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Efficiency enhancement of anaerobic digester in microbial fuel cell through use of *R. albus*

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The current study has been undertaken to examine the beneficial effect in the power output of a microbial fuel cell (MFC) by adding cellulolytic bacteria *Ruminococcus albus (R. albus)* into the anodic chamber. Mediator-less H-type MFCs were set up where the anode chamber contained anaerobic digester microorganisms as inocula on the finely ground pine tree (Avicel) at 2% (w/v) and the cathode chamber of 10mM phosphate buffered saline conductive solution, both separated by a cation exchange membrane. The functioning of the MFCs for generation of electrical power and the amounts of gaseous byproducts was monitored over a 9 day period. The addition of cellulolytic bacteria caused an increase in average power density from 7.9mW/m^2 to 19.5mW/m^2, about 245% increase over a 9 day period. For both groups of MFCs; with *R. albus* and the control, the headspace gases collected were methane and CO_2. While the methane: CO_2 ratios were found unchanged at 1.7:1 throughout the 9 days of observation, the total gas production increased from 248mL to 319mL due to the presence of *R. albus* addition. This study confirms that whereas the biocatalytic activity of anode microbial population determines the energy production, the addition of external cellulolytic bacteria into anode microbial population can improve and extend the biomass utilization.

Biography

Diane Moon is a student of The Gwinnett School of Mathematics, Science and Technology, Lawrenceville, GA. She worked with Dr Paul S Chung in Fuzbien Technology Institute. Her research field was green energy and her research results have been published in the journal.

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