Tadesse Getahun et al., Expert Opin Environ Biol 2016, 5:3(Suppl)
http://dx.doi.org/10.4172/2325-9655.C1.011

Effect of non-compostable contaminants on composting of organic municipal solid waste at different turning frequencies

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The purpose of this study is to investigate the influence of plastics and metallic bottle caps as contaminants on composting and compost quality. 7% waste plastics and 2% bottle caps were deliberately added to sorted compostable waste as contaminants, and the compost quality was compared with the quality of compost derived from non-contaminated organic waste, and from non-sorted municipal waste containing a significant fraction of organic material. It was found that the maturation time of the composting process was longer for contaminated organic waste, but the quality of the compost was sufficient in all cases. In some conditions, positive effects on the compost quality were even observed. The total carbon content was found to be higher in the finished product of composting with 7% plastic contaminants (22.7%) than in any of the other composting conditions, while a higher concentration of total nitrogen was produced in unsorted municipal waste turned twice a month (2.10%), and in organic waste with plastic contaminants (1.22%). This is postulated to be due to a lower loss of nutrients as CO2 and NH3. The concentration of heavy metals measured in composting with plastic contaminants was lower than for composting of sorted and unsorted municipal waste, while it was higher in composting with 2% metallic bottle caps than the reference (either sorted or unsorted municipal waste), turned twice a month. Nevertheless, all metal concentrations were within the acceptable range as indicated by the Canadian Standards for Compost Products.

Biography

Tadesse Getahun is Assistant Professor of Hazardous and Solid Waste Management in the Department of Environmental Health Science and Technology in Jimma University, Ethiopia. He also serves as an Adviser for student research projects (MSc and PhD program). He is Environmental Science professional. He did his PhD study in Catholieke University of Leuven, Belgium, on sustainable management of solid waste in medium-sized urban centers in east Africa: A case study in Jimma, Ethiopia. He also did his MSc in Land Ecology in International Training Centre, The Netherlands. He conducted several researches on municipal solid waste and published them on internationally recognized journals. He is also winner of the African Interpreunership Award 2015 in the category of Environment.

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