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Biogas production potential from fallen teak leaves (*Tectona grandis*)

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Sustainable energy resources have become necessary for world stability, and biofuels may offer promising alternative energy. Recently, biomass for energy generation has attracted much attention at global and national wide. Biogas is a renewable gaseous fuel. It is generated by anaerobic digestion (AD) of organic wastes. The fallen teak leaves (*Tectona grandis*), represents an interesting substrate for biogas production. The chemical composition of leaves showed the C, H, N, S, and O content of 48.88, 5.83, 0.55, 0.18, and 30.04%, respectively. In addition, the leaves contain 3.33% moisture, 13.67 % ash, 86.33% volatile matter, and 3.33% fixed carbon, through dry weight determination. The content of total solids (TS), volatile solids (VS) and chemical oxygen demand (COD) in the leaves was measured; the results average as 982,151.93 mg/kg and 819,412.60 mg/kg and 21,333.33 mg/L, respectively. The biogas composition of carbon dioxide (43.57%) and methane (55.47%) of was estimated from the biogas. Total biogas yield was 1.0740 m³/kg or 1,073.99 L/kg achieved through theoretical estimation; and total methane yield was reached 0.5964 m³. Based on COD estimation, our study shows the fallen teak leaves biomass is a potentially valuable fermentation substrate and produce 7.467 L (0.007 m³) of methane gas. Consequently, the study results confirm that fallen teak leaves are very suitable as a substrate for biogas production.

Biography

Anongnart Wannapokin is pursuing her Master's degree in the area of biomethane production from fallen leaves and algae at Program in Biotechnology, Faculty of Science, Maejo University, Chiang Mai, Thailand. Her research interests include renewable fuels such as biogas, biodiesel, bioethanol, biochar, and biomass processing also waste management.

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