

CHAPTER I

INTRODUCTION

1.1 Research Background

The development of the times had made technology more sophisticated to produce new things, for example such as dyes. Synthetic dyes are made to make dyes that are better than natural dyes. Synthetic dyes are made to make dyes that are better than natural dyes. Synthetic dyes have advantages including being easy to obtain, durable, and have a wider variety of colors. However, to make synthetic dyes superior to natural dyes, some synthetic dyes use harmful substances that have a worse impact than natural dyes¹. Synthetic dyes have impacts on health and the environment. In food and beverages, some synthetic dyes can cause cancer, or damage to the kidneys and liver. Synthetic dye waste is also harmful to the environment. Synthetic dye waste can degrade and will produce compounds that are toxic, thus impacting the body and the environment.²

Indonesia has a tropical climate, so many plants can be used as natural dyes, including lerak fruit. Lerak fruit has many active compounds, such as alkaloids, anthracins, phenols, flavonoids, steroids, triterpenes, essential oils, saponins and tannins³. Tannins are active substances derived from the polyphenol group that are polar, soluble in alcohol, glycerol and hydroalcoholic, water and acetone. Tannins have content that cannot be dissolved in chloroform, petroleum ether and benzene. The tannin content can be used as a natural dye because it has pigments that can produce brown color so that it can be used as a natural dye in soap.

¹ Ani Florida Ngete and Rara Intan Mutiara F, "Penggunaan Pewarna Alami Sebagai Upaya Meningkatkan Kualitas Kesehatan," *Jurnal Kesehatan Tujuh Belas (Jurkes TB)* 1, no. 2 (2020), <https://ojs.stikestujuhbelas.ac.id/index.php/jurkestb/article/view/25>.

² Titiek Pujilestari, "Review: Sumber dan Pemanfaatan Zat Warna Alam untuk Keperluan Industri," *Dinamika Kerajinan dan Batik: Majalah Ilmiah* 32, no. 2 (June 17, 2016): 93, <https://doi.org/10.22322/dkb.v32i2.1365>.

³ Dina Christin Ayuning Putri, Ni Putu Aryaswari Putri, and Margaretta Berlinda Listyawati, "The Potential Development Of Lerak (Sapindus Rarak) As A Useful Ingredient In The Pharmaceutical Field: POTENSI PENGEMBANGAN LERAK (Sapindus Rarak) SEBAGAI BAHAN BERMANFAAT DI BIDANG FARMASI," *Jurnal Farmasi Galenika* 10, no. 2 (2023): 124–33.

The community has long used Lerak fruit as a natural cleanser and natural coloring⁴. In Natasha Ardinata's research (2023), lerak fruit can be used as a natural dye to give the soap a brown color. The content in lerak has a tannin compound that can give a brown color to soap preparations.⁵

Soap is a cosmetic used to clean dirt on the body. Soap has two forms, solid and liquid, which can be used according to skin type. Among the two forms, solid soap has the advantage of containing canola oil which is good for eczema skin and causes a low level of pollution in the environment.⁶. Soap is a cosmetic used to clean dirt on the body. Soap has two forms, solid and liquid, which can be used according to skin type. . Among the two forms, solid soap has the advantage of containing canola oil which is good for eczema skin and has a low level of pollutionin in the environment.

Hygiene is very important in daily life, especially for hygiene before worship. A person's cleanliness affects his worship, therefore according to islam maintaining body hygiene is very important. As explained in the holy of the Qur'an Surah Al-Maidah verse 6:

يَا أَيُّهَا الَّذِينَ ءَامَنُوا إِذَا قُمْتُمْ إِلَى الصَّلَاةِ فَاغْسِلُوا وُجُوهَكُمْ وَأَيْدِيَكُمْ إِلَى الْمَرَافِقِ وَامْسَحُوا بِرُءُوسِكُمْ وَأَرْجُلَكُمْ إِلَى الْكَعْبَيْنِ ۚ وَإِنْ كُنْتُمْ جُنُبًا فَاطَّهَّرُوا ۚ وَإِنْ كُنْتُمْ مَرْضَىٰ أَوْ عَلَىٰ سَفَرٍ أَوْ جَاءَ أَحَدٌ مِنْكُم مِّنَ الْغَائِطِ أَوْ لَمَسْتُمُ النِّسَاءَ فَلَمْ تَجِدُوا مَاءً فَتَيَمَّمُوا صَعِيدًا طَيِّبًا فَامْسَحُوا بِوُجُوْهِكُمْ وَأَيْدِيكُمْ مِنْهُ ۚ مَا يُرِيدُ اللَّهُ لِيَجْعَلَ عَلَيْكُمْ مِنْ حَرَجٍ وَلَٰكِنْ يُرِيدُ لِيُطَهِّرَكُمْ وَلِيُتِمَّ نِعْمَتَهُ عَلَيْكُمْ لَعَلَّكُمْ تَشْكُرُونَ ٦

