

**UTILIZATION OF SLUDGE FROM BIYAGAMA COMMON  
WASTEWATER TREATMENT PLANT AS FERTILIZER AND  
SOIL CONDITIONER IN SRI LANKA**

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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR  
THE DEGREE OF MASTER OF SCIENCE  
(INDUSTRIAL ECOLOGY AND ENVIRONMENT)  
FACULTY OF GRADUATE STUDIES  
MAHIDOL UNIVERSITY**

**2007**

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**ABSTRACT**

The objective of this study was to ascertain the feasibility of utilizing sludge from Biyagama common wastewater treatment plant as fertilizer and soil conditioner in Sri Lanka. The physicochemical and microbiological properties were determined in sludge. Seed germination and root elongation assays were also carried out with Chinese flowering cabbage and Chinese cabbage seeds to explore phytotoxic effect of sludge.

The study revealed that there are sufficient amounts of N (3.42%) and Ca (3.37%) as CaO in the sludge from Biyagama export processing zone (BEPZ) common wastewater treatment plant (CWWTP). However, P (0.32%) as P<sub>2</sub>O<sub>5</sub>, K (0.14%) as K<sub>2</sub>O, and Mg (0.19%) as MgO contents are not sufficient for sludge to be used as fertilizer. Therefore, the sludge from BEPZ CWWTP is more suitable as soil conditioner than fertilizer if other parameters are complied with compost standards. The high content of Zn inhibited sludge for use as a fertilizer and soil conditioner. It was revealed that after 40 days of sun drying the faecal coliform content was reduced to USEPA Class B biosolid standards, and after 50 days of sun drying the faecal coliform content was reduced to USEPA Class A biosolid standards.

The A2 sludge extract showed the best result in terms of germination, relative seed germination, relative root growth and germination index which was 83%, 100%, 31%, and 31% for Chinese flowering cabbage seeds and 77%, 77%, 54% and 42% for Chinese cabbage seeds respectively. In all sludge extracts the germination index was found to be less than 50%, which indicates a high level of phytotoxic substances. This may be due to high content of Zn and other toxic substances such as organic pollutants. The least sun drying sludge extract (A1) showed significant adverse effect on seed germination and root elongation. The higher electrical conductivity and organic pollutants would likely to be reasons for this adverse effect. Hence, the study recommends that further stabilization is required to reduce heavy metals to acceptable levels prior to using sludge as fertilizer and soil conditioner. This study recommends co-composting for further study as a further stabilization and treatment process.

**KEY WORDS:** SUN DRIED SLUDGE / NUTRIENTS/ HEAVY METALS/ FAECAL COLIFORMS/ SALMONELLA/ SEED GERMINATION/ ROOT ELONGATION

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