TARGET AUDIENCES

These results have shown that further work should be undertaken to examine the feasibility of implementing an anaerobic filter using brown coconut husks. This should involve examining any nutrient release from the coconut husks during treatment, and further trials to determine the size of the unit required for a household and establish requirements for maintenance.