Biogas Production from Different Agricultural Residues via Thermophilic Anaerobic Digestion

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ABSTRACT

With increasing population and industrialization energy demand is also rising exponentially worldwide. With the increasing energy demand and associated environmental problems arising from the exploitation of conventional sources of energy, it has shifted the energy sources from non-renewable to renewable sources. Biogas is one of the alternatives to the fossil fuels which is sustainable in respect to environmental, economic, and social dominant. Biogas is a mixture of gases i.e., methane, hydrogen, carbon dioxide, etc. produced by the anaerobic digestion of organic matter/ lignocellulosic biomass. In India, about 754.50 million tonnes of agricultural waste is generated annually, out of which 228.52 million tonnes is in surplus, which can be used as feedstock for biogas production. In the present study, the potential of different agricultural residues e.g., mustard stalk, corn cob, corn stover and banana pseudo-stem, for biogas production has been tested using a thermophilic consortium developed at SSS-NIBE at 52^{o}C. The biogas yields from mustard stalk, corn cob, corn stover and banana pseudo-stem were 131.1 L/Kg, 75.9 L/Kg, 483.15 L/Kg and 408.7 L/Kg, respectively along with 10, 15, 20, 20 days of hydraulic retention time (HRT) respectively. In this study, it is concluded that the developed consortium has great potential for biogas production with less HRT.

Keywords: Agricultural residues, Anaerobic digestion, Thermophilic consortium, Biogas.

How to Cite

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