Vermicomposting of Landfill Leachate using Earthworms for Biofertilizer Production

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Abstract:
. The accumulation of waste in landfill site is mainly due to increased urbanization and industrialization. The leachate produced beneath the landfills led to critical environmental issue. The objective of this study was to determine the effects of vermicomposting of landfill leachate using earthworms on biofertilizer production. Earthworms were utilized to convert organic matter in leachate into plant-nutrients that enhance the growth of plants and plants productivity. The concentration of nitrate (N), phosphorus(P) and potassium(K) in vermicompost was found to increase while pH and number of earthworms declined at the end of the vermicomposting period. The vermibin containing 90 earthworms (V1) (approximate 52g) in a mixture of 150 ml of leachate and 798 g of soil obtained the highest concentration of NPK compared to those containing 39 (V2) earthworms and 15 (V3) earthworms. This indicates that the concentration of NPK increased with the added amount of earthworms. V1 experienced an increase of 53–fold in N, 194-fold in P and 210–fold in K due to earthworm activity during the vermicomposting, thus improving the number of leaves (32 leaves). The data shows that vermicomposting might be a suitable technology for the decomposition of landfill leachate into nutritive biofertilizer.

Keywords: landfills; Urbanization; Industrialization

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