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**Biogas production and microbial community properties during anaerobic digestion of
corn stover at different temperatures**

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Abstract:

Temperature has different effects on anaerobic digestion (AD) of various biomasses, which could bring out changes in microbial communities. The relationship between microbial community and methane production at 35°C(R35), 38°C(R38), 41°C(R41), and 44°C(R44) was analyzed during AD of corn stover (CS). The results showed that the daily biogas and methane production from R44 were 16.6%-42.4% and 16.2%-40.6% higher than yields from R35, R38 and R41, respectively. The abundance of Bacteroidetes in R35, R38 and R41 was relatively close (30.70%-39.36%), which was low in R44 (16.00%). The abundance of Firmicutes in R35 was 32.30%, however, Firmicutes was the most dominant phylum at R44 (66.58%). The abundance of Miscellaneous_Crenarchaeotic_Group and Euryarchaeota were $54.63 \pm 6.47\%$ and $44.43 \pm 6.73\%$ across all digesters. This research demonstrated that among all temperatures studied, 44°C could enhance the conversion efficiency of the substrates to methane and be recommended for better conversion of CS in AD process.

Key words: Corn stover; Temperature; Anaerobic digestion; Biogas production; Microbial community

1 Introduction

Generation of renewable energy from various sustainable sources like bioorganic materials have gained high interest in recent years. When transforming organic wastes into bio-methane, AD

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