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The Extent of the Utilization of Fruit and Vegetable Peel Waste Treatment into a Generic Wound Medicine

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ABSTRACT

The majority of waste in the form of food scraps is a serious problem today, because it rots quickly and gives an unpleasant smell when inhaled. Global data shows that fruit and vegetable waste is the largest contributor to the world's food waste. It turns out that organic waste also has an environmental impact if not managed properly, such as producing harmful gases such as methane gas. The explosion incident at the Final Landfill is a poor example of organic waste management and producing methane gas. To overcome this, organic waste is generally processed into compost, but it is less known that organic waste, especially fruits and vegetables, can be used as natural wound healers through eco enzymes. Therefore, the service team assists housewives in Semarang in processing organic waste into eco enzymes that can help heal wounds, including in diabetics. This activity was carried out for 6 months, involving preparation, procurement of materials, assistance in making eco enzymes, monitoring, socialization, and evaluation. The results of the evaluation showed that participants were able to process organic waste into eco enzymes that are useful as natural wound healers, which can help diabetics. This is a positive step in sustainable waste management while helping those in need of better wound healing.

Keywords: Eco Enzyme; Fruit Waste; Vegetable Waste; Zero Wash

INTRODUCTION

Data from the National Waste Management Information System owned by the Ministry of Environment and Forestry, shows that the total waste pile in Indonesia reached 19.14 million tons in 2022. Based on the type, Indonesian waste is dominated by food waste with a composition of 41.69%. In general, people assume that organic waste is safe for the environment because it can decompose, but it turns out that organic waste also holds dangers

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if not managed properly. The leachate liquid produced by organic waste can reduce the quality of the soil and water around the garbage pile. In addition, organic waste that is not managed properly also produces methane gas and causes explosions, especially when the organic waste is in a closed condition, lacking sunlight and oxygen (Joshi et al., 2012). This is just like what happened in the Final Landfill.

The accumulation of methane gas after rain poured for days triggered an explosion that resulted in landslides and piles up dozens of houses in Cilimus and Gunung Aki villages which are approximately 1-kilometer away from the landfill. A total of 157 people were hit by the avalanche. The 8.5-hectare land was also damaged by an avalanche of thousands of cubic tons of waste. In an effort to prevent similar incidents from happening again, several communities and organizations have begun to take innovative steps to process organic waste into useful products. One of the most common activities is the processing of organic waste into compost. Not many people know that organic waste, especially fruit and vegetable waste, can also be used as a natural wound healer. Fermentation of fruit and vegetable skin residues can help accelerate the healing of wounds on the skin. Statista's global data in 2017 shows that fruit and vegetable waste itself is the largest contributor to the food waste category, which is around 38% of the total food waste in the world (Bisht et al., 2020). Therefore, the service team provides assistance in processing organic fruit and vegetable waste into wound medicine for housewives in housing.

There has been a lot of community service in processing organic waste into eco enzymes. To accompany the processing of household waste into eco enzymes. assisting in making eco enzymes for residents and empowering housewives in villages to utilize household-based fruit and vegetable waste into eco enzymes. socializing and actualizing the production of eco enzymes in Housing provides learning in the village. Utilizing Household Organic Waste at the Berkah Abadi Village Waste Bank to be processed into eco enzymes. Through this service activity, the service team wants to participate in introducing eco enzymes, especially for wound healing, including diabetic wounds. In general, wounds in diabetics are a serious problem. Diabetes can interfere with the wound healing process because it reduces blood flow to the wound area and damages the nerves that play a role in the healing process.

This can cause wounds that are difficult to heal, and can even develop into serious infections and other complications. Based on data from the World Health Organization (WHO) in 2021, the number of people suffering from diabetes in the world is estimated to reach 422 million people. Injuries in people with diabetes can result in amputation and have a significant impact on their quality of life. Therefore, innovations such as the use of eco enzymes from organic waste of fruits and vegetables as natural wound healers have the potential to help diabetics in the process of healing their wounds (Pascoalino et al., 2021). Eco enzymes can

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provide additional benefits by accelerating wound healing on the skin. This activity is expected to be a valuable contribution in efforts to overcome wound healing problems, especially in diabetics, while reducing the impact of organic waste on the environment.

