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Combined compost and vermicomposting process in the treatment and bioconversion of sludge

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Abstract

Traditional thermophillic composting is commonly for treatment of sludge. A related technique as vermicomposting process, using earthworms to breakdown sludge, is also becoming popular. These two techniques have their inherent advantages and disadvantages. The combined approach suggested in this study to enhance the overall process and improve the products qualities. Two systems, vermicomposting and combined compost-vermicomposting processes, have been investigated in this study. The sludge used in this study was obtained from the drying beds of South Isfahan wastewater treatment plant. The sludge mixed with sawdust to provide C/N ratio of 25/1. Eisenia fetida was the species of earthworms used in the vermicomposting processes. The results obtained indicate reduction in the amount of volatile solids, total carbon and C/N ratio with the vermicompost age, which indicates the reduction in the biodegradable organic content and mineralization of sludge. Also increase in phosphorus concentration by the end process because of mineralization of organic matter. The results indicate that, a system that combines the two mentioned processes not only shortens stabilization time, but also improves the products quality. Combining the two systems resulted in a product that was more stable and homogenous; the product could meet the pathogen reduction requirements. © 2007 Asian Network for Scientific Information.

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