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Stabilization of organic carbon stock in biodegradable solid waste through vermiconversion

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ermiconversion is a speedy conversion technique that converts slowly biodegradable solid wastes to valuable fertilizer materials through combined action of earthworm and microorganisms. Decomposition of organic matter (OM) by microbial activity improves nutrient availability. However, organic matter decomposition rapidly mineralizes organic carbon (OC) and accelerates the release of CO₂, hence, depletes the OC stock. In this investigation, we have addressed the prospect of vermiconversion with Eisenia fetida to stabilize OC stock in municipal solid waste (MSW) without compromising the quality of the converted material. Earthworm (Eisenia fetida) specimens were deployed in MSW mixed with cow dung (CD) in various proportions. The periodic changes in different fractions of OC viz. Total OC (TOC), microbial biomass carbon (MBC), humic acid C and fulvic acid C were studied for 75 days. Maximum OC content was recorded in between 45 and 60 days, with substantial increment in nutrient (N and P) availability. The efficacy of different combinations of MSW and CD were also evaluated under the composting operations. The study clearly indicated significant magnitude of C stabilization due to vermicompositing. Moreover, we obtained substantial treatment wise variations in different C fractions that determine the final C budget at the end of the composting process.

Biography

Satya Sundar Bhattacharya has completed his Ph.D. at the age of 28 years from Visva-Bharati University and served as Forest Ranger under the Govt. of West Bengal for nine years. He is presently working as Assistant Professor in the Department of Environmental Science, Tezpur University, a Central University situated in Assam, India. He has published more than 15 papers in reputed journals and served as reviewer many reputed journals.

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