

P-10. Promoting Methane Gasification in Anaerobic Scum Degradation Using Microbial Community Adapted to Scum

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To promote anaerobic scum decomposition and methane fermentation, microbial communities adapted to scum and addition of activated carbon (AC) to the reactor were investigated. In this study, two experiments were conducted using batch cultures. Microbial communities were analyzed by metagenomic analysis of 16S rRNA amplicons in each experiment. At first, it was compared degradation of scum using adapted sludge (AS) to that using unacclimated sludge (US). Methane yield under the AS condition was 15% higher than that under the US condition. Different scum loading rates on AS were also examined, and the AS condition was tolerable to 17.3 g COD/L loading. According to High-throughput sequencing data analysis, Methanosaetaceae, protein and sugar degrading bacteria have high relative abundance in AS compared that in US. Acetate was accumulated in the US condition on the 8th-15th day. On the other hand, there were no accumulation of acetate in the AS conditions. Secondly, whether the contact with scum changes microbial community on AC was verified. Floating AC had been contacted to the scum, but precipitated AC had been not. As a result, the big difference had observed in microbial communities between floating AC and precipitated AC. *Syntrophomonas* and *Acinetobacter* which degradable LCFA were much more abundant in floating AC. Adding the floating AC to the reactor, approximately twice methane yield was observed than that without AC. These results can contribute to apply to methane fermentation for lipid-rich waste.