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Utilization of Patchouly Oil as Facial Wash Cosmetic For Acne-Prone Skin

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Abstract

The research on utilizing patchouli oil as a facial wash for acne-prone skin employs a quantitative approach with an experimental design. Acne issues occur in both females and males aged 17-21. Acne skin care can be addressed using natural-based facial cleansers containing antibacterial ingredients. One natural ingredient that can be used for facial wash is Patchouli leaves, which contain active compounds such as alkaloids, saponins, phenolics, flavonoids, triterpenoids, and glycosides that act as antibacterial agents. The facial wash formulation was designed by varying the concentration of patchouli oil: F1 (1%), F2 (2%), and F3 (3%). Phytochemical screening of the patchouli oil facial wash revealed that F1, F2, and F3 were negative for flavonoids, positive for saponins, and F1 was negative for alkaloids while F2 and F3 were positive. The results showed that the patchouli oil facial wash met the requirements for organoleptic tests, pH tests, homogeneity tests, and foam height tests. Among the various formulations, F3 was found to meet the requirements most effectively.

Keywords : *Acne, Facial Wash, Patchouli Leaves*

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1. Introduction

The face is one of the parts of the human body with varying characteristics, especially the facial skin (Fransisca et al., 2021). Acne is a common skin issue among teenagers, both male and female. The cause of inflamed acne can be triggered by the presence of Staphylococcus epidermidis, Staphylococcus aureus, and Propionibacterium acnes, which are normal flora (Saraswati, 2015). Acne usually appears during adolescence, around the ages of 12-15, with the severity often increasing in adulthood, particularly between the ages of 17-21 (Putri & Minerva, 2022).

The diversity of skin types, such as dry, oily, combination, or sensitive, presents its own challenges in care and maintenance. Additionally, facial skin color and condition can vary significantly between individuals, influenced by genetic, health, and environmental factors. Discoloration, such as redness or hyperpigmentation, as well as skin problems such as acne and wrinkles, are part of the complexity of facial skin that requires special attention to maintaining its health.According to (Minerva, 2019) acne can have negative psychological effects, influencing how someone perceives the condition and situation of a person with acne. According to (Melian, 2018 acne treatment can be carried out using facial cleansers containing anti-acne ingredients. Therefore, it is essential to formulate antibacterial natural ingredients into facial wash preparations. Facial wash is a mild and gentle facial cleanser that helps maintain skin cleanliness, providing a practical and cost-effective anti-acne alternative (Harefa & br Tarigan, 2020).

(Styawan & Linda, 2016) explain that natural ingredient formulas in facial wash cosmetics can enhance comfort in usage, as they may reduce concerns about long-term side effects. One natural ingredient that can be used for facial wash is patchouli leaves (patchouly oil). Research by (Karimi, 2014) states that patchouli oil contains active compounds such as alkaloids, saponins, phenolics, flavonoids, triterpenoids, and glycosides, which are secondary

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metabolites that can be used as antibacterials.The utilization of patchouly oil as an ingredient in facial wash products offers additional potential benefits in the treatment of acne-prone skin. With its ability to calm inflammation, reduce redness, and fight acne-causing bacteria, patchouly oil can be an effective natural alternative for skin care. Research on the effectiveness of patchouly oil in cosmetic face wash formulations has not been conducted, so it is important to explore the potential benefits and safety of its use.

One plant that can be utilized as an anti-acne treatment is the patchouli plant (Pogostemon cablin Benth), a fragrant shrub with soft leaves and square stems. The main component in patchouli oil is patchouli alcohol, which functions as an anti-inflammatory, antibacterial, anti-inflammatory, and decongestant. Patchouli oil is an essential oil obtained through steam distillation or extraction of patchouli plants, usually fresh leaves. As an export commodity, patchouli oil has good prospects due to its continuous demand in the cosmetics, pharmaceutical, perfume, and toothpaste industries, among others (Dongare et al., 2014; Swamy & Sinniah, 2015).

Patchouli oil, which is obtained through steam distillation from fresh leaves, contains the main component in the form of patchouli alcohol. These compounds have a variety of properties, including anti-inflammatory, antibacterial, and antioxidant effects, which help reduce inflammation, kill acne-causing bacteria, and fight free radicals. In addition, the decongestant properties of patchouli oil help open clogged pores, preventing acne from occurring. Patchouli oil also has good prospects as an export commodity, due to the stable demand in the cosmetics, pharmaceutical, perfume, and toothpaste industries, making it one of the high-value natural ingredients and constantly sought after in the global market.Patchouli oil is obtained through steam distillation or extraction from the fresh leaves of the patchouli plant. The main component in patchouli oil is patchouli alcohol, a compound that gives this oil its therapeutic properties. Patchouli alcohol acts as an anti-inflammatory, helping to reduce inflammation and redness on acne-prone skin. In addition, patchouli oil also has antibacterial properties that are effective against acne-causing bacteria. The other anti-inflammatory properties of this oil help soothe inflamed skin, while its decongestant properties can reduce the swelling and redness that often accompany acne.

