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The Study on Molasses Quantity Efficiency Organic by Using Earthworm (*Pheretima peguana*)

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Abstract: From the study on Molasses quantity efficiency organic by using earthworm (*Pheretima peguana*), in the study has been divided into 6 sets of experimental set, which were T_1 was a controller by using an organic waste from vegetables and left them naturally decomposed, T_2 was a controller by using an organic waste from vegetables, which were mixed with molasses in the proportion of 1:5 1:10 and 1:15 kg mL^{-1} and left them naturally decomposed, T_3 used the earthworms in the amount 0.5 kg to decompose the organic waste from vegetables, T_4 used the earthworms in the amount 0.5 kg to decompose the organic waste from vegetables, which were mixed with molasses in the proportion of 1:5 kg mL^{-1}, T_5 used the earthworms in the amount of 0.5 kg to decompose the organic waste from vegetables, which were mixed with molasses in the proportion of 1:10 kg mL^{-1} and T_6 used the earthworms in the amount of 0.5 kg to decompose the organic waste from vegetables, which were mixed with molasses in the proportion of 1:15 kg mL^{-1}. The study has a propose as following: To find an efficiency of organic waste disposal, which is limitedly had the least time duration. To compare time durations in disposing an organic waste from vegetables by using earthworm (*P. peguana*). From the study has found that the earthworms (*P. peguana*) were able to dispose the organic wastes, which mixed with molasses, which is quicker than the organic waste without molasses. When, brought all 6 experimental sets to compare the time durations in disposing an organic waste form vegetables, had found that experimental set T_6 was the best in decomposing organic waste, which took only 3 days, secondly, were the experimental sets of T_5 and T_4, for the least time duration, which took 9 days to decompose organic wastes was the experimental set of T_1.

Key words: Efficiency, organic waste, earthworm, molasses, vegetables, *P. peguana*

INTRODUCTION

Presently, environmental impacts are the major problem for country, especially the overwhelming waste problem in the city, which is constantly causing more intensity, even though, the government has a plan to construct incinerators and as well as making a campaign in waste categorization and buy-back in order to reuse. However, all these methods still unable to reduce waste's problems, some of the increased wastes are an organic waste from raw markets and communities, which is having the amount of wastes quantity almost half of the whole quantity, which is 46% (Anonymous, 2007), there is a various methods to dispose an organic waste such as burying, fertilizing and using as an animal feed, but the said methods still can not solve waste problems completely. Consequently, a safe method finding for the environment, especially the use of living lives that can change wastes to be an organic fertilizer, which could see that earthworms can dispose organic waste, especially the organic composts, which have a high level of nitrogen compound such as raw wastes, food wastes from raw markets and communities. Furthermore, there is a found that earthworms characteristically like consuming sweet foods such as fruits also, Arnut (2007). But now a day, organic waste disposal by using earthworms still takes such a long period of time in decomposing, then, as the said reasons need to build up a related knowledge via this research by using the earthworms (*P. peguana*) in limiting an organic waste from vegetables, which the experimental vegetable wastes will be added molasses as a mixture in various proportions in order to increase efficiency of earthworms (*P. peguana*) to be quicker in the organic wastes disposal.

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Research objective: The study on Molasses quantity efficiency organic by using earthworm (*Pheretima peguana*) has a research objective to find an efficiency of organic waste disposal, which has the least time duration and to compare time durations in organic waste disposing by using earthworms (*P. peguana*).

Research hypothesis: Adding molasses to be a mixture in organic waste from vegetables would help decreasing time duration to be quicker on organic waste disposal by earthworms (*P. peguana*).

Research boundary: The study on Molasses quantity efficiency organic by using earthworm (*Pheretima peguana*) has a research boundary is to study time durations in decomposing an organic waste from raw vegetables that differently added molasses, which are 1:5 1:10 and 1:15 kg mL^{-1} and to compare each of experimental set's time durations in decomposing an organic waste from vegetables.

MATERIALS AND METHODS

The study on Molasses quantity efficiency organic by using earthworm (*Pheretima peguana*) has a research method as following:

Organic waste preparation from raw vegetables: The organic wastes have been brought from raw market, Mueang District, Mahasarakham Province and chopped them into a small pieces, which is in the size of 0.5 inches in order to reduce time duration in decomposing, because when organic waste has small sizes then there would be more surface area, which helps to decompose quite quickly and also earthworms (*P. peguana*) would be able to dispose an organic wasted quickly because, they like consume organic waste, which already become rotten and decomposing to be a liquid (Arnut, 2007).

Earth soil preparation for earthworm's habitat: Animal droppings have been brought to mix together between droppings of chicken, pork and cow in the proportion of 1:1:1 kg and mixed with earth soil in order to be a habitat for earthworms (*P. peguana*). The proportion between animal droppings and earth soil in this research was 10:7 kg and left it, until the temperature reach under 28°C because earthworms (*P. peguana*) very like living in the temperature span from 15-28°C.

Study method: The study on Molasses quantity efficiency organic by usingearthworm (*Pheretima peguana*) by having each one of 6 experimental sets repeatedly test for three times in order to find the quickest time duration of experimental set in decomposing.

Experimental set T_1: This is a natural decomposition controller by using 1 kg of organic waste from raw vegetables without molasses.

