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HERBAL SHAMPOO INNOVATION: PURWACENG EXTRACT AS THE MAIN ACTIVE INGREDIENT

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ABSTRACT

Shampoo is a hair care product commonly used by the general public with the main ingredient being surfactant/detergent (Pravitasari et al., 2021). Some people experience hair health issues such as dandruff and hair loss caused by hormonal changes in the body, dirty hair, and infrequent shampooing, or the use of inappropriate shampoo products. This article aims to present an innovation in shampoo using Purwaceng extract. Purwaceng (Pimpinella pruatjan) is an indigenous Indonesian herbal rich in properties, found in the highlands of Dieng, Central Java. Purwaceng contains active antioxidant compounds including flavonoids, alkaloids, saponins, and tannins (Andrian, 2021). These compounds make Purwaceng potentially effective in preventing dandruff, stimulating hair growth, maintaining scalp health, and addressing hair loss. The research method involves formulation to determine the optimal composition and formula, using three sample preparations (F0, F1, and F2) that undergo stability testing. The conclusion is that the shampoo with the appropriate formula exhibits good stability for hair and is safe, as demonstrated by Sample F1. The results of this study are expected to provide information on the stability and safety of Purwaceng extract as a shampoo raw material. Additionally, it is hoped that the public can utilize Purwaceng to develop innovative shampoo products with further potential for development.

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1. INTRODUCTION

Hair is an addition to the scalp that provides warmth, protection, and beauty (Nurhikma et al., 2018:1). However, most people have hair health problems such as dandruff and hair loss. This is a common problem experienced by many people. This is due to hormonal changes in the body, unhealthy lifestyles, dirty hair and rarely shampooed, or the use of inappropriate shampoo products. Shampoo products with various formulations are currently sold freely, some even without laboratory testing. However, people who do not understand the safety of the chemical content of shampoos still buy them even though they end up giving bad side effects in long-term use. To overcome current hair problems, there are already many shampoo products that use herbal ingredients which are safer and have lower side effects when compared to chemicals.

Figure 1. Purwaceng Herbal Plant

Purwaceng or purwoceng is better known as a typical plant of the Dieng Plateau, Central Java. Other places reported that purwaceng can grow are the Hyang Mountains (also known as suripandak abang) and the Tengger Mountains (known as gebangan dhepok). Almost all parts of the purwaceng plant can be used. However, the most commonly used part of the plant with the scientific name Pimpinella pruatjan is the root. The physical appearance of purwaceng is a small herb that grows horizontally on the surface of the ground like pegagan and mountain clover but does not creep. The leaves are small, reddish green in color with a diameter of 5-30 cm.

Purwaceng is a herbal plant that has great potential if developed further. Purwaceng contains antioxidants such as flavonoids, alkaloids, saponins, and tenins. This content makes purwaceng can be used as a raw material for shampoo to prevent dandruff, stimulate hair growth, maintain scalp health, and overcome hair loss. However, research on the use of purwaceng as a raw material for shampoo is relatively new and is still a fresh topic of research, this is precisely what is used as the main goal and focus of developing new innovations with formulation methods and stability tests on shampoo sample preparations with the main active ingredient of purwaceng extract to determine the composition of the optimal and safe shampoo formula to use, so that this beginning is expected to be continued research with a longer time to produce more accurate data, then developed into a unique and attractive hair care product for development and can be traded generally by the local community to all consumers both within and outside the region.