Patchouli alcohol, which is the main compound in patchouli oil (Pogostemon cablin), plays an important role in the treatment of acne thanks to its ability to reduce inflammation, fight bacteria, and reduce swelling. The anti-inflammatory properties of patchouli alcohol help reduce inflammation in acne-prone skin. Acne often causes redness and swelling around the affected area, which is caused by the body's inflammatory response to bacteria or clogged pores. Patchouli alcohol works by reducing this inflammation, reducing redness and making the skin feel more comfortable. By reducing the inflammatory response, patchouli alcohol also speeds up the acne healing process, so the skin can return to normal faster. Patchouli alcohol has antibacterial properties that are effective against acne-causing bacteria, such as Propionibacterium acnes. These bacteria can aggravate acne by causing infection in the hair follicles and worsening inflammation. By reducing the number of these bacteria, patchouli alcohol helps to reduce the risk of infection and prevent new acne from forming, providing a cleansing effect on the skin and helping to maintain its cleanliness. The decongestant properties of patchouli alcohol serve to reduce swelling that often occurs around acne. Acne can cause fluid accumulation in the skin tissue that makes it appear swollen. Patchouli alcohol helps reduce this swelling by addressing fluid accumulation and opening up clogged pores, which are the main cause of acne. By opening pores, patchouli alcohol facilitates the removal of excess sebum and impurities from the skin, reducing the likelihood of new acne occurring and improving the overall appearance of the skin. Overall, patchouli alcohol provides comprehensive benefits for acne-prone skin through a combination of anti-inflammatory, antibacterial, and decongestant properties. It helps reduce acne symptoms, speed up healing, and keep the skin clean and healthy.Based on the above, the researcher is interested in conducting research on patchouli oil. This study refers to the research by (Komala et al., 2020) which discusses the feasibility of facial wash preparations from beluntas leaf extract, assessed

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through laboratory tests (flavonoids, pH test, and foam height test), organoleptic tests (texture, aroma, and color), and hedonic tests (panelist preferences).

2. Method

This study used a quantitative method with an experimental research design. The data sources in this research were observations using a checklist observation sheet, documentation, and questionnaires also in the form of checklists.

Patchouli Oil Distillation Method

In this study, the researcher used the patchouli oil distillation method with water distillation. In this method, the material to be distilled is directly contacted with boiling water. The material either floats on the water or is completely submerged, depending on the weight and quantity of the material being distilled. The water is heated using a conventional heating method, which is typically done with direct heat (Zainuddin Ginting & Dewi, 2022). The working principle of water distillation is that the distillation kettle is filled with water until it is nearly half full, and then it is heated. Before the water boils, the raw material is placed into the distillation kettle. Thus, the evaporation of water and essential oil occurs simultaneously. This type of distillation is called direct distillation. The raw materials used are usually flowers or leaves that can easily move in water and are not easily damaged by steam heat..

Patchouli Oil Facial Wash Formulation

Table 1. Patchouli Oil Facial Wash Formulation

Ingredient	Formulation (%)		
	F1	F2	F3
Patchouli Oil	1	2	3
Stearic Acid	2.50	2.50	2.50
Sodium Lauryl Sulfat	19.50	24.40	29.30
NaCl	1.67	1.67	1.67
Gliserin	0.50	0.60	0.70
Adeps Lanae	0.50	0.50	0.50
Metilparaben	0.10	0.10	0.10
Trietanolamin	0.15	0.15	0.15
Aquadest	100ml	100ml	100ml

Source: Data Processing

Phytochemical Screening Test

The patchouli oil facial wash extract sample was tested in the laboratory to determine the flavonoid, saponin, and alkaloid content in the patchouli oil facial wash. To analyze flavonoid content, Mg powder and HCl (p) were added. To analyze saponin content, distilled water was added and shaken for 30 seconds to form foam. To analyze alkaloid content, the sample was added with a few drops of chloroform ammonia reagent, sulfuric acid (2N), and Mayer's reagent.

pH Test

The pH of the patchouli oil facial wash was tested using a universal pH meter to determine the pH level of the patchouli oil facial wash. The required pH range for skin is 4.5 – 6.5 (Safilla et al., 2022).

Homogeneity Test

The homogeneity test was conducted by applying the facial wash sample onto a glass slide or other suitable transparent material, and homogeneity was observed under a microscope at 100x magnification to determine the homogeneity level of the patchouli oil facial

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wash. The homogeneity requirement is that it should not contain coarse particles that can be felt (Yanti, 2019).

