

**CONFERENCE PROCEEDING****POP MUNGIL (Paper Soap from Mangosteen Peel Extract):
An Innovation of Soap to Avoid COVID-19 using Saponification
Process**

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ABSTRACT

Covid-19 becomes a global disease that can change many dimensions of human life. In 2022, according to the data from World Health Organization (WHO), the number of covid-19 cases in Indonesia is 6.19 million people. One impact from this case is the change of Indonesia into a new normal era. The existence of a new normal leads to a new obligatory habit which is washing hands. Whereas Rasulullah decreed to wash our hands after waking up from sleep as narrated by Muslim. Using soap and water while washing our hands is the effective technique or method to kill germs. The purpose of this research is to make innovations from basic soap into organic paper soap. This innovation is expected to be an effort to make it easier for people to use soap. Mangosteen peel contains antibacterial substances such as xanthone, tannin, and flavonoid which is 95% effective in inhibiting bacterial growth. Based on the data of Ministry of Environment and Forestry of Indonesia, it mentioned that 57% of Indonesia waste is organic waste. Therefore, this research can also reduce the amount of organic waste which is the mangosteen peel into innovated paper soap using saponification reaction.

Keywords: COVID-19, paper soap, mangosteen peel, saponification

INTRODUCTION

The COVID-19 pandemic that hit Indonesia has brought many changes to society. One of the habits caused by the presence of COVID-19 is washing hands. In the new normal era, hand washing is something that must be done either before or after activities. According to a study by the US National Institutes of Health, washing hands with soap and water is more effective at removing bacteria than water alone.

Types of soap is divided into two, namely organic soap and inorganic soap. Organic soap is a bath soap made from natural ingredients without a mixture of chemicals. Organic soap has a liquid substance which is hygroscopic, or absorbs and binds water vapour and air, therefore it can make the skin moist, not dry, and soft for sensitive skin (Widiastuti, 2022). To make it easier for people to use soap, we innovate liquid soap in general into organic paper soap. In this study, mangosteen peel is used as an ingredient in making soap. Mangosteen peel contains flavonoids, tannins, saponins, and xanthenes which are useful as antioxidants and antibacterial (Attazqiah, 2017). In 2019, the Ministry of Environment and Forestry noted that out of 67.8% of the existing landfill, 57% of it was organic waste. Therefore, this innovation is carried out as an effort to utilize and reduce organic waste.

The process of making soap is known as saponification reaction. In this study, the saponification reaction was carried out by reacting an alkaline solution into oil with

a mixture of mangosteen peel extract. Thus, this study aims to determine the saponification reaction that occurs in the product manufacturing process, the effect of the amount of base used and the stirring time on the degree of acidity (pH) contained in the product, and the response of the community to the product through hedonic testing.

MATERIALS AND METHODS/ METHODOLOGY

The methodology of this research was carried out at Ar-Rohmah Putri IIBS Campus 2 Malang by using a chemical process, namely saponification. The saponification reaction carried out was focusing on the reaction between base and oil combined with mangosteen peel extract. The effects of the amount of base, stirring time, and the degree of acidity (pH) on the product were observed. The base used was potassium hydroxide (KOH). In this study, the independent variables used and observed were the amount of base and stirring time with the dependent variable being the degree of acidity (pH). The variation of stirring time is 20 minutes, 25 minutes, and 30 minutes. And the amount of base used is 15 mL, 20 mL, and 30 mL. The research data measured were the degree of acidity which was carried out using measuring devices, pH paper, and hedonic tests which were carried out by distributing questionnaires to several respondents.

RESULTS AND DISCUSSION

This study aims to create a product innovation which would be packaged in a small and thin form resembling a sheet of paper. The process of making this product implemented a saponification reaction as the basis for making paper soap from mangosteen peel extract. There were several things to be considered in the saponification reaction, beginning with the dissolution of KOH which was a strong base as one of the main ingredients in the saponification process. Dissolution of KOH could cause a reaction that produces heat indicating an exothermic reaction. Heating the KOH and oil was an important principal in the saponification reaction. Accelerating the reaction could be done by increasing the heating temperature. Soap making generally uses temperatures ranging from 60 °C - 80 °C (Dyartanti, 2014). The heating temperature should not be too high because it could cause the oil to oxidize so that the colour would become brown.

