

**BANASTIC-LIZER: FABRICATION OF ECO-FRIENDLY
PLASTIC FROM BANANA PEELS**

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ABSTRACT

Tons of plastic produced each year to fulfil human needs. However, the major issue arises on how to dispose of the plastic bags. Plastic bags contain chemicals originating from petroleum distillation products. Upon burning or burying those plastic bags, toxic chemical reactions can pose harms to the living things and the environment. Additionally, plastics need approximately around 500 years to completely decompose. Therefore, we introduce Banastic-lizer as a green plastic as the solution to these problems. This project enables the fabrication of the eco-friendly plastic material from banana peels which is biodegradable in nature and reduce the harmful effects of material decomposition to the Earth. In fact, the banana peels have antioxidant properties, fibrous structures and essential nutrients. As the results, the Banastic-lizer is safe for the application by consumers without giving any harmful side effects. Plus, it can be used as a fertilizer due to the high content of nutrients. This eco-friendly plastic has a chance to be commercialized due to its affordable cost. As a conclusion, the conservation of the environment can be achieved if we continue using the green and environmentally friendly products. With this project, we hope that it could be a kick-start towards the efforts of saving the Earth in the coming future.

Keywords: *Green plastic; banana peels; fertilizer; biodegradable*

INTRODUCTION

Global plastic production was estimated to be 367 million metric tons in 2020 (“EU Plastics”, 2020). This statistic shows that plastics has become one of the most important materials used in everyday basis. Plastic is used across almost every sector such as for packaging, in product manufacturing, in building and construction and others. There is already clear evidence that chemicals associated with plastic are potentially harmful to the environment. Among them are phthalates, poly-fluorinated chemicals, bisphenol A (BPA), brominated flame retardants and antimony trioxide. Upon burning or burying the plastic bags, toxic chemical reactions can leach out to have adverse effects on environmental and public health (Alabi et al., 2019). Another related issue is its tendency to clog the drain and causing water and sewage problems including degradation of marine habitat which eventually affects aquatic organisms. Therefore, many studies have been carried out by researchers to solve this global issue. One of the solutions is to use a biodegradable plastic. Biodegradable plastic is a plastic made from renewable sources such as corns, tapioca, potatoes, algae, and bananas (Ab Razak et al., 2020). This research focuses on a fabrication of eco-friendly plastic using banana peels as the main component to replace the conventional plastics from crude oil. Banana has been mentioned in Quran verse 29 Surah Al-Waaqiah, “And (banana)

trees layered (with fruit)” (Quran 56:29). Bananas are one of the most consumed and cheapest fruits worldwide. Additionally, the banana peels also contain cellulose, starch, pectin, and other valuable polymers. The high nutrients content are very useful for plant growth. Therefore, this study has an advantage in producing multipurpose green-plastic which can be used as fertilizer when disposed.

METHODOLOGY

The materials needed were banana peels, starch flour, glycerol, and water. For the first step, 4 banana peels were ground with addition of 250 ml water using a blender until they become a slurry. Next, the slurry was filtered using a strainer. At the same time, 50 g of starch flour was added into a bowl as a thickening agent. About 50 mL of water was added into the bowl to dissolved the starch flour. Next, the banana peel solution was mixed with the starch solution and heated with medium heat. The mixture was stirred slowly and 30 ml of glycerol was added drop-wise until the mixture thickened. After cooled down, the mixture was flattened on a plate and allowed it to dry under heat of the sun.

RESULTS AND DISCUSSION

The Banastic-lizer can be used as a carry bag, container, and wrapper. This eco-friendly plastic has high commercial value because of its affordable cost of production from banana peels, simple production process and rich in potassium content for plant’s fertilizer. The use of Banastic-lizer also can protect our environment from being polluted. It is non toxic, less usage of energy during the fabrication process, eco-friendly and more sustainable. Besides, it only takes a short time to decomposed as compared to conventional plastics. Figure 1 shows the fabrication of Banastic-lizer from banana peels and can acts as fertilizer when decomposed.

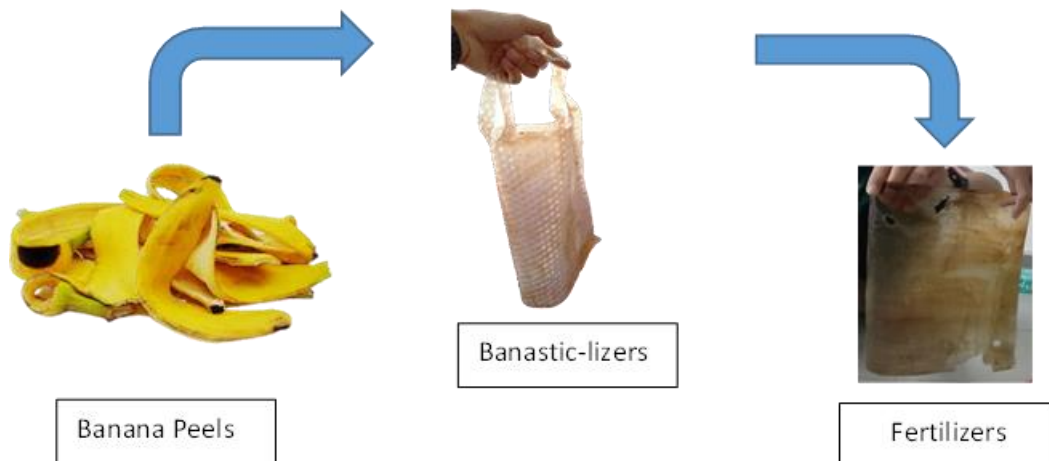


Figure 1. Banastic-lizers as eco-friendly plastic and fertilizers

CONCLUSION

As conclusion, this study successfully produced an eco-friendly plastic from banana peels and glycerol. The synthesized plastic also can be used as fertilizer due to the high nutrients content and biodegradable properties. Based on that, the waste from banana peels can be reused and disposed in a very great way. We hope that this low-cost innovation can solve one of the global issues related to plastic pollution. In future,



details study can be carried out to improve their durability without neglecting their biodegradability.

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