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Homemade Soap with *Vitis Vinifera* Extract Using Framing Time

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Abstract: Natural soap is one of the products that do not use chemicals that people need to clean the body and maintain healthy skin. Vitis vinifera and olive oil contain antioxidants and antimicrobials that are useful for brightening and moisturizing skin, increasing skin cell turnover, and making skin healthier. This research aims to obtain natural soap made from olive oil with the addition of grape extract (Vitis vinifera). The research method includes the process of making grape extract soap with varying framing times (3, 5, and 7 days), then the grape soap is stored for 4 weeks followed by analysis of pH levels, crack tests, and organoleptic tests including texture, color strength and foam. The final pH test results were in the range of 9.0-11.0 which were checked in the first seven days. This soap has texture ranges from 2.50 (slightly soft) to 3.84 (hard), soap color ranges from 3.15 (slightly interesting) to 4.00 (interesting), and foaming power ranges from 3.00 (slightly foamy) to 3.50 (foamy).

Keywords: Framing time; Homemade soap; *Vitis Vinifera*

Introduction

It should be noted that maintaining healthy skin is an essential thing to do because the skin is the outermost organ of the body that is most often exposed to physical and chemical substances which will cause problems with tissue damage to the skin (Panjaitan et al., 2015). Some of the causes that make facial skin unhealthy include consuming unhealthy food, lack of rest, heavy physical activity, outdoor activities that expose facial skin to free radicals, sunlight, dust, cigarette smoke and air pollution which can cause problems with facial skin such as dullness and premature aging of the skin so that the skin loses its elasticity and wrinkles appear (Michalak, 2022; Wölfle et al., 2014; Jadoon et al., 2015; Nakai & Tsuruta, 2021; Hernandez et al., 2021).

The product that people need to clean the body and maintain healthy skin is a soap. Soap can clean the skin from stuck dirt is a forerunner detergent (Chirani et al., 2021). Solid soap is formulated by chemically reacting sodium base and fatty acids from vegetable oils or fats through a saponification process (Rabani, 2019).

Commercial soaps in circulation generally contain detergents which can cause side effects such as sensitive and dry skin becoming drier and even the skin can become irritated. Moreover, detergents also produce waste that is harmful to the environment (Bandala et al., 2021). Meanwhile, natural soap or homemade soap does not use chemicals, so it can make the skin moister and more environmentally friendly. Nearly all natural soaps produce no waste or toxic byproducts. Besides that it requires little energy in the production process; thus, they are more compatible with nature (Maotsela et al., 2019; Medhiatika, 2021).

The basic ingredients needed for making natural soap are coconut oil, palm oil, olive oil and alkali (Chirani et al., 2021; Konkol & Rasmussen, 2015). Furthermore, other plant extracts can be added which have many benefits for the skin (Antonić et al., 2020).

The effectiveness of soap in protecting the skin can be further increased by adding ingredients containing

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bioactive components. One of the commonly used bioactive components is antioxidants (Thirunavukkarasu et al., 2023; Pai et al., 2014). Antioxidants such as flavonoids, vitamin A, vitamin C, vitamin E, polyphenols, and glutathione are found in many natural ingredients such as various types of fruit. The researchers have made soap by adding antioxidants from natural ingredients including strawberries (Altifani, 2023), dragon fruit (Purwanto et al., 2021). Furthermore, other bioactive components commonly found in soap are antibacterials such as saponins, tannins, alkaloids, flavonoids, and essential oils. Natural antibacterial ingredients that have been added to soap include orange leaves, and noni leaves which contain flavonoids, alkaloids, and saponins (Sumbung et al., 2023; Noviyanto et al., 2020), and lemongrass leaves which contain essential oils (Noviyanto et al., 2020; Bella et al., 2022). Essential oils can inhibit the growth of bacteria on the skin and give soap a distinctive aroma.

Grapes (Vitis venifera) have good benefits for skin health. Phytochemical compounds as bioactive compounds found in grapes are polyphenols, anthocyanins, flavonoids, stilbenes, phenolic acids, proteins, fats and vitamin C (Goufo et al., 2020). Antioxidant compounds help prevent cell components from experiencing oxidative damage due to free radical species (Zeghad et al., 2019; Azab et al., 2019). The benefits of olive oil for beauty are that it increases skin cell turnover, the skin becomes no longer thin, smooth and not oily, healthy and elastic, as well as eliminates facial lines and reduces black spot (Iswandar & Rosalina, 2022).

This research aims to produce natural and environmentally friendly homemade soap using grape extract and olive oil.

Method

The research method used is experimental using descriptive analysis, so it is hoped that it can provide information regarding the manufacture of solid soap using palm oil, olive oil and the addition of the active ingredient grape extract.

The materials in this research were grapes (Vitis vinifera) 500 gr, olive oil 450 ml, palm oil 450 ml, distilled water 250 ml, NaOH 122 gr. The tools used include containers, spatulas, mixers, measuring cups, sieves, molds, scales, and knives. Universal test paper used as pH testing tool.

