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Isolation and screening of bacteria with biofilm formation ability and characterization with hydrolytic enzyme production for enhanced biogas production

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Abstract

Aims: Biofilm is a complex structure that provides protection towards the bacteria within the barrier. Enhanced biogas production from Palm Oil Mill Effluent (POME) can be achieved by applying biofilm based anaerobic digestion system.

Methodology and results: Bacteria that produces biofilm were isolated and tested on its hydrolytic enzyme secretion. The biofilm produced were also characterized. Out of 120 strains isolated from POME, PKC and food waste compost, only 33 strains were producing biofilm and only 11 of them exhibited significant amount of biofilm produced at optical density of wavelength 595 nm (> 0.01). In hydrolysis enzyme assay test, all strains were not able to secrete protease enzyme. The biofilms were extracted and characterized to show similar characteristic for all strains. Strain numbers of 11, 9C, 23C and 30C showed positive result for cellulase, amylase and lipase enzymes, to be tested as single strain bacteria and also mixed with other isolated bacterium for prospect research on effective hydrolysis towards enhanced biogas production. The composition of biofilms from different bacteria mixture also similar under the same incubation condition.

Conclusion, significance and impact of study: Bacteria producing biofilm are very limited and does not secrete the same hydrolytic enzymes. Utilization of these bacteria may eliminate the problem of microbial instability in a system.

Keywords

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KeyWords Plus: [ANAEROBIC TREATMENT](#); [PRETREATMENT](#); [DIGESTION](#)

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