

Abstract

Spent coffee grounds (SCG) constitute a significant portion of the food waste from cafes. Currently, most SCG are landfilled or end up in the sewer system, which is a serious environmental problem. The aim of this study was to evaluate the effectivity of vermicomposting with continuous feeding of *Eisenia andrei* earthworms, and to find the optimal ratio of SCG and straw pellets. The greatest number and biomass of earthworms was found in the treatment with 25% vol. SCG + 75% vol. straw pellets. In this treatment, the upper 45-day-old layer exhibited 1.6-fold and 4.5-fold greater earthworm number and biomass, respectively, than the bottom 180-day-old layer. Earthworm weight decreased in direct proportion to the layer age, with an average individual weight of 0.07 g. The oldest treatment layer was characterized by lesser contents of fungi and enzymes, such as acid phosphatase, lipase, chitinase, cellobiohydrolase, alanine aminopeptidase, and leucine aminopeptidase, compared to the younger layers. Further, the oldest treatment layer had suitable agrochemical properties (pH/H₂O = 7.8, EC = 709 μ S/cm, C/N 13.6, P_{tot} = 0.25%, K_{tot} = 2.2%, and Mg_{tot} = 0.21%, with 44%, 44%, and 11% availability, respectively, of the total content). Earthworms were able to substantially reduce the caffeine stimulant content, which is considered the most representative pharmaceutically active compound.