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Coffee husk composting: An investigation of the process using molecular and non-molecular tools

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In Ethiopia, 65% of the total export comes from coffee production. In addition, approximately 15% (i.e., 20million) of the population make a living out of the industry. During the processing, two important coffee wastes are generated: Coffee husk and Coffee pulp. However, the uncontrolled release of these wastes to the environment represents series problems mainly due to the high content of tannins and phenolic compounds contained in these products. Therefore, a study was done to understand the characteristic of coffee husk composting. Various parameters were measured during 90 days composting process of coffee husk mixed with cow dung (Pile 1), with fruit/vegetable wastes (Pile 2) and coffee husk alone (Pile 3). Samples were collected on days 0, 32 and 90 for chemical and microbiological analyses. As a result, C/N ratios of Piles 1 and 2 decreased significantly over the 90 days. The highest bacterial counts at the start of the process and highest actino bacterial counts at the end of the process (Piles 1 and 2) indicated microbial succession with concomitant production of compost relevant enzymes. Denaturing gradient gel electrophoresis of rDNA and COMPOCHIP microarray analysis indicated distinctive community shifts during the composting process, with day 0 samples clustering separately from the 32 and 90 day samples. This study, using a multi parameter approach, has revealed differences in quality and species diversity of the three composts.

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