The step for making grape soap is 122 grams of NaOH is carefully poured into a container filled with aquades gradually while stirring until all the NaOH is dissolved. Then cool the solution to a temperature of 30-35^0 C. While cooling, prepare a mixture of olive oil and palm oil in appropriate quantities. Then the grapes are mashed and filtered to get the extract.

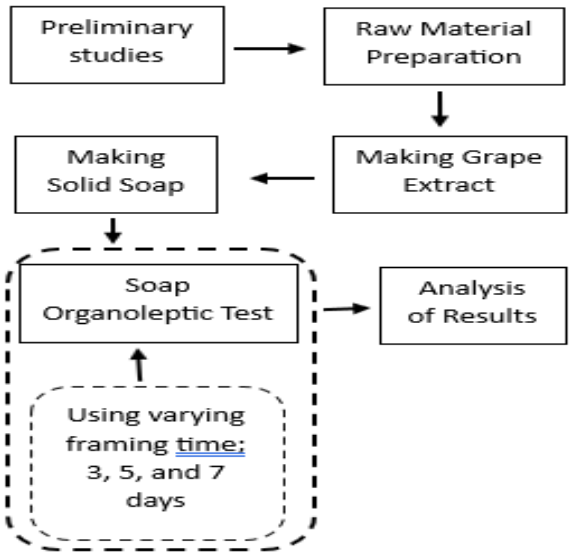

Figure 1. Research flow

The cold NaOH solution is slowly poured into the oil. Then stirred using a mixer. If the mixture starts to thicken a little, add the grape extract and stir again until thickened. Stirring was stopped when the mixture reached the residual mark.

Next, pour the soap mixture into a mold that has been covered with plastic and put it in the refrigerator for a day. Then it is taken out and placed at room temperature, then the pH level, cracking, texture, color, and foaming power of the soap on days 3, 5 and 7 are explained.

After 14 days, the soap is cut into pieces according to your wishes, then left at room temperature for approximately 2 weeks, and continues with the packaging process.

Result and Discussion

pH Level of Grape Soap

An important parameter used to assess the suitability of soap for use as bath soap is the degree of acidity or pH. In general, soap is alkaline in water solution because soap is a salt of a weak acid (fatty acid) and a base. Soap has an alkaline pH generally ranging from 9.3 to 10.7 (Dlova et al., 2017). The high and low pH of soap is influenced by the saponification process during soap making. The high pH value of soap is obtained from the hydrolysis reaction in the saponification process. This can be overcome by adding excess fat or oil. However, adding fat or oil will reduce the hardness of the soap (Habib et al., 2016).

Table 1. The pH Content of Grape Soap

Framing time	pH
3 days	9
5 days	11
7 days	11

The pH data of grape soap in this study are shown in Table 1. The research results show that the pH value of solid grape soap in the farmming time 3 days is 9, but in the farmming time 5 days and 7 days the pH value is constant at 11. This result meets the requirements. The safe pH value for soap is 9 – 11.

According to SNI 06-3532-1994, there are no fixed quality standards for the pH value of bath soaps since each consumer can adjust the dosage. Many soap products have different pH values. Generally, soaps sold publicly have a pH value of 8 to 11 (Prabowo & Siswanto, 2021). The normal pH for soap is 9-11 (Prabowo & Siswanto, 2021; Agustini & Winarni, 2017).

Because bath soap produced through a cold process will not be able to reach a normal pH or 7. If the pH of the soap is lowered to 7, the soap will separate again into oil and alkaline water. Soap that has a pH of 9 – 10 is a place that bacteria and microbes don't like, so there is no need to add antibacterial substances to the soap (Setiawati & Ariani, 2021). Soap with a high pH is caused by incomplete hydrolysis due to the saponification process. For overcome this is by adding excess fat or oil or other fattening ingredients to reduce the hardness of the soap (Vivian et al., 2014).

Crack Level of Grape Soap

The level of soap cracking is influenced by several factors, such as the shape of the bar soap, the degree of deviation during molding, the composition of the amount of fragrance, and additional ingredients. There are two types of cracks, dry cracks, and wet cracks. Dry cracks are caused by gaps resulting from air entering the soap during final pressing. Wet cracks occur in bar soap during washing and usually cause crack lines in the bar soap (Rabani, 2019).

The crack test for grape soap in this study was wet cracking. The soap was used until its weight was reduced to 3/4 of its initial weight, then soaked in water for 1 hour, then removed and dried for 24 hours, make sure the surface of the soap was dry, then look for cracks.

Table 2. The Crack Level of Grape Soap

Framing time	Crack
3 days	2
5 days	1
7 days	1

Notes: 1 = no cracks, 2 = slight cracks (less than 3), 3 = cracks, 4 = Severe cracks (more than 2 mm).

Table 2 shows that with a framing time of 3 days the soap experienced slight cracking. Then no cracks were found in the soap for 5 days and 7 days of framing. This explains that the longer the framing time, the lower the crack level.