PH Test Results

PH testing on liquid soap was carried out to determine the quality of the soap in avoiding if from causing problems on the skin. The skin could adapt to products with a pH of 8.0 - 10.8 ((Frost, 1982). The data diagram shows the effect of the amount of KOH and stirring time on the degree of acidity (pH) of the product. There were 3 samples where the first sample had a KOH amount of 15 ml with a stirring time of 20 minutes. The second sample had 20 ml of KOH with a stirring time of 25 minutes and the last sample had 30 ml of KOH with a stirring time of 30 minutes. Based on experimental data, it showed that the first sample had a pH of 7.8, the second sample shows a degree of acidity with a pH of 8.5 and the last sample showed the highest PH of 9.1. The conclusion obtained was the longer the stirring time and the amount of KOH, the higher the pH value. (Wijana, 2009).

Hedonic Test Results

The hedonic test on soap aimed to determine the respondents' preferences by using human senses (Mulyani, 2016). Parameters tested were shape, colour, tightness and aroma (Maripa B. R., 2014). In the test results obtained from the distribution of questionnaires to 40 respondents, the hedonic scale used in this test was 1-3, in which; scale 3: very like, scale 2: quite like, scale 1: do not like. Based on the assessment of the shape, respondents showed that 80% of the them liked the shape of the product. The colour of the product was white because it was made from soluble paper. The most valued quality trait was aroma (Pangesti, 2021). The product produced a vanilla aroma resulted from the addition of vanilla essence to the product. Respondents quite like the aroma of the product with a percentage of 78%. Colour is a big attraction for non-food products (Pangesti, 2021). The colour of the product was white as it was made of soluble paper. Respondents quite like the colour of the soap product with a percentage of 82%. According to the respondents, the viscosity produced by soap was 76%. We may conclude that the product could accepted by the public with an average percentage.



Figure 1. *The Effect of Total KOH and Stirring Time on the Degree of Acidity of PH*

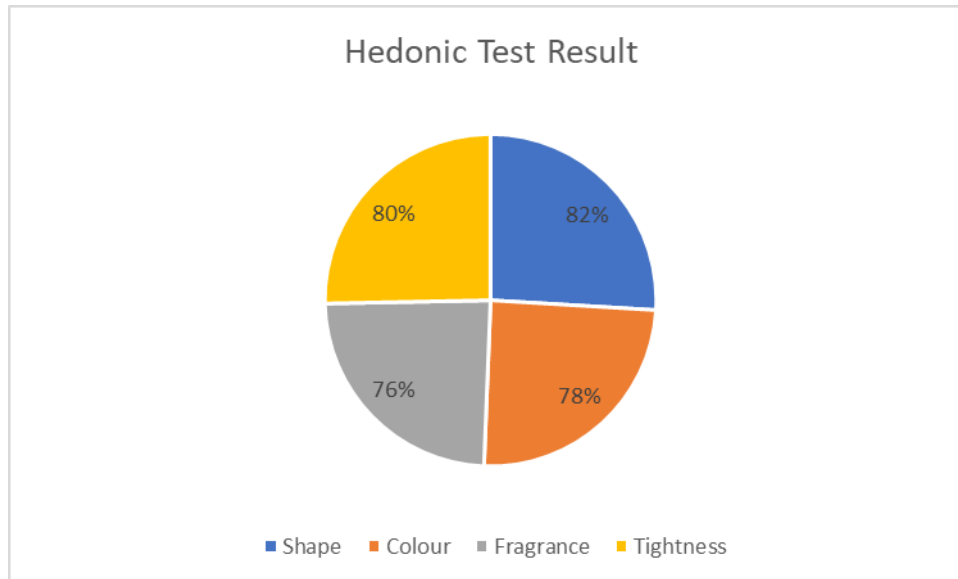


Figure 2. Hedonic Test Results

CONCLUSION

Based on the results of the research that have been done, it can be concluded that:

- 1) The process of making liquid soap can be done by saponification method with mangosteen peel extract as the main ingredient for making paper soap.
- 2) Analysis of consumer interest in paper soap with mangosteen peel extract using a questionnaire showed that the respondents quite liked the innovation of paper soap from mangosteen peel extract.

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