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Ushering in the Age of Endemic

**THE 11TH INTERNATIONAL INNOVATION,
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D'SAVA: EDIBLE INSTANT FOOD SEASONING WRAP MADE FROM BIODEGRADABLE PLASTIC WASTE CASSAVA PEEL WITH ALOE VERA ADDITION AS ANTIOXIDANT

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ABSTRACT

Plastic waste is one of the biggest issues that has been going on for a long time and still has not been resolved up until now. The dependence of the world community on plastic waste makes the production of plastic waste continue to increase every year. Indonesia is the second largest contributor to plastic waste in the oceans in the world after China. The Indonesian Plastic Industry Association (INAPLAS) and the Central Statistics Agency (BPS) recorded that Indonesia's plastic waste product that was thrown into the ocean reached 3.2 million tons out of a total of 64 million tons of plastic waste per year. The purpose of this research is to make plastic that is edible and can also preserve food as an instant food seasoning wrap. Cassava peel waste can be used as packaging for biodegradable instant food seasonings that are zero-emission and are named D'Sava or biodegradable cassava. D'Sava can be eaten because it is rich in nutrients and contains high antioxidants from a mixture of aloe vera so that it can preserve food. D'Sava can replace the use of synthetic plastic which is very dangerous. A total of 1 baking pan with a size of 30 cm² can produce 28 units of packaging with a size of 4 cm². D'Sava will last longer as food packaging. Because of its ability to not getting exposed to direct air, it will be a good replacement for packaging that is made of synthetic plastic.

Keywords: *D'Sava, cassava peel, biodegradable.*

1. INTRODUCTION

Plastic waste is one of the biggest issues that has been going on for a long time and still has not been resolved up until now. The dependence of the world community on plastic waste makes the production of plastic waste continue to increase every year. Indonesia is the second largest contributor to plastic waste in the oceans in the world after China. The Indonesian Plastic Industry Association (INAPLAS) and the Central Statistics Agency (BPS) recorded that Indonesia's plastic waste thrown into the ocean reached 3.2 million tons, out of a total of 64 million tons of plastic waste per year. In 2021, Indonesians collectively produced 5.4 million tons of waste per year or 14% of the total waste, with the largest contribution being plastic waste (Muamar, 2022).

Nowadays, plastic waste has become an important topic of discussion, considering its impact on our world. Plastics in the aquatic environment can release harmful chemical compounds such as phthalates, bisphenol A, 4-nonylphenol, methyl tert-butyl ether (MTBE), formaldehyde, synthetic dyes, and volatile carbon compounds. These chemical compounds can

interfere with the physiological processes of the animal body in the aquatic environment. Another impact of plastic waste pollution is that it can cause an unhealthy environment. Plastic particles are toxic if they enter the soil, causing soil decomposers such as worms to be killed. Plastic that doesn't decompose in the soil will be toxic, even if it gets eaten by plants or animals. Another effect of plastic waste is that is difficult to decompose and can cause unpleasant odours and various diseases. In addition, plastic waste can also disrupt waterways that seep into the ground, causing water blockages and flooding effects.

The packaging of spices in instant food causes a large amount of plastic waste. The use of edible plastic in instant food seasoning wrap will reduce the impact of using ordinary plastic. Biodegradable plastic can be made from various natural materials, one of which is cassava peel waste. The abundant availability of cassava peel waste in Indonesia makes this biodegradable product from cassava peel waste the best solution to overcoming the use of plastic which is very harmful to the environment. Cassava peel is contained in each cassava tuber and its presence reaches 16% of the weight of cassava tubers. It is known that the production of cassava tubers in 2019 was 20.8 million tons, meaning that the potential for cassava peels in Indonesia amounts to 2.6 million tons per year. Consumption of cassava nationally continues to increase. In 1993, the national consumption of cassava was 10.7 million tons of cassava and in 2020 to 12.06 million tons or an increase of 16.67 per cent per year. Meanwhile, judging from the average from 2016 to 2020, the national consumption of cassava increased to 3.22 per cent (Muslim, 2017). This research aims to make edible plastic that can preserve food so that it can be used as a wrapper for instant food seasonings.

2. FINDINGS

Cassava peel is known as one of polymer groups that can be used as raw materials for biodegradable plastics. Raw material for instant food seasoning wrap from biodegradable plastic cassava peel waste is more environmentally friendly because it can degrade faster than non-degradable plastic. In comparison, ordinary plastic takes about 50 years to decompose naturally, while biodegradable plastic from cassava peel only takes 2 months to degrade naturally. Furthermore, this instant food seasoning wrapper can also be eaten or cooked because it is made out of natural ingredients that are rich in nutrients and will produce zero gas emissions and zero harmful waste. The mixture of aloe vera in plastic makes spices and food last longer because they contain antioxidants. The results of biodegradable plastic degradation from cassava peels can also be used as animal feed or compost. The waste does not produce chemical compounds that are harmful to the environment (Sara, 2018). The abundant availability of cassava peel waste provides enormous potential for the development of biodegradable plastic from cassava peel waste as a substitute for ordinary plastic food wrappers. D'Sava will last longer in food packaging because it is not exposed to direct air, so it is good to use as a substitute for packaging made of synthetic plastic.

This finding is called D'Sava or biodegradable cassava. D'Sava can replace the use of synthetic plastic which is very dangerous. It is known that one baking pan with a size of 30 cm² can produce 28 units of packaging with a size of 4 cm². Assuming the production of food packaging a day produces five packs, one pack contains 100 pcs. The total cost of goods sold Rp. 25.496 and the price of sale for a pack of 100 pcs is Rp. 45.000.

3. METHODOLOGY

3.1 Cassava Peel Starch Preparation

Cassava skin is peeled, and the white skin (inner skin) is taken. Cassava peels are soaked in salt water for 24 hours to remove the cyanide content. Cassava peels are dried in the sun for 3 days. The dried cassava peel is cut into small pieces to make it easier to grind. Cassava skin is mashed using a blender. The mashed cassava peel was sieved at a size of 100 mesh.

3.2 Manufacturing of Edible/Biodegradable Plastic

Making cassava peel starch is done by weighing 10 grams of cassava peel flour. Add 10 mL of glycerin and 10 mL of vinegar. A total of 5 grams of aloe vera is added to the solution. The solution is heated on a hot plate at a temperature of 80-90°C for 15 minutes while stirring (Sara, 2018). The thickened solution was transferred to a 30 x 30 cm baking pan. The mold is dried in an oven at a temperature of 60-70°C for 5 hours (Sara, 2018). After heating, cool it to room temperature so that the plastic can be removed from the baking sheet.

3.3. Printing

The plastic that has dried is then cut as a spice wrapper. Cut the plastic into a size of 4 x 8 cm. The plastic is folded to a size of 4 x 4 cm. Glue the right and left sides using food glue and leave the top. A total of 1 baking sheet can produce ± 28 units of packaged products.

4. CONCLUSION

Based on the analysis above, we can conclude that cassava peel waste can be used as packaging for biodegradable instant food seasonings with zero emissions. Also, D'Sava can be eaten because it is rich in nutrients and contains high antioxidants from a mixture of aloe vera so that it can preserve food. D'Sava can replace the use of synthetic plastic which is very dangerous. A total of 1 baking pan with a size of 30 x 30 cm can produce 28 units of packaging with a size of 4 x 4 cm. D'Sava will last longer as food packaging, because its ability of not getting exposed to direct air, so it will be a good replacement for packaging that is made of synthetic plastic.

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