

TITLE: VARIATION OF THE NUMBER OF HETEROTROPHIC BACTERIA IN COMPOSTING USING BREWERS' SPENT GRAIN

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ABSTRACT:

Brewers' spent grain is the main residue of the production of draft beer, accounting for 85% of the total of by-products generated. An alternative to the treatment of organic waste such as brewers' spent grain is the composting. An experiment is being carried out at the *Campus* of Sete Lagoas of UFSJ with the objective of optimizing the use of brewers' spent grain in the production of organic compost. For this they were made three compost piles containing remains of grass (with predominance of *Brachiaria* sp.) and brewers' spent grain. One parameter that can be used in monitoring the composting process is the counting of aerobic heterotrophic bacteria. The objective of this work was to count the aerobic heterotrophic bacteria in the compost piles to know the variation of the number of these bacteria between the three samplings of each compost pile and also between the compost piles. To perform the counting, three 10g samples were collected at different points of each of the three 40-days-composting piles. The counting was then performed by serial dilution technique and plating on Petri dishes containing Nutrient Agar medium incubated for 48 hours in triplicate. The number of aerobic heterotrophic bacteria per gram (fresh weight) was, for the piles 1, 2 and 3 respectively: $1,5 \times 10^8 \pm 9,2 \times 10^7$, $7,8 \times 10^7 \pm 3,2 \times 10^7$ and $9,7 \times 10^8 \pm 5,0 \times 10^9$; $5,5 \times 10^8 \pm 7,0 \times 10^7$, $4,4 \times 10^8 \pm 1,4 \times 10^8$ and $1,1 \times 10^8 \pm 2,4 \times 10^7$; $6,7 \times 10^7 \pm 3,8 \times 10^7$, $2,2 \times 10^8 \pm 5,0 \times 10^7$ and $3,4 \times 10^9 \pm 1,2 \times 10^9$. If we consider the average of the 9 Petri dishes growing the bacteria from each compost pile, we have the following results for the piles 1, 2 and 3 respectively: $4,0 \times 10^8 \pm 5,0 \times 10^8$, $3,7 \times 10^8 \pm 2,1 \times 10^8$ and $1,2 \times 10^9 \pm 1,7 \times 10^9$. The results show that there was no great variation in the number of bacteria per gram of compost between the piles 1 and 2, with a greater variation in pile 3. In the next steps of the work being carried out, the procedure described in this project will be applied to determine the amount of aerobic heterotrophic bacteria in compost piles with brewers' spent grain during the initial, thermophilic and maturation stages of composting.

Keywords: heterotrophic bacteria, composting, brewers' spent grain

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