Foam Height Test

The patchouli leaf oil facial wash preparation was placed in a measuring cylinder and shaken for 20 seconds by inverting the measuring cylinder. The foam height and texture were observed at the 15-minute mark (Faizatun et al., 2008)

Organoleptic and Hedonic Tests

The organoleptic test was conducted to assess the quality of the facial wash through its texture, aroma, adhesion, and the level of panelist preference.

3. Results and Discussion

The patchouli oil extract facial wash samples were tested in the laboratory to determine the content of flavonoids, saponins, and alkaloids in the patchouli oil facial wash. The results obtained from these laboratory tests are as follows:

Table 2. Phytochemical Screening Test Results

No	Type of Test	Result			Reagent	Documentation
		F1	F2	F3		
1	Flavonoid	-	-	-	Mg dan HCl	
2	Saponin	+	+	+	Aquadest	
3	Alkoloid	-	+	+	Chlorof orm,am oniak, asam sulfat (2N), reagen mayer	

Source: Data Research

Based on the table above, it can be explained that F1, F2, and F3 samples of the flavonoid fraction turned white after the addition of Mg powder and HCl(p), indicating that F1, F2, and F3 were negative for flavonoid content. F1, F2, and F3 samples of the saponin fraction formed stable foam after adding distilled water and shaking for 30 seconds, indicating that F1, F2, and F3 were positive for saponin content. F1, F2, and F3 samples of the alkaloid fraction, after being added with a few drops of chloroform ammonia reagent, sulfuric acid (2N), and Mayer's reagent, showed that F1 was negative for alkaloid content while F2 and F3 were positive for alkaloid content.

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pH Test

The pH test results showed that the patchouli oil facial wash met the pH requirements for the skin. Formulation F1 had the highest pH of 6.5 compared to F2 and F3, which both had a pH of 5.5. The pH measurement aims to determine whether the resulting preparation is acceptable for skin pH or not, as this is related to the safety and comfort of the product when used.

Table 3. pH Values

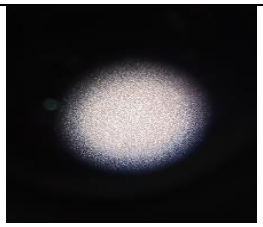
No	Formulation	Skin pH Range	pH	Image
1	F1	4,5 – 6,5	6,5	
2	F2	4,5 – 6,5	5,5	
3	F3	4,5 – 6,5	5,5	

Source: Data Research

Homogeneity Test

The homogeneity test was conducted by applying the facial wash sample onto a glass slide or other suitable transparent material, and the homogeneity was observed under a microscope at 100x magnification to determine the homogeneity level of the patchouli oil facial wash. Formulations F1, F2, and F3 were homogeneous.

Table 4. Homogeneity Test

No	Formulation	Result	Documentation
1	F1	Homogen	
2	F2	Homogen	
3	F3	Homogen	

Source: Data Research

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Foam Height Test

The foam height test was conducted to observe the foamability of the liquid soap made according to the foam height standards set by the Indonesian National Standard (SNI), which is 13-220 mm. Formulation 1 with a 1 g oil concentration had a foam height of 6 cm, formulation 2 with a 2 g oil concentration had a foam height of 7 cm, and formulation 3 with a 3 g extract concentration had a foam height of 8 cm. The higher the concentration, the more foam is produced, which comes from the saponin compounds present in the patchouli oil.

Table 5. Foam Height Test

No	Formulation	Result	Documentation
1	F1	6 cm	
2	F2	7cm	
3	F#	8 cm	

Source: Data Research

Organoleptic and Hedonic Tests

The best organoleptic texture test result was found in formulation F3, which was very thick. The best organoleptic aroma test result was found in formulation F3, which was very aromatic. The best organoleptic color test result was found in formulation F3, which was very bright in color, and the best hedonic test result was found in formulation F2, which was highly preferred.

4. Conclusion

The suitability of the patchouli oil facial wash was assessed through laboratory tests (phytochemical screening, pH test, foam height test, and homogeneity). Phytochemical screening revealed that F1, F2, and F3 were negative for flavonoid content. F1, F2, and F3 were positive for saponin content. F1 was negative for alkaloid content, while F2 and F3 were positive for alkaloid content. The pH test results for formulations F1, F2, and F3 showed a normal skin pH range of 4.5-6.5. The homogeneity test results showed that all formulations were homogeneous. The foam height test results showed that all formulations met the foam height standards. The suitability of the patchouli oil facial wash was also assessed through organoleptic tests (texture, aroma, and color). The best organoleptic texture test result was found in formulation F3, which was very thick. The best organoleptic aroma test result was found in formulation F3, which was very aromatic. The best organoleptic color test result was found in formulation F3, which was very bright in color, and the best hedonic test result was found in formulation F2, which was highly preferred. It can be concluded that all laboratory tests, organoleptic tests, and hedonic tests favored formulation F3.

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