2. METHODS

Tools and materials

1. Purwaceng extract:
   a. Tools: 250ml Distillation Flask, Heater, Condenser, Container (erlenmeyer), Clamp and stand (connector), tripod and gauze, connector (adapter) and hose, stirring spoon, thermometer, funnel (glass funnel), scales, 200 ml breaker, dark glass bottle for sample storage. (Kautsar Ul Haq. 2021).
   b. Ingredients: solvent (96% ethanol) and purwaceng powder.
2. Making shampoo samples:
   a. Tools: Scales, 25 ml breaker, Hot Plate Magnetic Stirrer, 3 ml pipette, measuring spoon, sample tube.
3. Sample stability test

a. Ingredients: SLES, glycerin, phantenol, aquadest, Lexgard (preservative), fragrance (optional) and purwaceng extract.
b. Tools: microscope, preparation, pH meter, buffer 6.86 and 4.01, breaker, petri dish, 1 ml pipette, stirring spoon. Material: citron AC ID

4. Laboratory Safety Equipment and Mobile Phone Camera for documentation

Research Procedures

1. Steps for making Purwaceng Extract Distillation Method: Prepare individual safety in the Laboratory, prepare a simple distillation apparatus for extraction, also install a thermometer to monitor the temperature, and also prepare purwaceng powder and 96% ethanol. Put 70 gr of purwaceng powder (estimated) into the distillation flask and add 700 ml of ethanol with a ratio of 1:10 to dissolve the active components of the powder, wait for about 120 minutes. Heat to a boiling point of 78.3˚C, monitor the temperature (if it exceeds it, the maximum is 81˚C. Allow the boiled material to evaporate towards the condenser tube and the steam is cooled using cooling water through the condenser. Then collect the distillate results in the form of liquid extract collected in the container and store in a dark glass bottle to avoid oxidation, then the extract is used as one of the ingredients for making shampoo. (Aptika Dewi. 2021).

Figure 2. Extraction Process

2. Steps for making Purwaceng Extract Shampoo: Each ingredient is weighed first according to the specified formulation. Prepare the breaker then dissolve SLES using distilled water and heat on a Hot Plate at a temperature of 7 0 ˚C, stir with a magnetic stirrer. Add Glycerin, Lexgard, Phantenol to the SLES solution and add distilled water again until you get the desired consistency. Add purwaceng extract and perfume (optional) wait for 30 minutes until the ingredients are mixed and homogeneous, do the same with the three formulas. Then let the mixture cool to room temperature . Store the samples overnight with different temperature treatments for each sample . F0: 5˚C or lower, F1: 25˚C stable temperature, F2: 40˚C or higher.

Table 1. Shampoo Formula

Material	F0	F1	F2	Function
Purwaceng Extract	0 ml	1 ml	2 ml	Active Ingredients
Sodium Laureth Sulfate (SLES)	1 ml	1 ml	1.5 ml	Foamer and Cleaner
Glycerin	1 ml	1 ml	1.5 ml	Moisturizer (humectant)
Lexgard	0.5 ml	0.5 ml	1 ml	Preservative
Phantenol	0.5 ml	0.5 ml	1 ml	Moisture Lock

Aquadest	6 ml (Ad)	6 ml (Ad)	6 ml (Ad)	Solvent regulator	and PH

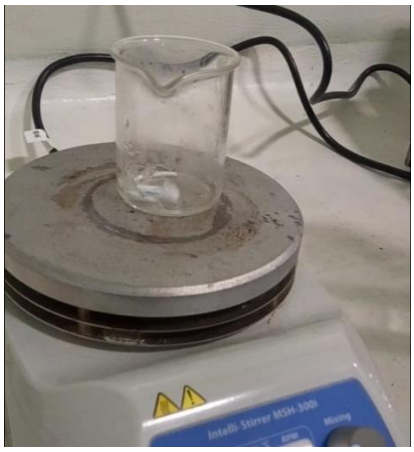

Figure 3. Shampoo Sample Making Process

3. Physical Evaluation of Preparations: by conducting stability tests

Organoleptic Test

Testing using the Five Senses by observing the shape, color, and smell of 3 sample results that have been made with the criteria that the results do not change after being stored overnight.

