Ammonia effect on hydrogenotrophic methanogens and syntrophic acetate oxidizing bacteria - DTU Orbit (10/08/2019)

**Ammonia effect on hydrogenotrophic methanogens and syntrophic acetate oxidizing bacteria**

Ammonia-rich substrates can cause inhibition on anaerobic digestion process. Syntrophic acetate oxidizing bacteria (SAOB) and hydrogenotrophic methanogens are important for the ammonia inhibitory mechanism on anaerobic digestion. The roles and interactions of SAOB and hydrogenotrophic methanogens to ammonia inhibition effect are still unclear. The aim of the current study was to determine the ammonia toxicity levels of various pure strains of SAOB and hydrogenotrophic methanogens. Moreover, ammonia toxicity on the syntrophic cultivated strains of SAOB and hydrogenotrophic methanogens was tested. Thus, four hydrogenotrophic methanogens (i.e. Methanoculleus bourgensis, Methanoculleus thermophilus and Methanothermobacter thermautotrophicus), two SAOB (i.e. Tepidanaerobacter acetatoxydans and Thermacetogenium phaeum) and their syntrophic cultivation, were assessed under 0.26, 3, 5 and 7 g NH4+-N L−1. The results showed that some hydrogenotrophic methanogens were equally, or in some cases, more tolerant to high ammonia levels compared to SAOB. Furthermore, a mesophilic hydrogenotrophic methanogen was more sensitive to ammonia toxicity compared to thermophilic methanogens tested in the study; which is contradicting to the general belief that thermophilic methanogens are more vulnerable to high ammonia loads compared to mesophilic. This unexpected finding underlines the fact that the complete knowledge of ammonia inhibition effect on hydrogenotrophic methanogens is still absent.

**General information**
Publication status: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, Department of Systems Biology, Department of Environmental Science and Engineering
Contributors: Wang, H., Fotidis, I., Angelidaki, I.
Number of pages: 8
Publication date: 2015
Peer-reviewed: Yes

**Publication information**
Journal: F E M S Microbiology Ecology
Volume: 91
Issue number: 11
ISSN (Print): 0168-6496
Ratings:
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 3.77 SJR 1.698 SNIP 1.128
Web of Science (2015): Indexed yes
Keywords: Ammonia Inhibition, Anaerobic Digestion, Biogas, SAOB, Syntrophic Growth
Electronic versions:
fiv130.full.pdf
DOIs:
10.1093/femsec/fiv130
Source: FindIt
Source-ID: 2287857528
Research output: Contribution to journal › Journal article – Annual report year: 2015 › Research › peer-review