“O you who have believed, when you rise to (perform) prayer, wash your faces and your forearms to the elbows and wipe over your heads and wash your feet to the ankles. And if you are in a state of janabah, then purify yourselves. But if you are ill or on a journey or one of you comes from the palace of relieving himself or you have contacted women and do not find water, then seek clean earth and wipe over your faces and hands with it. Allah does not intend to make difficulty for you,

⁴ Ahmad Ainurofiq et al., “Pemanfaatan Sumber Daya Alam Lokal Dalam Peningkatan Produktivitas Industri Rumah Tangga Di Ingasrejo, Gondangrejo, Kabupaten Karanganyar,” *Jurnal Pengabdian Masyarakat Bangsa* 2, no. 8 (2024): 3622–30.

⁵ Agustina, Nur Ariyani and Piska, Finna, 2023, Karakteristik Fisik Sabun Organik Berbasis Minyak Jelantah Dan Ekstrak Buah Pinang Dengan Biosurfaktan Buah Lerak, *Agroprimatech* Vol.7 No.1

⁶ Nina Arlofa et al., “Pembuatan Sabun Mandi Padat Dari Minyak Jelantah,” *Jurnal Chemtech* 7, no. 1 (2021): 17–21.

but He intends to purify you and complete His favor upon you that you may be grateful”.

From the verse it can be explained that before worshiping it is better to clean yourself first from small and large hadas. To maintain cleanliness in religion has many kinds, namely by doing ablution, bathing, and cleaning the pubic area which is commonly called *istinja'*. Doing the cleaning can use water, but as technology develops soap can also be used for cleaning. Therefore, soap is made with a good formulation so that it can clean and also maintain the skin.⁷

Soap not only has a function as a cleanser but also can protect and care for the skin if it contains useful active ingredients. Yoghurt *whey* has content that can be used as an active substance in soap. Yoghurt *whey* is a combination of fresh cow's milk with *whey* which is fed with stater and fermented. The difference between *whey* yoghurt and regular yoghurt is in the ingredients it is made from. *Whey* is a waste from cheese making that contains antioxidants, vitamins A, vitamins B complex, vitamins E and many other ingredients.⁸

1.1 Research Problem

The Research problem in this research are:

1. What are the results of physical quality evaluation on solid yogurt whey soap with natural lerak fruit coloring in terms of organoleptic test and foam height test?
2. What are the results of the physical quality evaluation on whey yoghurt solid soap with lerak fruit natural coloring in terms of pH test, water content test, total fat test, ethanol insoluble material test, free alkali test, and chloride content test?

1.2 Research Objective

The research objectives of this study are:

⁷ Ria Puspitasari, “Pola Hidup Sehat Menurut Al-Qur’an:(Kajian Maudhu’i Terhadap Ayat-ayat Kesehatan),” *INOVATIF: Jurnal Penelitian Pendidikan, Agama, dan Kebudayaan* 8, no. 1 (February 7, 2022): 133–63, <https://doi.org/10.55148/inovatif.v8i1.268>.

⁸ Yola Desnera Putri, Ledianasari Ledianasari, and Giani Nurrahmawati, “Formulasi Dan Evaluasi Sabun Padat Dengan Penambahan Yoghurt Sebagai Antioksidan,” *Pharmaceutical Science Journal* 3, no. 1 (2023): 75–84.

1. To determine the results of physical quality evaluation on solid yogurt whey soap with natural lerak fruit coloring in terms of organoleptic test and foam height test.
2. To determine the results of physical quality evaluation on whey yoghurt solid soap with lerak fruit natural coloring in terms of pH test, water content test, total fat test, ethanol insoluble material test, free alkali test and chloride content test based on SNI standards.

1.4 Research Benefits

1. Theoretical Benefits

The results of this study can be used as reference material for further research on the effect of lerak fruit natural coloring on yoghurt solid soap.

2. Practical Benefits

The results of this study are expected to add to the repertoire of science and add insight to readers, especially soap users.

1.5 Authenticity Research

Research on solid yogurt *whey* soap preparations has been conducted by several researchers as shown in table 1 below.

