

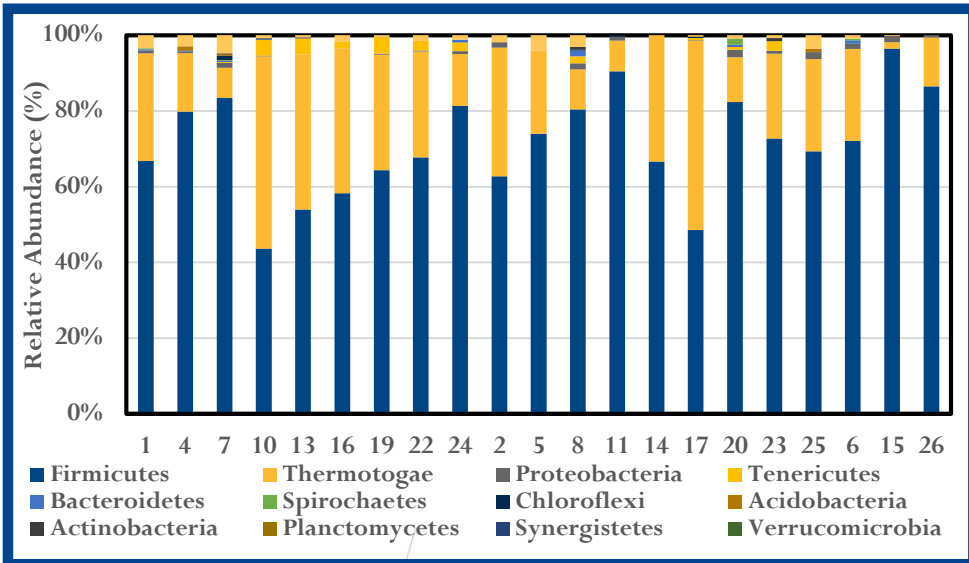


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Energy and Environmental Systems

“Study of Biogas Production Potential, Microbial Community Structure and Environmental Sustainability on Thermophilic Anaerobic Co-digestion of Animal Wastes and Lignocellulosic Biomass”

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RESEARCH QUESTIONS / PROBLEMS:

- Anaerobic digestion of plant matter, which contains complex structure, leads to low biogas production
- Microbial communities involved in the process is not well understood because of the complexity of the population and their metabolic pathways

METHODS:

- Corn stover was pre-treated with effluent for 7 days followed by anaerobic digestion with swine waste at 55°C for 21 days
- Microbial community analysis was carried out using 16S metagenomic sequencing

RESULTS / FINDINGS:

- Thermophilic pre-treatment of corn stover with effluent proved to be an efficient method to enhance the biodegradability of corn stover
- Abundance of bacterial and archaeal communities had a direct correlation with the digester performance and biogas production

SIGNIFICANCE / IMPLICATIONS:

- Anaerobic digestion of agricultural and animal wastes with proper pretreatment and control of microbial community is sustainable for management of wastes and production of biofuel