

Investigation of the Impact of Clay as a Bulking Agent for Food Waste Composting at a Controlled Raised-up Temperature

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In agriculture, the nourishing and substantial quality of soil can be upgraded through transfiguring organic matter in food waste into humus like substance, which is called food waste composting. This is very important as food waste leads to cause odor and pollute the environment. The moisture content (MC), nitrogen content, C/N ratio and aeration in the compost material can be altered through various bulking agents used during the process. The usage of these bulking agents enhances the biodegradation of food waste and transformation of it into effective compost. Therefore, the entire composting process relies on the indispensable role of the bulking agents. Thus, this study was ultimately aimed to evaluate the influence of using clay as the bulking agent for food waste composting at a controlled high temperature (500C). Here a controlled raised-up temperature was used to lead rapid activation of thermophilic microbes. A consecutive five-day study was carried out to analyze the fluctuations of PH, MC and organic matter content (OMC) by preparing composting feedstock using clay as the bulking agent in four different weight percentages (0%, 5%, 10% and 25%). Using a Scanning Electron Microscope (SEM) surface morphology of the samples was analyzed at the initial stage and after five days composting. The analysis of physical parameters was evident that the organic matter was effectively converted to compost at 500C as all the parameters followed the corresponding gradual fluctuations which are presented at the quality compost production. According to the results, no effect was found from clay to control the PH of the composting process of food waste samples. With the increasing of clay percentage there was no significant change of PH was noticed compared to the blank waste sample. With the increment of the clay percentage of the composting feedstock, initial MC was dropped. Furthermore, by the increasing of the clay content of the samples MC was highly reduced. Similarly, OMC was also drastically decreased with the upswing of clay percentage. According to the observations, it can be concluded that clay has been acted as a good bulking agent to food waste composting. At this elevated temperature Food waste composting process had shown a significantly improvement. Presently, further studies are being carried out to further optimize the percentage of clay for food waste composting process at elevated temperature.

Keywords- food-waste composting; bulking agents; clay; controlled-high temperature

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