Table 1. Originality of Research

Research Title	Research Method	Variable	Results	Research Differences
Antimicrobial Activity of Natural Solid Soap with a Combination of Liquid Cheese Waste, Turmeric	Laboratory experimental	Dependents: Antimicrobial Activity of Natural Solid Soap Independent: Combination of Cheese Liquid Waste,	Solid soap formulation with 100% yoghurt <i>whey</i> variant and added curcumin proved to be the best formula because it has good physicochemical properties and better antibacterial activity	Dependents: Formulasi Sabun Padat Yoghurt Whey Independent: Dengan Ekstrak Buah Lerak Sebagai

(<i>Curcuma longa</i>) and Dragon Fruit Peel ⁹	Turmeric (<i>Curcuma longa</i>), and Dragon Fruit Peel (<i>Hylocereus polyrhizus</i>)	compared to other formulas. Soap with yoghurt <i>whey</i> without addition and with the addition of dragon fruit skin and tumeric can potentially be used as an antimicrobial.	Pewarna Alami
Skrining Fitokimia Dan Analisis Kromatografi Lapis Tipis Dari Ekstrak Etanol Buah Lerak (<i>Sapindus rarak</i>) ¹⁰	Laboratory experimental	Dependents: Phytochemical Screening and Thin Layer Chromatography Analysis Independent: From Ethanol of Lerak Fruit (<i>Sapindus rarak DC</i>)	Dependents: Solid Soap Formulation Independent: With Lerak Fruit (<i>Sapindus rarak DC</i>) Natural Colorant

⁹ Solikah Ana Estikomah et al., "Antimicrobial Activity of Natural Solid Soap with a Combination of Liquid Cheese Waste, Turmeric (*Curcuma Longa*), and Dragon Fruit (*Hylocereus Polyrhizus*) Peel," *Molekul* 18, no. 3 (November 20, 2023): 434, <https://doi.org/10.20884/1.jm.2023.18.3.8039>.

¹⁰ Inarah Fajriaty, "Skrining Fitokimia Dan Analisis Kromatografi Lapis Tipis Dari Ekstrak Etanol Buah Lerak (*Sapindus rarak*)," no. 2 (2017).

		contains tannin compounds.		
The Utilization of Whey Cheese Fermented with Kefir Grains as An Antibacterial Solid Bar Soap ¹¹	Laboratory experimental	Dependents: Utilization of <i>whey</i> cheese fermented with kefir seeds Independents : Antibacterial solid soap bar	The results showed that all <i>whey</i> kefir solid soap formulations showed good physicochemical properties with pH ranging from 10.22 to 11.55 (meeting ASTM 9-11 requirements), moisture content between 5.9% to 11% (below SNI requirements of 15%) and free alkali in the range of 0.0055% to 0.042% (far below the maximum SNI of 2.5%). This shows that all formulations have met the standards of SNI 3532: and ASTM-D 2002. The most effective formulation was 100% <i>whey</i> .	Dependents: Yogurt <i>whey</i> Solid Soap Formulation Independen: With Lerak Fruit Extract as Natural Colorant

¹¹ Solikah Ana Estikomah et al., "The Utilization of Whey Cheese Fermented with Kefir Grains as An Antibacterial Solid Bar Soap," 2024.

Formulation of Hand Soap Preparations from Lerak Fruit (Sapindus rarak DC) With Variations of Na-CMC ¹²	Laboratory experimental	Dependents: Formulation of Hand Soap from Lerak Fruit Independent: With Variations of Na-CMC	The results obtained for lerak fruit hand soap preparations are qualified with pH ranging from 8.06-8.39 and viscosity ranging from 522.47 cps-679.95 cps. Evaluation of foam height in F3 did not meet the requirements (10 mm), in F1 (14 mm) and F2 (13 mm) met the requirements. Hedonic test panelists chose F2 based on color, fragrance and texture. Based on the physical and hedonic properties test on lerak fruit hand soap, the best formula is F2 with 4% Na-CMC concentration.	Dependents: Yoghurt Solid Soap Formulation Independent: With Lerak Fruit extract as Natural Colorant
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¹² Rose Intan Perma Sari, "Formulasi Sediaan Hand Soap Dari Buah Lerak (Sapindus rarak DC) Dengan Variasi Na-Cmc," Jurnal Ilmiah Pharmacy 10, no. 2 (October 27, 2023): 99–106, <https://doi.org/10.52161/jiphar.v10i2.499>.