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*Proceeding Paper*

# EFFECT OF PINEAPPLE PEEL ACTIVATOR (ANANAS COMOUS L. MERR) ON THE TIME OF COMPOST FORMATION ORGANIC VEGETABLE

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**Abstract**

The increasing waste problem will cause problems for the community. This can lead to environmental hygiene problems such as unpleasant odors, impaired eye sight, and several threats of disease problems that can arise. In this case organic waste such as nianas peel can be used as an activator in helping to speed up the composting process time. The research design used Quasi experiment with post test design with control only design. Data analysis using One Way Anova Test and Bonferroni Test. The results of the One Way Annova test obtained ρ value = 0,000 <0.05 means there is a difference in the time of compost formation and the Bonferroni Test obtained ρ value =,000 <0.05 means there is a very significant difference. Pineapple peel activator treatment is 3 days faster than Em4 treatment and 9 days faster than control treatment. And the Em4 treatment was 9 days faster than the control treatment. It is stated that pineapple peel activator is more effective in accelerating the time of compost formation. Research can provide information in processing waste into useful and other alternatives in handling organic vegetable waste.

**Keywords**: Pineapple Peel, Compost, Activator, Organic Vegetable, Waste

## INTRODUCTION

Waste of various types is now increasing, causing problems for the community. It can lead to disruption of the cleanliness of the surrounding environment causing problems such as unpleasant odors, impaired eye sight, as well as several threats of disease problems that can arise. Households,markets, agricultural fields are one of the sources of waste, fortunately some of these types of wastecan be composted such as organic waste. Organic waste is waste derived from organic materials that can be degraded by microbes. Compostfertilizer is the decomposition and irrigation of the remains of living things (Rohmadi, 2022).

Compost is the decomposition of organic matter. Organic compost that has undergone a weathering process due to the interaction of microorganisms (decaying bacteria) working in it (Benyamin, 2022). Compost is the incomplete partial decomposition of a mixture of organic materials that can be artificially accelerated by a population of microbial species under warm, moist environmental conditions (Manik, 2022). Compost functions in improving soil structure, clay soil texture and helpingsandy soil to retain water, to improve soil root health is also one of the functions of compost (Yusnaweti, 2023).

EM4 solution contains microorganisms whose function can help fermentation in a fast time on organic matter. EM4 can also be an alternative in providing energy to the fermentation process (Dewi, 2022). The researcher's goal is to use pineapple peel as an activator that can be more effective than using Em4and without any additions in the composting process.

## RESEARCH METHOD

This research is a quasi-experimental study with a posttest with control only design. The research variable is the measurement of temperature, pH, and humidity parameters. Data analysis was done descriptively and presented in the form of tables and narratives.

### Research Process

This research is an experimental study that aims to reveal the effect of pineapple peel activatoron compost formation time.

*Tools and Materials*

Some of the tools and materials that must be prepared in making pineapple peel activator includetreatment containers, Handscoon, Knife, Blender, Stirrer, Scales, Sieve, Pineapple Peel, Leri water, Water, Liquid brown sugar, Organic waste.

*Activator Preparation Procedure*

The process for making activators to speed up the cooking stage. The steps for making pineappleskin activator are as follows first prepare 3,000 grams of pineapple skin in a bucket, then let it stand for 1 day until the pineapple skin decomposes, after decomposing the pineapple skin is squeezed and do not forget to filter it with a sieve to separate it from the pineapple skin pulp, then take 1 liter of water, After filtering, add 0.5 liters of leri water and 2 liters of water, Then stir with a stirrer, then close, Every day do checks by stirring until this mixture releases foam and then close again, After 7 days until the mixture is no longer foaming, then the mixture can be used, And don't forget to add melted brown sugar which is included as much as 150 grams, the activator can be used.

*Research Procedure*

Prepare the materials and tools that will be used, Chop the vegetable waste until it is 3-4 cm in size and then put it into each experimental container of 5 kg each, Each treatment group containeris added with a sign such as: Container A (Waste plus pineapple peel activator), Container B (Waste plus Em4), Container C (Waste without any additions), Then stirring is carried out everyday until evenly distributed and then stored during the process, After the compost material is buried then turned over to evenly decompose the compost material, Every day measurements oftemperature, pH, and humidity are taken using the Soil Survey Instrument, Every six days do the treatment of watering 100 ml of pineapple peel activator and 100 ml of Em4, If in the composting process the waste mixture looks dry, it is necessary to water it with water but watering does not cause the mixture to become muddy, Observations are made and recording the speed of the composting process time needed for each treatment to produce compost.

## RESEARCH RESULTS

### Compost formation time

*Table 1: Frequency distribution of compost formation time*

| Repetition | Pineapple peel activator | | Em4 | | Control | |
|---|---|---|---|---|---|---|
| | Day | Physical | Day | Physical | Day | Physical |
| 1 | 21 | Blackish in color, smells and has a soil-like texture. | 24 | Blackish in color, smells and has a soil-like texture. | 31 | Blackish in color, smells and has a soil-like texture. |
| 2 | 20 | | 24 | | 31 | |
| 3 | 21 | | 24 | | 31 | |
| 4 | 21 | | 24 | | 30 | |
| 5 | 21 | | 23 | | 30 | |
| 6 | 20 | | 23 | | 30 | |
| 7 | 21 | | 24 | | 31 | |
| 8 | 21 | | 24 | | 31 | |
| **Average** | 20,75 | | 23,75 | | 30,63 | |

Table 1. shows that the distribution of composting time. The pineapple peel activator treatmentwas formed on day 20.75, the Em4 treatment was formed on day 23.75 and the control treatmentwas formed on day 30.63.

*Table 2. Frequency distribution of differences in compost formation time*

| Variables | Hari | Perbedaan |
|---|---|---|
| **Pineapple peel activator** | 20,75 | 3 Days Faster than Em4<br>9 Days Faster than control |
| **Em4** | 23,75 | 6 Days ahead of control |
| **Control** | 30,63 | - |

Table 2 shows that the ananas peel activator treatment is more effective in accelerating the compost formation time compared to compost with Em4 and control treatments.

*Table 3. One Way Anova Test Results Compost formation time in each treatment*

| Variables | Mean | Std | 95% CI | ρ value |
|---|---|---|---|---|
| **Pineapple peel activator** | 20,75 | 0,463 | 20,36-21,14 | 0,000 |
| **Em4** | 23,75 | 0,463 | 23,36-24,14 | |
| **Control** | 30,63 | 0,518 | 30,19-31,06 | |

Table 3. One Way Anova test results obtained ρ value = ,000 <0.05 which can be interpreted that thereis a difference in the time of formation of organic compost in the treatment between pineapple peel activator, Em4, and control.

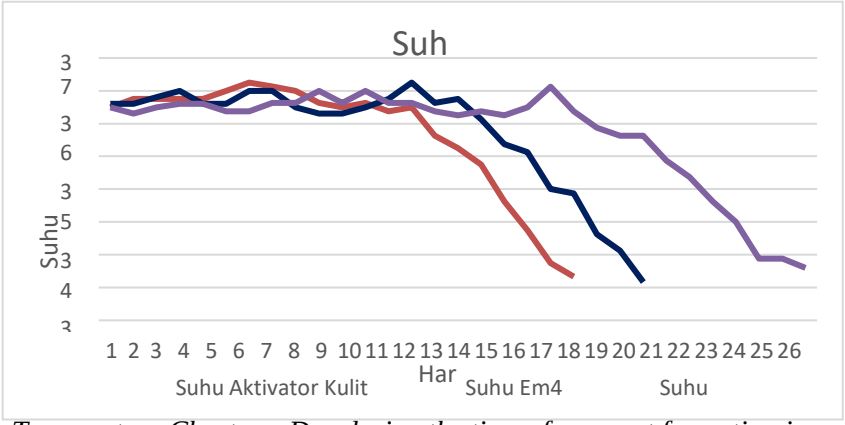


*Figure 1. Temperature Chart per Day during the time of compost formation in each treatment*

Based on the graph, it shows that the temperature of pineapple peel activator compost on the first day is 35.5°C and the final temperature is 30.3°C. The temperature of Em4 compost on the first day was 35.6°C and the final temperature was 30.1°C. The control temperature on the first day was 35.5C and the final temperature was 30.6°C.

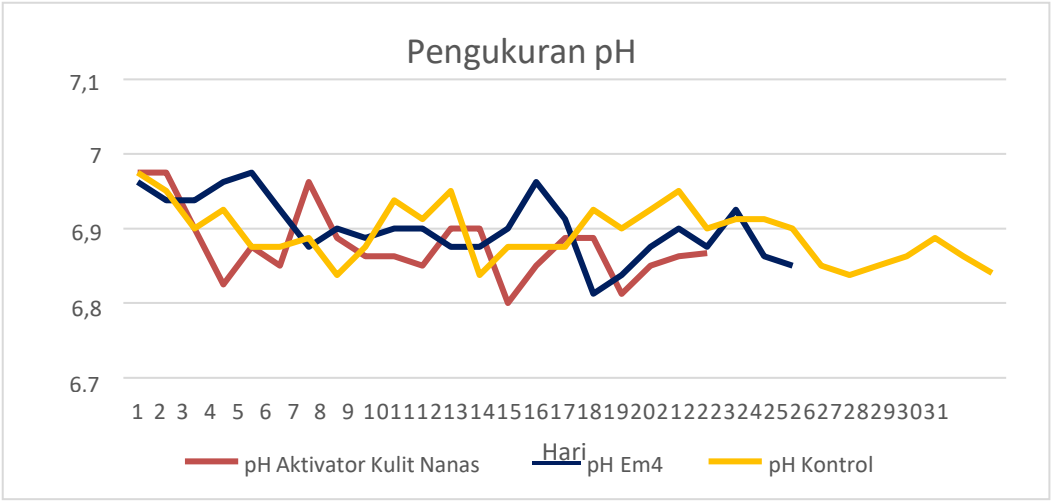


*Figure 2. Graph of pH per day during compost formation time*

Based on the graph shows that the pH of the pineapple peel activator on the first day was 6.9 and on the final day the pH ranged to 6.8. pH Em4 on the first day was 6.9 and on the final day the pH ranged to 6.8. pH control on the first day was 6.9 and on the final day the pH ranged to 6.8.

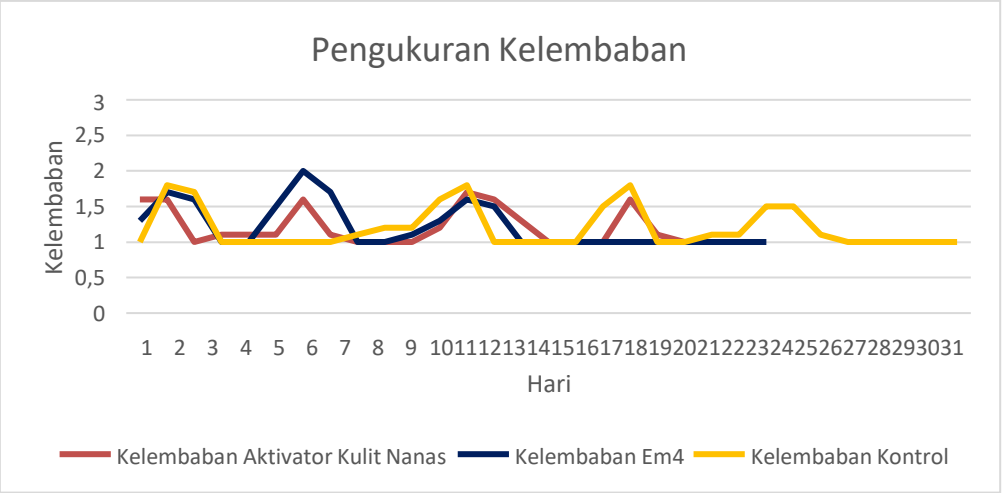


*Figure 4.3 Graph of Moisture Per Day during compost formation time*

Based on the graph, it shows that the moisture of pineapple peel activator, Em4 and control isaround the dry group.

## DISCUSSION

### The formation time of organic compost treated with Pineapple Peel Activator

From the results of the One Way Anova test, it was found that ρ value = ,000 <0.05, which means that there is a difference in the formation time of organic compost. From the observationof composting, it can be stated that the time of compost formation with 100 ml of pineapple peelactivator treatment is 20.75 days, 100 ml of Em4 is 23.75 days and the control treatment is 30.36days.

The difference in the time of formation of organic compost is thought to be due to the number of decomposing microorganisms contained in each treatment is different even at the same dosagevolume. If the number of decomposing microorganisms in pineapple kuli activator, Em4 and control is different, the ability to degrade organic raw materials will also be different.

### Differences in the formation time of organic compost in each treatment

From the results of the Bonferroni test, the value of ρ value = ,000 <0.05 means that there is a very significant difference. Where the difference in the time of compost formation turns out thatpineapple peel activator is 3 days faster than compost with Em4 treatment while pineapple peelactivator can also

accelerate the formation of compost 9 days compared to control treatment compost. Compost with Em4 treatment is 6 days faster than the control compost.

From the description above that in composting research using pineapple peel activator can affectthe time of compost formation. The effect is because pineapple water can help speed up composting because it contains nutrients that can act as a bio starter / decomposer to break downraw organic matter into organic fertilizer quickly (Agustina, 2021).

Pineapple peel activator contains free bacteria that synthesize nitrogen compounds, sugars and other bioactive substances. The metabolites produced can be absorbed directly by plants and areavailable as a substrate for the development of beneficial microorganisms by having bacteria, namely lactobacillus sp, which functions as a fast decomposer of organic matter (Apriyani, 2021).

So that the pineapple peel activator treatment is more effective than the Em4 treatment and the control in accelerating the time of compost formation. In composting Em4 can also accelerate the composting process, the addition of Em4 can eliminate odors that arise during the composting process if composting takes place properly (Fatma, 2021). Compared to the controltreatment, Em4 can more quickly help the formation of compost formation time because compost with control treatment experiences the formation of mature compost longer due to the absence of additional decomposers but with its own natural ingredients. The difference in the formation time of the three composts is also thought to be due to the number of decomposing microorganisms contained in each treatment is not the same.

**Temperature, pH, and moisture parameters**

Observations of composting the temperature of compost with pineapple peel activator treatmenton the first day was 35.5°C and the temperature decreased on days 14-21. So that the overall temperature ranged from 36.2°C - 30.3°C. The temperature of Em4 during the first day was 35.6°C and the temperature decreased on days 17-24. So that the overall temperature ranged from 36.2 ° C - 30.1 ° C. The control temperature on the first day was 35.5°C and the temperaturedecreased on days 26-31. So that the overall temperature ranged from 36.1 ° C - 30.6 ° C.

This gradual decrease in temperature is due to microbial activity in decomposing organic matterlevels which can be interpreted that the compost has entered the maturity stage. Temperature has a role in providing factors to influence the composting phase. Temperature plays an important role in providing information about the activity of microorganisms that exist during the composting process According to SNI 19-7030-2004 regarding compost specifications, the temperature of mature compost is with a groundwater temperature of ± 30ºC.

According to SNI 19-7030-2004 regarding compost specifications, the pH of mature compost iswith a pH of 6.80-7.49. pH has an influence on the composting stage because the destruction ofcompost naturally occurs at a neutral pH and pH that is too high and too low will be toxic to plants.

The results of moisture observations in composting both pineapple peel activator treatment, Em4, and control ranged from dry (15-44%). The moisture of compost material affects the activity of microorganisms involved in composting. Moisture plays a very important role in themetabolic process of microbes and indirectly affects the supply of oxygen. Microorganisms canutilize organic matter if the organic matter is soluble in water (Wulandari, 2021).

**Physical Characteristics of Compost**

From the observation of mature compost, it can be stated by the presence of characteristics in the form of blackish color like the color of the soil, if the organic or vegetable material is still greenish, yellowish or the color is still similar to the raw material, it means that the compost is not mature. The pungent odor of the compost also indicates that the compost is not mature. while the mature compost produces odor and the texture will become crumbly like soil accordingto SNI 19-7030-2004 standards.

## CONCLUSIONS AND SUGGESTIONS

One Way Anova test results obtained ρ value = ,000 <0.05 means there is a difference in the time of compost formation. The formation time of organic compost with pineapple peel activator treatment matured on day 20.75, Em4 treatment matured on day 23.75 and control treatment matured on day 30.63.

Bonferroni test results obtained ρ value = ,000 <0.05 means there is a very significant difference. The difference in the time of organic compost formation of pineapple peel activator treatment is 3 days faster than Em4. Pineapple peel activator treatment is 9 days faster than the control treatment while Em4 treatment is 6 days faster than the control treatment. From the description above, pineapple peel activator is more effective in accelerating the time of compost formation.

The temperature of organic compost from each treatment ranged from 30.1ºC -36.2ºC, pH ranged from 6.8-6.9 and humidity was in the dry group (15-44%).

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