

Composting of fruits and vegetable wastes: physico-chemical and microbiological analyses

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Abstract

Purpose

The aim of this study was to investigate the composting potential of fruit and vegetable wastes with sawdust in different combinations and to establish the relationship between microorganisms and physico-chemical parameters.

Methods

Three samples were made with the C/N ratios of 50 (sample 1), 45 (sample 2) and 30 (sample 3) by adding fruits waste (apple, banana, orange and kiwi peels) and vegetables waste (cabbage leaves, potato and carrot peels). The total amount of fruit and vegetable wastes was 2.03 kg in each sample to which was added different quantities of sawdust (1.23 kg, 0.46 kg and 0.14 kg) in order to obtain the C/N ratios proposed and to limit the odour. Composting process was monitored during 70 days, while physico-chemical and microbiological analyses were performed.

Results

Results showed that in the first week pH is acid and electrical conductivity values are high for all three samples, and then the pH values are increasing during the composting process, while electrical conductivity values are decreasing. The nitrogen content is low in all samples and will decrease during the first five weeks of composting process, then begin to increase slightly. Cr, Cu, Ni and Zn values in the all three compost samples are below threshold values. During the composting process the microbial communities are constantly changing.

Conclusions

The compost was successfully obtained and meet the requirement standards for agricultural use. It can be concluded that there is statistically significant association between the microorganisms and physico-chemical indicators

Keywords: aerobic process, food waste, heavy metals, microorganisms, nitrogen content

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