Experimental set T_2: This is a natural decomposition controller by using organic waste from raw vegetables mixed with molasses in the proportion of 1:5, 1:10 and 1:15 kg mL^{-1} sec.

Experimental set T_3: The earthworms (*P. peguana*)'s habitat, which used earth soil mix with animal droppings in the proportion of 10:7 kg and also, earthworm it selves for 0.5 kg to eat 1 kg of organic waste from raw vegetables without molasses.

Experimental set T_4: The earthworms (*P. peguana*)'s habitat, which used earth soil mix with animal droppings in the proportion of 10:7 kg and also, earthworm, it selves for 0.5 kg to eat an organic waste from raw vegetables, which mixed with molasses in the proportion of 1:5 kg mL^{-1}.

Experimental set T_5: The earthworms (*P. peguana*)'s habitat, which used earth soil mix with animal droppings in the proportion of 10:7 kg and also, earthworm it selves for 0.5 kg to eat an organic waste from raw vegetables, which mixed with molasses in the proportion of 1:10 kg mL^{-1}.

Experimental set T_6: The earthworms (*P. peguana*)'s habitat, which used earth soil mix with animal droppings in the proportion of 10:7 kg and also earthworm it selves for 0.5 kg to eat an organic waste from raw vegetables, which mixed with molasses in the proportion of 1:15 kg mL^{-1}.

In the experimental set, T_3-T_6 were watered in very 2 days and each time used a liter of water in order to make more humidity for the earthworms until organic waste will be completely decomposed and observed biological characteristic of organic waste till became an organic fertilizer and the used organic waste controller became black colour.

RESULTS AND DISCUSSION

From the study on efficiency of organic waste disposal by using earthworms (*P. peguana*) found that using molasses as part of organic waste from raw vegetables would help organic wastes it selves made more sweetness as following Table 1 and earthworms (*P. peguana*) have quicker decomposed organic waste.

Table 1: Quantitative sweetness of the organic waste and molasses, which were used in the experiment

The used materials in experimenting	Sweetness (%)
Molasses	50.66±0.58
Organic waste from raw vegetables	8.47±0.25
Organic waste from raw vegetables mixed with molasses 1:5 kg mL^{-1}	17.23±0.49
Organic waste from raw vegetables mixed with molasses 1:10 Kg mL^{-1}	24.20±0.30
Organic waste from raw vegetables mixed with molasses 1:15 Kg mL^{-1}	30.77±0.40

Table 2: Time duration in organic waste decomposition by earthworms (*P. peguana*) in each experimental set

Experimental set	Time duration in organic wastedecomposition (day)
T_1	9
T_2	7
T_3	6
T_4	4
T_5	4
T_6	3

From the Table 1, the sweetness values in organic waste from raw vegetables are shown relatively to the molasses adding. By earthworms (*P. peguana*) in each experimental set. From the Table 2, there is the quickest experimental set in decomposing organic waste from raw vegetables, which is the experimental set T_6 due to the fact that the organic waste had the most mixture of molasses, which have a value of sweetness at 30.77±0.40% as shows in Table 1, causing the organic waste a sweet test and makes earthworms (*P. peguana*) dramatically consume organic waste, which is accordantly to Arnut (2004) research, mentioning that earthworms like consuming sweet fruits. For the longest day in decomposing organic waste from raw vegetables by using earthworms (*P. peguana*), which is the experimental set T_3 spent 6 days, it because the organic waste in T_3 had the least mixture of molasses, which caused the organic waste a sweetness value at 17.23±0.49%, which made earthworms (*P. peguana*) less consume organic waste, which is accordantly to Jurairat's research (2009), studying an organic waste disposal by using Earthworms and Microbe (EM) and as well as Nirun's research (2004) studying potentiality of the earthworms (*P. peguana*) in decomposing organic waste and similarly producing fertilizer to nature. In case of the experimental sets T_4 and T_5 spent 4 days decomposing organic waste, which is not statistically different, for the controller experimental sets, which were mixed with molasses spent 6 days decomposing organic waste.

CONCLUSION

From the study on efficiency of organic waste disposal by using earthworms (*P. peguana*), being able to conclude that sweetness quantity, which mixed with organic waste from vegetables have an effect on organic waste decomposition by using earthworms (*P. peguana*), which the experimental sets that mixed between organic waste and molasses in the amount of 15 mL has spent the quickest time duration in decomposing, because of organic waste has sweetness value at 30.77±0.40%.

In case of organic waste that mixed with molasses in the amount of 5 mL has spent the longest time duration in decomposing organic waste because of organic waste from vegetable has a sweetness value at 17.23±0.49%, which is held to be less that makes earthworms (*P. peguana*) decompose quite slow.

So, whenever we are about to dispose an organic waste by using earthworms (*P. peguana*), we do not need the foreign earthworms species, which is quite expensive in disposing an organic waste but at the same time we are able to use a local earthworms, which is available in the areas by using an appropriated proportion of molasses to be a mixture in organic waste, which would cause earthworms (*P. peguana*) quickly dispose an organic waste exactly the same as the foreign earthworms species.

RECOMMENDATIONS

In the study, on organic waste disposal by using earthworms, there should be more quantitatively adding earthworms and molasses in order to helps disposing an organic waste quicker.

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