

## Accepted Manuscript

Effect of temperature on thermophilic composting of aquaculture sludge:  $\text{NH}_3$  recovery, nitrogen mass balance, and microbial community dynamics

Mitsuhiko Koyama, Norio Nagao, Fadhil Syukri, Abdullah Abd Rahim, Mohd Salleh Kamarudin, Tatsuki Toda, Takuya Mitsuhashi, Kiyohiko Nakasaki

PII: S0960-8524(18)30777-6  
DOI: <https://doi.org/10.1016/j.biortech.2018.05.109>  
Reference: BITE 20015

To appear in: *Bioresource Technology*

Received Date: 20 April 2018  
Revised Date: 27 May 2018  
Accepted Date: 30 May 2018

Please cite this article as: Koyama, M., Nagao, N., Syukri, F., Rahim, A.A., Kamarudin, M.S., Toda, T., Mitsuhashi, T., Nakasaki, K., Effect of temperature on thermophilic composting of aquaculture sludge:  $\text{NH}_3$  recovery, nitrogen mass balance, and microbial community dynamics, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.05.109>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Effect of temperature on thermophilic composting of aquaculture sludge: $\text{NH}_3$ recovery, nitrogen mass balance, and microbial community dynamics

Mitsuhiko Koyama\*, Norio Nagao\*\*, Fadhil Syukri\*\*, Abdullah Abd Rahim\*\*, Mohd Salleh Kamarudin\*\*, Tatsuki Toda\*\*\*, Takuya Mitsuhashi\*, Kiyohiko Nakasaki\*

\*School of Environment and Society, Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo 152-8550, Japan.

\*\*Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia.

\*\*\*Faculty of Science and Engineering, Soka University, 1-236 Tangi-machi, Hachioji, Tokyo 192-8577, Japan.

Email address of the corresponding author: [koyama.m.ad@m.titech.ac.jp](mailto:koyama.m.ad@m.titech.ac.jp)

## Abstract

Development of thermophilic composting for maximizing  $\text{NH}_3$  gas recovery would enable the production of a nitrogen source which is free from pathogen/heavy metal, for the cultivation of high-value microalgae. The present study examined the effect of  $\text{NH}_3$  recovery, nitrogen mass balance, and microbial community dynamics on thermophilic composting of shrimp aquaculture sludge. The emission of  $\text{NH}_3$  gas at 60 and 70 °C was 14.7 % and 15.6 %, respectively, which was higher than that at 50 °C (9.0 %). The nitrogen mass balance analysis revealed that higher temperatures enhanced the solubilization of non-dissolved nitrogen and liberation of  $\text{NH}_3$  gas from the produced  $\text{NH}_4^+$ -N. High-throughput microbial community analysis revealed the shift of

Download English Version:

<https://daneshyari.com/en/article/7066321>

Download Persian Version:

<https://daneshyari.com/article/7066321>

[Daneshyari.com](https://daneshyari.com)