

Biogas Production from Agricultural Waste and Its Overproduction by Electrochemical System

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Abstract : Biogas production and use in Nepal is very essential not only to combat fuel crisis but also for organic waste management. This paper deals with the integration of electrochemical systems in an anaerobic digester to enhance biogas production with minimal electrical energy input. Biogas of 1.9 L was produced from the 1:2 v/v mixture of vegetable wastes in a downward water displacement collector and 0.8 V supplemented at 27°C. Biogas could be produced even at 18°C i.e., 0.63 L), which is more than twofold in comparison with biogas produced without voltage i.e., 0.30 L). Maximum COD reduction was 70.84 ± 5.54 % than in control (20.35 ± 4.53 %). The digester is found to dwell three *Bacillus* strains and one *Exiguobacterium* strain when isolated manually from the sludge. From this study, supplementation of electricity in anaerobic digester can produce more biogas and enhance waste degradation by transforming waste into energy.

Keywords : anaerobic digestion, biogas, microbial electrolysis cell, electrochemical, methanogens

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