

ABSTRACT

CHANGES POPULATION MICROORGANISM DURING VERMICOMPOSTING VARIOUS ORGANIC SOLID WASTE

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The development and rapid population growth in urban areas resulted in wider residential area and cause increased solid waste generated. One of the alternative waste management / waste that is composted by *vermicomposting* method. This research aims to study the changes in populations of microorganisms (actynomicetes, bacteria, fungi) during *vermicomposting* of organic solid waste (waste market, leaves, and rice straw). The hypothesis proposed in this study were (1) The population of microorganisms (actynomicetes, bacteria and fungi) on solid waste market is higher compared with leaves and rice straw. (2) The population of microorganisms (actynomicetes, bacteria and fungi) was higher in the market of solid waste that is applied earthworm *Lumbricus rubellus*. (3) The population of microorganisms (actynomicetes, bacteria and fungi) was higher in a given market solid waste lime compared to controls. (4) The population of microorganisms (actynomicetes, bacteria and fungi) are highest on the market of solid waste is applied to the earthworm *Lumbricus rubellus* and given a lime.

This research was conducted using randomized block design (RAK), and treatment arranged in a factorial 3 x 3 x 2 with three replications, so there are 54 experimental units. The first factor is application of waste that is: L1: Waste Market, L2: Waste foliage, L3: Rice straw. The second factor is the application of worms that is: C0: no earthworms, C1: *Eisenia fetida*, C2: *Lumbricus rubellus*. The third factor is the calcification of K0: without lime, K1: with lime (5% CaCO₃ kg⁻¹ of waste materials). Homogeneity range of the data was tested with Bartlett test and aditifitas data with Tukey test followed by analysis of variance to test the value being conducted with LSD with significance level of 5% and 1%.

Results indicated that (1) Population actynomicetes, bacteria and fungi was higher in vermicomposting of solid waste market as compared with leaves and straw waste. (2) Population actynomicetes, bacteria and fungi was higher in the earthworm *Eisenia fetida* compared with that given the earthworm *Lumbricus rubellus* except the bacterial population in the observation week - 8 was higher in the earthworm *Lumbricus rubellus*. (3) Population actynomicetes, bacteria and fungi was higher in *vermicomposting* are given without any lime compared with lime. (4) Population actynomicetes, bacteria and fungi, the highest on the market of solid waste *vermicomposting* earthworm *Eisenia fetida* given and given a lime.

Key words: Earthworm, Lime, Organic Waste, Microorganisms, *Vermicomposting*.