RESEARCH ELABORATIONS

The service activities were carried out within 6 months with the following implementation methods: Preparation At this stage, the team coordinated with partners, namely the Dasa Wisma Group. Coordination includes the number of participants, survey of the types of vegetable and fruit waste partners, implementation time. Procurement of Raw Materials and Tools The next stage is to prepare the necessary raw materials, namely fruit and vegetable waste, brown sugar and water (El-Sawi et al., 2022). Fruit and vegetable waste is collected by partners while brown sugar and water are prepared by the service team. The amount of brown sugar and water is adjusted to the amount of vegetable and fruit waste collected by the partners. The tools needed are a closed plastic container and a closed plastic bottle are also prepared by the service team (Mohd Basri et al., 2021). Assistance in making organic wound healers The next stage is assistance with eco enzyme liquids as natural wound healers. First, organic waste (fruit and vegetable peels) is weighed. Then adjust a lot of sugar and water with the following composition: 3 parts organic fruit and vegetable waste, 1 part brown sugar and 10 parts water. The ingredients are then put in a plastic container that has been prepared beforehand, stirred and sealed tightly.

The process of fermenting fruits and vegetables to become eco enzymes as natural wound medicine takes at least 3 months. In order for the fermentation harvest to be in accordance with expectations, it is necessary to carry out monitoring. The gas formed in the first two weeks is quite a lot. In order for the gas to disappear, the lid of the container needs to be opened and stirring the liquid then close it again tightly. The container can be opened and closed once a week after the gas formation has decreased. In addition, it is also necessary to monitor whether worms, white mushrooms or black solutions appear during the fermentation process. If this happens, the solution needs to be re-sugared as much as it was originally. The fermentation process is said to fail when black mold or a foul-smelling solution appears. 5. Socialization of how to harvest eco enzymes and their use as wound healers Socialization is carried out three months after the mentoring, which coincides with the harvest period of eco enzymes. The fermentation process is said to be successful if the solution is cloudy brown and has a strong sweet and sour aroma. At harvest, the solution is filtered using a cloth. To facilitate storage and use, the solution is transferred to a plastic bottle that has been washed clean, then the bottle must be tightly closed. Storage of eco enzymes should be at room temperature in a shady area,

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not exposed to direct sunlight. 6. Evaluation of Evaluation Activities is carried out using the Forum Group Discussion (FGD) method. The evaluation aims to find out the obstacles faced by partners.

RESULTS AND DISCUSSIONS

Coordination between the team and partners will be carried out in April 2023. From this coordination, the following information was obtained: The number of participants who could take part in the mentoring was 10 people. The estimated accumulation of the type of vegetable and fruit waste is 500gr/day. The implementation of the collection of raw materials for vegetable and fruit waste was agreed between April 10 and 15, 2023.

Figure 1

On April 15, 2023, assistance was provided in the manufacture of eco enzymes. Before the assistance, the collected fruit and vegetable waste was weighed to determine the water and sugar needs. The weighing results showed that 3000 g of fruit and vegetable waste was collected. So it is necessary to prepare 1000 g of sugar and 10,000 ml of water. The ingredients are then put in a plastic container that has been prepared beforehand, stirred and tightly closed. On the lid, the harvest date label is given, which is July 15, 2023.

Furthermore, monitoring is carried out so that the harvest is obtained according to expectations. During monitoring, no white worms/fungi or black solution were found during the fermentation process. Harvest should be possible on July 15, 2023. However, due to the busyness of the team and partners, the harvest can only be carried out on August 1, 2023. The fermentation process produces a cloudy brown solution with a strong sweet and sour flavor. Thus the harvest can be said to be successful. After the implementation of the mentoring, the service team conducts an evaluation to find out the obstacles faced by the partners. The results of the FGD are as follows: Partners are able to make eco enzymes, but they are still constrained

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by the consistency of managing organic waste of vegetables and fruits. Mitra opened his mindset that processing organic waste from vegetables and fruits into eco enzymes has many benefits. Mitra opens his mindset that processing organic waste from vegetables and fruits into eco enzymes can save household expenses

CONCLUSIONS

This activity shows that the fermentation process to produce eco enzymes is running well and can be said to be successful, characterized by the formation of a cloudy brown solution with a strong sweet and sour aroma. Although the harvest was delayed from the planned date, the fermentation results corresponding to the success indicators showed that the methods applied were effective. Monitoring carried out during the fermentation process also did not find any contamination that could interfere with the quality of the eco enzymes produced.

Evaluation through FGD revealed that partners have been able to understand and practice the production of eco enzymes. However, the main challenge faced is to maintain consistency in the management of organic waste of vegetables and fruits as raw materials. Despite these constraints, there has been a positive change in the mindset of partners, who are aware of the various benefits of processing organic waste into eco enzymes, including the potential savings on household expenses. This indicates that the assistance that has been carried out has succeeded in opening up insights and improving the skills of partners in eco enzyme production, although there is a need for follow-up to address the issue of consistency in raw material management.

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