

10th World Congress and Expo on Recycling

July 26-27, 2018 | Amsterdam, Netherlands

Sanitizing of finished compost from composting toilet by solar heat treatment

Seyram K Sossou

University of Ouagadougou, Burkina Faso

On-site sanitation systems joined to resource-oriented sanitation have gained much interest in recent years. One such system is the composting toilet, which are promoted to sanitize human excreta and solid waste for recycling them into fertilizer. In most cases, the temperature in composting toilet, do not get high temperature enough to destroy all pathogens during composting process. This study aimed to assess the sanitizing effectiveness of finished compost with solar heat treatment. Finished composts produced in composting toilet were inoculated with *Escherichia coli*, *Enterococcus faecalis* and *Ascaris lumbricoides* eggs and subjected to solar heating. Three solar installations were used: heat by direct sunlight, in a solar box and in a solar collector. From heated composts, the number of isolated bacteria was determined by plating method and the number of *Ascaris* eggs was determined by microscopy counting. The survival rate of microorganisms was followed during the experiment. The result showed that the temperature regime produced by direct sunlight, solar box and solar collector during heating were categorized as mesophilic ($>30^{\circ}\text{C}$), thermophilic ($>55^{\circ}\text{C}$) and pasteurization ($>70^{\circ}\text{C}$), respectively. The survival rate of microorganisms was low in compost heated by direct sunlight while high in solar box and in solar collector. The direct sunlight heating was not effective for the elimination of microorganisms to a sufficient degree. The total elimination of *E. coli*, *E. faecalis* and *A. lumbricoides* eggs was obtained in 3 days, 5 days, and 8 days with the solar box, respectively, and in 3 days, 4 days, and 5 days with the solar collector, respectively. The nutrients contained in compost as fertilizer has showed no significant reduction during solar heating. The high and uniform temperature distribution obtained with solar box and solar collector during heat treatment have proved to be an efficient option for safe reuse of compost from composting toilet.

Biography

Seyram K. SOSSOU is Assistant professor in the Department of Water and Sanitation of the International Institute for Water and Environmental Engineering (2iE) in Ouagadougou, Burkina Faso. He has completed his PhD in Environmental Engineering at Hokkaido University in Japan where he has worked on developing ecological sanitation for Africa countries. His activities focus generally on resource-oriented sanitation and specifically on non-sewered sanitation, ecological sanitation, solids waste management and health risks aspects of sanitation by-products. He is also interested to the management of project, strategy and advocacy for the global water supply and sanitation sector.

seyram.sossou@2ie-edu.org

Notes: