

APPLICATION OF *Eco-Enzyme* CONVERSION RESULTS INTO DISHWASHER SOAP

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Abstract

The application of the conversion results from *Eco-Enzyme* into dishwashing soap, the fermentation process lasts for one months, where the resulting liquid is dark brown in color and has a very strong sweet and sour fermented aroma. There is a lack of public knowledge about the very profitable benefits of *Eco-Enzyme*, such as as a multi-purpose cleaner as a multi-functional liquid which can be converted, one of the ways, into dishwashing soap. This research aims to determine the application of the results of converting *Eco-Enzyme* into dishwashing soap. This research used experimental methods and a research period of 3 months. This *Eco-Enzyme* is made with a ratio of organic ingredients: sugar: water 3:1:10. The *Eco-Enzyme* harvest is converted into dishwashing soap by adding lerak and *Methyl Ester Sulfonate* (MES). *Eco-Enzyme* conversion soap was then applied to several treatment groups: plastic plates, cans and glass. The results of the application show that the dishes washed with *Eco-Enzyme* using lerak have not completely removed dirt, oil and odors in each treatment, whereas *Eco-Enzyme* using *Methyl Ester Sulfonate* (MES) when compared with Sunlight brand liquid soap sold on the market shows that there are similarities both in terms of cleanliness, tapestry and smell. The research conclusion is that the application of the *Eco-Enzyme* conversion results has significant potential to be developed into an active ingredient for environmentally friendly dishwashing soap.

Keywords: Eco-Enzyme Conversion, Dishwashing Soap.

INTRODUCTION

Eco-Enzyme is an environmentally friendly product that is very easy for anyone to make and is the result of fermenting organic kitchen waste which has a strong sweet and sour fermented aroma. Making *Eco-Enzyme* from organic waste obtained from fruit peels and vegetable waste is currently increasingly popular and widely developed because it is very effective, efficient, economical, practical and environmentally friendly Kumar (2017).

Fruit waste in the form of fruit peels, leftover vegetable scraps or kitchen spices will only end up in the trash, if buried it will cause problems, but this waste can be processed into *Eco-Enzyme* which has multi-purpose value. This is as stated by Neupane and Khadka (2019) that: The use of fruit peels to become *Eco-Enzymes* is an evolution of science through anaerobic fermentation which is very profitable. Furthermore, according to Mavani, et al (2020) that: Fermented fruit peel waste with sugar and water will produce *Eco-Enzymes* which are rich in medical benefits.

This *Eco-Enzyme* can be a multi-purpose liquid and its applications include households, agriculture and animal husbandry. Where basically *Eco-Enzyme* can speed up biochemical reactions in nature so that it can produce useful enzymes. Because of its content, *Eco-Enzyme* has many benefits, one of which is that it can be used as a cleaning agent for household utensils, namely dishwashing soap.

The application of the conversion results from *Eco-Enzyme* into dishwashing soap, the fermentation process lasts for three months, where the resulting liquid is dark brown in color and has a very strong sweet and sour fermented aroma. This is supported by the results of research conducted by Tang and Tong (2011) that: The fermentation process to produce *Eco-Enzyme* solution takes a maximum of three months. Furthermore, the results of research from Chandra, et al (2020) state that: *Eco-Enzyme* is widely used, including for bath soap, dish washing soap and shampoo, with a ratio of 1 soap: 1 *Eco-Enzyme*: 8 water, adjusted for dosage.

The application process for the conversion of *Eco-Enzyme* into dishwashing soap is obtained through the use of fruit peels, palm sugar and water. This is as stated by Siska Alicia Farma, et al (2021) that: The process of making *Eco-Enzyme* comes from vegetable waste and fruit peels, brown sugar and water in a ratio of 3:1:10. This process takes a minimum of 90-100 days.

The application of the results of converting *Eco-Enzyme* into dishwashing soap, if used properly, can make it easier for people to meet and fulfill their needs and reduce or save on shopping expenses such as buying soap and other household necessities. However, in reality there are still some people who do not have knowledge about the benefits of *Eco-Enzyme* for household needs, apart from that there is also a lack of awareness among the public about how to use organic waste such as fruit waste and vegetable waste to make something useful. There is a lack of public knowledge about the extensive benefits of *Eco-Enzyme*, both as an environmentally friendly multi-purpose cleaner, it can also clean floors or replace mop fluid, clean toilets, kitchen surfaces, dishwasher soap or other eating utensils, can fertilize plants, and repel pests. Apart from that, *Eco-Enzyme* can also be used or used as a medicine to heal burns and itching.

Another problem is that it is not yet known how to apply the results from converting *Eco-Enzyme* into dishwashing soap. Based on this explanation, the author is interested in conducting research with the title: Application of *Eco-Enzyme* Conversion Results into Dishwashing Soap.

RESEARCH METHODS

The tools and materials used in this research were plastic containers, organic fruit waste such as

orange peel, papaya peel, pineapple peel and watermelon peel, palm sugar and clean water. More details can be seen in the following table:

Table 1. Research Tools and Materials

No	Tools/Materials	Function
1	Plastic Bottles/Containers	As a storage place for <i>Eco-Enzyme</i>
2	Orange peel, papaya, pineapple and watermelon peel	Ingredients for making <i>Eco-Enzyme</i>
3	of Gula	Mixed ingredients for making <i>Eco-Enzyme</i>
4	Clean water	Mixed ingredients for making <i>Eco-Enzyme</i>

Making *Eco-Enzyme* is based on the formula 3:1:10 (fruit/vegetable waste: palm sugar: water). The *Eco-Enzyme* ingredients used are watermelon peel, pineapple peel, papaya peel and orange peel (lime, sweet orange and large orange), the sugar used is brown sugar, the water used is mineral water, lerak. Then fermented for 3 months by opening the lid of the container once a week and stirring occasionally. After fermentation, the harvest from *Eco-Enzyme* produces a dark brown liquid with a strong sweet and sour aroma.

RESULTS AND DISCUSSION

Eco-Enzyme Conversion Results into Dishwashing Soap

a) Results of *Eco-Enzyme* Conversion with Lerak

Eco-Enzyme conversion uses lerak in a ratio of 10:1 and is fermented for one month. The results of the research show that the conversion of *Eco-Enzyme* with the addition of lerak is liquid, dark brown in color, has a distinctive strong sweet and sour aroma, and is slightly foamy.

b.) *Eco-Enzyme* Conversion Results with *Methyl Ester Sulfonate* (MES)

This converted dish soap is made by mixing *Eco-Enzyme* with *Methyl Ester Sulfonate* (MES) and water. The resulting product is placed in a plastic bottle that is not too large, reducing the possibility of contamination if the container is opened frequently. The results of the conversion of *Eco-Enzyme* with *Methyl Ester Sulfonate* (MES) produce a brownish color that is lighter than the color of *Eco-Enzyme*, has a sour aroma, and a thick texture and lots of foam (images of the results of this conversion can be seen in figure 1)

Application of *Eco-Enzyme* Conversion Results into Dishwashing Soap

The first treatment was using *Eco-Enzyme* as a dishwashing agent on plastic, can and glass plates with a dose of 10 ml each, where the initial condition was dirty, oily and smelly.

After applying *Eco-Enzyme*, it shows that the results of the *Eco-Enzyme* are still dirty, in this case oily and smelly. Then the application in the second treatment is the result of the *Eco-Enzyme* conversion using lerak on plastic, can and glass plates with a dose of 10ml each, with the initial conditions being dirty,

oily and smelly. After application, it shows that the dishes washed with *Eco-Enzyme* using lerak have not completely removed dirt, oil and odor in each treatment, while the final condition still leaves dirt and oil attached and has a slight smell.



Figure 1. Results of *Eco-Enzyme* Conversion into Dishwashing Soap

Meanwhile, the third treatment was the result of the *Eco-Enzyme* conversion using *Methyl Ester Sulfonate* (MES), on plastic, can and glass plates with a dose of 10ml each. In its initial condition, it is dirty, oily and smelly. The results of the application show that it is able to clean and remove both stuck-on dirt, oil and odor in each treatment. The result in the final condition is that the mat is clean, not oily or smelly. When compared with the Sunlight brand liquid soap sold on the market, it shows that there are similarities both in terms of cleanliness, mattness and smell.

Table 2. Dish Soap Application Results

No.	Indicator	EE	EE+Lerak	EE+MES	Sunlight
1.	Dirty	✓	✓	—	—
2.	Greasy	✓	✓	—	—
3.	Smell	✓	✓	—	—

Information:

✓ = (Dirty, Greasy, Smelly)

--- = Free from indicators

Discussion

Based on the research results, the application of the *Eco-Enzyme* conversion results into dishwashing soap is obtained through the use of fruit peels, palm sugar and water. Where the steps can be carried out

by preparing the materials and tools that will be used to make *Eco-Enzyme* into dishwashing soap; provide tightly closed plastic containers to determine the volume of water and other materials; measure the three ingredients based on a ratio of 3:1:10 (fruit/vegetable waste: palm sugar: water); Put water in a container according to its size, then add palm sugar that has been cut into pieces (it must not be cooked or melted in any way), then put in fruit or vegetable skins that have been cleaned and cut into small pieces or not too large so that during the fermentation process it can easily decompose or be destroyed; give the date of manufacture of *Eco-Enzyme* so that the harvest period can be known, namely three months; the fermentation process lasts for three months, but within a few weeks the lid of the container can be opened briefly to remove the gas that is starting to form, sometimes in the first month and you can also stir it so that the brown sugar mixes with the waste and water; after fermenting for three months, *Eco-Enzyme* is ready to be harvested; and when harvesting *Eco-Enzyme*, it is necessary to prepare a plastic container, plastic bottle, sieve or flour sieve or fine gauze and a plastic funnel; and *Eco-Enzyme* is ready to be used as dishwashing soap or other household needs. This is as stated by Siska Alicia Farma, et al (2021) that: The process of making *Eco-Enzyme* comes from vegetable waste and fruit peels, brown sugar and water in a ratio of 3:1:10. This process takes 90-100 days minimum.

Application of the results of the conversion of *Eco-Enzyme* into dishwashing soap, where after going through a fermentation process lasting three months, the resulting liquid is brown in color and has a very strong sweet and sour fermented aroma and the liquid is slightly thick. According to Imron (2020) *Eco-Enzyme* is the result fermentation of organic waste such as fruit and vegetable dregs, sugar and water. The characteristics of a good *Eco-Enzyme* are that it is dark brown in color and has a characteristic strong sweet and sour fermented aroma. This *Eco-Enzyme* converted dish washing soap is not sticky and easy to rinse and gives a fairly soft impression on the skin of the hands when used. This is confirmed by research results from Tang and Tong (2011) that: The fermentation process to produce *Eco-Enzyme* solution takes a maximum of three months. Furthermore, the results of research conducted by Yulie Neila Chandra, et al (2020) show that *Eco-Enzyme* is a liquid from the fermentation of organic waste in the form of fruit and/or vegetables, which is light brown in color, sometimes quite dark, and has a distinctive fermented aroma.

The application of the results of converting *Eco-Enzyme* into dishwashing soap, if used properly, can make it easier for people to meet and fulfill their needs and reduce or save on shopping expenses such as buying soap and other household necessities. Because people are able to convert their own *Eco-Enzyme* which is obtained from fruit peel waste and vegetable residues fermented for three months into dishwashing soap.

Based on the results of the research and discussion, the researcher can conclude that *Eco-Enzyme* dish washing soap has the characteristics of being brown in color and has a strong sweet and sour aroma typical of *Eco-Enzyme* and is a slightly thick liquid and can make it easier to apply as dish washing soap. Apart from that, this *Eco-Enzyme* converted dish washing soap is not sticky and easy to rinse and gives a fairly soft impression on the skin of the hands when used.

CONCLUSION

The research conclusion is that the application of the *Eco-Enzyme* conversion results has significant potential to be developed into an active ingredient for environmentally friendly dishwashing soap

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