EDIBLE CUPS MADE FROM AGAR POWDER AND SEAWEED

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ABSTRACT

Plastics are proved to be a big problem to human, environment and also marine life. One of the alternatives is to produce natural based polymer composites using biodegradable polymer which are extracted from seaweed and agar. Seaweed and agar have their own uniqueness which is low in cost, good degradation rate and environment friendly that can replace plastic as it can be consumed safely by animals especially the marine life, which in a way means that it gives back to the nature, thus will preserve the environment from the said disaster. We are familiar with plastic and glass cups for serving tea, coffee and chocolate, but we need a safer and environmental friendly option like edible cups. Since it is edible and biodegradable so no waste is generated. Our objectives for this project is to create a biodegradable cup using agar powder and seaweed and to examine the durability of agar powder cup and seaweed cup. For the method of this project, firstly we prepare the agar solution and the next process is the extraction of seaweed. Then we prepare the seaweed solution and lastly we observe the result.

Keywords: seaweed, edible, plastics, agar, biodegradable

1. INTRODUCTION

The terms of bioplastic refer to the bio-based origin of a plastic. This terms are about biodegradable or how easily the plastic going to distinguish and will not be a wasted item. In this topic, the main objective is to prevent any disaster could happen by wasted item to the world. In that way, replacing normal plastic to the edible cup is one of ways to prevent wasted item keep dumped in this world. Edible cups that made from agar powder and seaweed are highly recommended to create a new era to stop manufacture of normal plastic. The durability of these edible cups needs to think about for general used and would be useful to the people. If the durability is high, it means more resistant to microwave radiation, less brittle and duration. Edible cups used for food packaging and more to the food industries. So, it could give lot of advantages to the people such as costs effective, limit the effect of food chains and free chemical in the products. Biodegradable materials are materials that can be broken down by microorganisms such as bacteria, fungi that into water, naturally occurring carbon dioxide, methane and biomass. There was a lot of edible cups' type nowadays. Some made from starch, natural waste that blended in environment, unsaturated fat and more. But, among of those alternatives, the best resources to create a biodegradable plastic is seaweed as it manages to lower of huge investment in land, chemicals and more. Seaweed could grow without any fertilizers unlike other plants, also cost effectively and most durability to be used for this generation. All these things need to fulfill the efficiency to replace normal plastic so, people would prevent the environment pollution that made from plastic waste.

2. MATERIAL AND METHOD

Firstly, we prepared agar solution by using 100 g of unflavored agar powder that was boiled into 200 ml

water. Next, the extraction of seaweed where 50 g of raw seaweed boiled in water and filtered to get the extraction. The seaweed extract then mixed with agar solution to get seaweed solution. These solutions were poured into mold and refrigerated for 1 hour to get the best results.

2.1. Discussion

For the first trial of making edible cups, the result is too soft and shattered, so the water has been decreased to 300 ml. However, it started to leaked and shattered, so on the third attempt the water decreased to 200 ml but it only could stand less than 10 minutes. On the final attempt, seaweed solution was added into agar solution for testing the toughness of the cup. It shows a good result where the cup could stand by itself for a longer time without being leaked and shattered. Moreover, after water has been poured into the cup, consumer could drink normally without changing the quality and taste of the water. However, few things need to improve such as the physical shape of the cup need to be tidy up by choosing a proper mold. To conclude, the lesser the amount of water used, the rigidity will increase whereas the addition of seaweed made the cups even stronger.

3. RESULTS

Edible Cups Trial versus Ingredients Used (Ml)

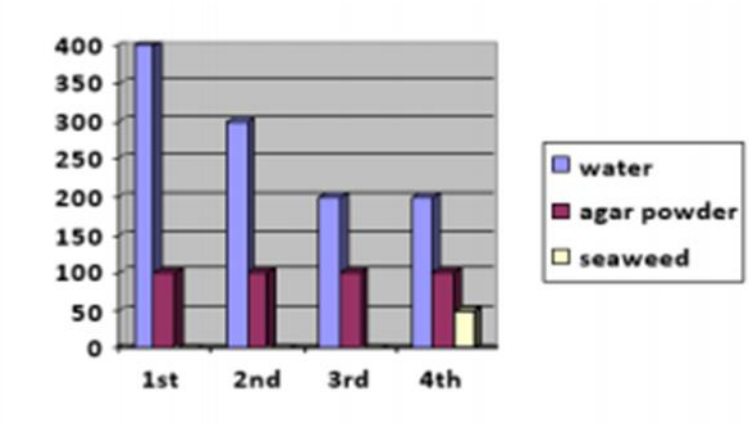

Figure 1. Graph edible cups trial vs ingredients used.

Table 1. Ingredients Used On Each Attempts

	Ingredients		
	Water (ml)	**Agar Powder (g)**	**Seaweed (g)**
First	400	100	0
Second	300	100	0
Third	200	100	0
Fourth	200	100	50

Figure 2. Final Result of Edible Cup
Reference: Nur Izzah Syafiqah, June 27, 2020

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