



P 07 Effect of market waste: Rice straw ratio on biogas production in batch reactors

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The biogas production from organic wastes is a process of producing a source of renewable energy. Rice straw (RS) can be used for biogas production with an added Nitrogen (N) source to maintain the suitable C:N ratio. The market waste (MW) which is a rich source of N can easily be combined with RS. The objective of this study was to find the proper ratio of MW:RS to maximize the biogas production. MW and RS were dried, ground to less than 1 mm particle size, and mixed in three ratios in dry matter basis (MW:RS; 1:1 (T1), 1:2(T2) and 1:3(T3)). The total solid (TS) of the mixture was adjusted to 12%. Plastic cans were used as batch reactors. Biogas production and reactor performance parameters were monitored. No gas production was observed during first few days (3-6). After first two weeks, the maximum gas amount was produced and it was gradually decreased. A significantly higher gas production was observed in T3. The total gas production (L/kg of dry matter) in T1, T2 and T3 were 12.75 (118 days), 20.50 (147 days) and 64.92 (155 days) respectively. The highest CH₄ (57.76%) and lowest CO₂ (22.95%) percentages of the gas produced were recorded in T3. Chemical oxygen demand of leachate from T3 was quite high (-20000 mg/L). The pH, Alkalinity and Volatile fatty acids of all the reactors were determined for the monitoring of the process stability. The results demonstrate that the mixing ratio of MW and RS in 1:3 can effectively be used for the enhancement of biogas production with higher methane content. However, a further study is suggested to determine the optimum mixing ratio of both wastes producing maximum amount of biogas.

Keywords: biogas, market waste, rice straw