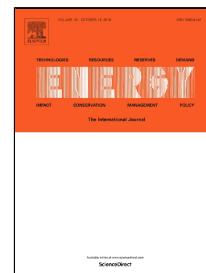


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Biogas potential from spent tea waste: A laboratory scale investigation of co-digestion with cow manure

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1 **Biogas potential from spent tea waste: A laboratory scale investigation of co-** 2 **digestion with cow manure**

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7 **Abstract**

8 Spent tea waste (STW) is an organic waste that is disposed in open land after preparation of
9 tea. Generally, it is disposed in an open land which increases anthropogenic gases. Converting
10 it into useful energy or value added product may reduce disposal problem and anthropogenic
11 activity. In this study, STW was co-digested with cow manure (CM) for obtaining biogas by
12 anaerobic digestion. For this purpose, STW was mixed with CM at different proportions,
13 namely 50:50, 40:60, 30:70, 20:80, and 0:100 percentages on a mass basis, were used in five
14 different anaerobic digesters. The samples were kept in different anaerobic digesters for the
15 study. The effect of important input parameters like pH, Carbon to Nitrogen (C/N), and
16 digestion time on the biogas production were studied. Further, the collected biogas from the
17 digesters were characterised to ensure the suitability for use as a renewable fuel. Furthermore,
18 the digested slurry was also analysed for its use in agriculture sector. The results are presented
19 in this paper.

20 **Keywords:** Spent tea waste, Cow manure, anaerobic digestion, biogas

21 **Nomenclature**

STW	Spent Tea Waste
CM	Cow Manure
AD1	Anaerobic Digester1
C/N	Carbon to Nitrogen
CH ₄	Methane
NH ₃	Ammonia
CO ₂	Carbon dioxide
H ₂ S	Hydrogen Sulphide
MSW	Municipal Solid Waste
NIT	National Institute of Technology
FTIR	Fourier Transform Infrared Spectrography
O	Oxygen
H	Hydrogen
Br	Bromine
I	Iodine
Cl	Chlorine
TS	Total Solid
VS	Volatile Solid

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