Homogeneity Test

Prepare the microscope and the preparation, the sample is smeared thinly on a clean object glass and placed on the preparation table, use a macrometer to bring the preparation table close to the objective lens (do not touch), then focus with a micrometer then observe through the eyepiece lens with a magnification of 100x or adjusted. So that the expected result is a homogeneous sample and a flat texture or no clumping of coarse grains

PH Test

It is done by measuring the results of the preparation using a PH meter with criteria between 4.0 - 6.5. Steps to use the PH meter, open and close the ON switch, dip it in a 6.86 buffer solution (200cc), press cal for 5 seconds and release, the screen flashes showing the number 6.86, wait until the End text appears, the screen will turn off for a moment, then wash and dry, repeat with a 4.01 buffer solution . If the results No in accordance so add citric acid for balance the PH with how to add little by little .

Hedonic Test

By measuring the level of preference using random respondents. (Radani et all., 2022).

Figure 4. Organoleptic Test

Figure 5. Homogeneity Test

Figure 6. PH test

Explaining research chronological, including research design, research procedure, how to test and data acquisition. The method used should be accompanied by references; the relevant modification should be explained. The procedure and data analysis technique should be emphasized in a literature review article. The stages and analysis of the research must be explained in detail.

3. RESULTS AND DISCUSSION

Organoleptic test

Table 2. Organoleptic Test Results

Formula	Form		Smell		Color	
	Before	After	Before	After	Before	After
F0	Thick	Thin	Fragrant	Fragrant	Transparent	Semi Turbid
F1	Thick	Semi-liquid, lumpy	Fragrant	Fragrant	Transparent	Transparent
F2	Thick	Thick, lumpy	Fragrant	Fragrant	Transparent	Semi Turbid

Based on the results of table 2, it can be concluded that the three samples that have been stored overnight at different temperatures, namely low temperature: 5˚C, room temperature: 25˚C, and high temperature: 40˚C. show a form that has been diluted, semi-liquid (medium), thick, and lumpy. The smell shows that the three samples remain fragrant and without change. Then for the color has 2 results, namely transparent and semi-cloudy (medium).

Homogeneity test

Table 3. Homogeneity Test Results

Formula	Parameter
F0	Homogeneous
F1	Homogeneous
F2	Homogeneous

From the results of the homogeneity test using a microscope with adjusted magnification: 100 to 1000x, the results of all three were obtained: even texture, homogeneous, with foam granules that appear to be the same size

PH Test

Table 4. PH Test Results

Formula	Color	Aroma	Texture
F0	2	2	1
F1	5.5	4	7
F2	1.5	3	1

From the three samples showed that the PH was too alkaline for hair. Then added citric acid which is acidic as a stabilizer, the final result was obtained which was suitable for hair PH, which was between 4.0 - 6.5.

Hedonic Test

Table 4. Hasil Uji Hedorik

Formula	Color	Aroma	Texture
F0	2	2	1
F1	5.5	4	7
F2	1.5	3	1

It was found that respondents stated that of the three samples with hedonic test parameters including color, aroma, texture, they preferred F1 because of the fragrance, where the perfume mixture was more than the other samples. Respondents also tried rubbing the preparation on the skin of the arm and found that the color and texture were even and of course fragrant.

4. CONCLUSION

This study shows that purwaceng extract can be used as an active ingredient that has the potential to prevent dandruff, stimulate hair growth, maintain scalp health, and overcome hair loss, these benefits come from the contents: flavonoids, alkaloids, saponins, tenins. After the formulation and continued with the first stability test, namely the organoleptic test with the results of samples in the form of dilute, semi-liquid (medium), thick, and lumpy. The smell shows that the three samples remain fragrant and without change. Then for the color has 2 results, namely transparent and semi-cloudy (medium). The second homogeneity test with homogeneous and non-homogeneous results because there is a clumping of material. The third PH test shows a PH range between 4.0 - 6.5, this is in accordance with the PH of the hair. The fourth hedonic test with an average result of liking sample F1, this is because of its fragrant aroma, thick texture, and color that remains transparent.

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