

Valorization of waste produced by the universities by composting food waste with mice waste and other solid organic waste

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Abstract

Universities around the world produce large quantities of waste; a large part of which is biodegradable and can be recovered by composting. Five types of biodegradable waste were studied at the Faculty of Sciences of Marrakech: mice waste, green waste, food waste and paper; four windrows were monitored for three months using various proportions and combinations of the various waste; Lime sludge from the sugar beet factory was also tested to hygienize and remove bad smells. During composting, the intense microbial activity in windrow 4 resulted in an increase in temperature (about 55 °C). After three months of composting, the physicochemical parameters of the four final composts were characterized by a C/N ratio between 10 and 11, humidity percentage close to 40%, slightly alkaline pH of 8 and an organic matter content higher than 30% DM. For all the tested composts, the E4/E6 ratio was below 5 suggesting mature composts. The phytotoxicity was determined by the effect of the extracts of the four final composts on the germination and the growth of the seeds of Radish. Germination index exceeding 50% showed the absence of any toxicity. Microbiological analyses in the windrows containing mice waste revealed the noticeable effect of composting and sugar lime sludge on compost sanitation, with a total absence from the start of *Salmonella spp.*, a total abatement (100%) of fecal coliforms, total coliforms and *Pseudomonas aeruginosa* and a significant reduction for fecal streptococci to reach values well above the recommended standards: 4, 74 10² CFU / g MS for windrow 3 and 4, 65 10² CFU / g MS for windrow 4. The obtained results showed the quality of the composts and confirmed the possibility of using these composts as soil amendment as part of the sustainable waste management in the university establishments.

Keywords: sugar lime sludge, composting, organic waste, physicochemical parameters, quality of compost.