Organoleptic of Soap Color

One element that can be used as an indicator of soap quality is color. Organoleptic soap color is assessed based on the color level of the soap produced without the addition of coloring agents. The average organoleptic results of wine soap color with long framing time treatment can be seen in table 3.

Table 3. Organoleptic Color Average of Grape Soap

Framing time	Color
3 days	3.15
5 days	3.59
7 days	4.00

Note: 1 = not interesting; 2 = less attractive; 3 = slightly interesting; 4 = interesting; 5 = very interesting.

Table 3 shows the average organoleptic results for color with 3 days framing time of 3.3 (slightly interesting), 5 days framing of 3.5 (slightly interesting) and 7 days framing time of 4.0 (interesting). The color of this grape soap comes from the color of real grapes. The longer the framing time, the more attractive the soap color will be because the dyes used are natural dyes so grape soap will be safe to use. Color has an attractive effect on consumers (Nurfadilah, 2019).

Organoleptic of Soap Texture

Organoleptic soap texture is measured by seeing and feeling the texture or appearance of the soap produced and then assessed based on an acceptance scale. The average organoleptic texture test results on grape soap with varying framing times of 3 days, 5 days and 7 days can be seen in table 4.

Table 4. Organoleptic Texture Average of Grape Soap

Framing time	Texture
3 days	2.50
5 days	3.25
7 days	3.84

Notes: 1 = very soft; 2 = soft; 3 = slightly soft; 4 = hard; 5 = very hard.

Table 4 shows the average organoleptic test results for the texture of grape soap with a 3 day framing time of 2.50 (slightly soft), a 5 day framing time of 3.25 (slightly soft), and a 7 day framing time of 3.84 (slightly soft to hard). The texture is related to the water content contained in grape soap (Prasetiyo et al., 2020). The texture of the soap formed varies due to the length of the soaping process, the less the soaping process, the thinner

the resulting soap mixture will be and the oil and alkali will not be mixed evenly so the oil will not be mixed and not completely saponified (Rabani, 2019).

This research uses olive oil. The saturated fatty acid contained in olive oil is oleic acid which has a softening function. With a high content of oleic acid, water and evaporation agents, it produces transparent soap that is not too hard and flexible (Widyasanti & Rohani, 2017).

Figure 2. Grape soap on 7 day

Increasing the water content will produce a softer texture. This shows that the length of framing time affects the texture of the soap because the water content of the soap decreases as the framing time changes. Furthermore, the addition of grape extracts also affects the level of hardness of the soap formula being made. In accordance with previous research which revealed that sucrose is a nonionic material that is free and has emulsifying properties (Pine et al., 2022).

Organoleptics of Soap Foam

The organoleptic test for soap foam aims to determine the level of resistance of soap foam. Organoleptic testing of the amount of foam in soap is carried out by washing hands using grape soap and then measuring the amount of foam produced based on the acceptance scale. The average results of the organoleptic test for the foaming power of various wine soaps with a framing time of 3 days, 5 days, and 7 days can be seen in table 5.

Table 5. Organoleptic Foam Average of Grape Soap

Framing time	Foam Strenght
3 days	3.00
5 days	3.33
7 days	3.50

Notes: 1 = no foam; 2 = less foamy; 3 = slightly foamy; 4 = foamy; 5 = very foamy.

Table 5 shows the average organoleptic test results for wine soap foam with a 3 day framing time of 3.00 (slightly foamy), a 5 day framing time of 3.33 (slightly foamy), and a 7 days framing time of 3.50 (foamy). Foam is one of the parameters in determining the quality of soap. The characteristics of the foam are influenced by the fat content contained in grape soap (Agustini & Winarni, 2017). One of the ingredients that function to produce foam in soap making in this research is VCO because VCO has a high content of lauric acid and myristic acid, it can produce a lot of foam (Widyasanti et al., 2017).

After going through various pH level testing processes, crack tests, texture tests, and various organoleptic tests, the soap is left at room temperature for approximately 2-3 weeks and continues with the packaging process.

Figure 3. Soap on the packaging

Through organoleptic tests it is known that the soap produced has good quality standards. The basic ingredients for making this soap come from natural ingredients so the production process only requires a little energy, making this soap more environmentally friendly (Maotsela et al., 2019).

Adding grape extract to natural soap will have a good effect on the user's skin because grapes contain antioxidants and antimicrobials (Karageçili et al., 2023). In the process of making natural soap, small producers and households can easily produce natural soap using simple and easily available ingredients. Furthermore, you can also add other natural ingredients according to the needs of the user's skin (Antonić et al., 2020).

Conclusion

Based on the analysis results, the pH level of grape soap ranges from 9.0-11.0. Based on the analysis results, the average crack in grape soap ranges from 1 to 2 (no crack and a little crack). Based on the results of the average organoleptic test analysis, the color, texture, and foaming power of grape soap show significantly different. The average value of grape soap color analysis ranges from 3.15 (slightly interesting) to 4.00 (interesting), texture analysis ranges from 2.50 (slightly

soft) to 3.84 (hard), foaming power analysis ranges from 3.00 (slightly foamy) to 3.50 (foamy).

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