Effects of environmental factors on bioconversion of greenhouse gas methane to bio-fuel by Pseudomonas sp. Wu-S19

Kun-Wei Li, Wu Jane Yii
E-mail: jywu@mail.dyu.edu.tw

ABSTRACT
Methane is considered to be a next generation chemical feedstock because it is abundant in biogas and natural gas from anaerobic digestion system. At the same time methane is also a greenhouse gas with a global warming potential 20-30 times greater than carbon dioxide, and thus needs to be mitigated. Microbial methane oxidation can play a key role in mitigating methane as a greenhouse gas and converting methane to biofuels. To isolate a strain with high methane oxidation capability from soils and identified according to 16S rDNA gene sequences, called Pseudomonas sp. Wu-S19 (NCBI under accession number JX088028) in this study. In addition, we aimed to investigate the effects of environmental factors on bioconversion of greenhouse gas methane to biofuels by the isolated strain of Pseudomonas sp. Wu-S19. The results showed that initial pH 8 were favorable for methane oxidation and fatty acids production. The maximal methane oxidation could reach 62%, the total FAMEs (fatty acid methyl esters) content have 13% of dried cell weight of Pseudomonas sp. Wu-S19. The dominant compositions of fatty acids in lipid were saturated fatty acid: oleic acid (C18:1).

Keywords: Environmental Factors, Methane, Bioconversion

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