

## COMBINATION OF COFFEE GROUNDS (*Coffea*) AND LIME PEEL EXTRACT (*Citrus aurantifolia*) IN MAKING BODY SCRUB

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### ABSTRACT

Coffee grounds and lime peel extract can be used as raw materials for making environmentally friendly Body Scrub. This research aims to determine the effect of coffee grounds and lime peel extract and the effect of their use on the finished Body Scrub. A combination of coffee grounds and lime peel extract is used in variations of 15 g, 20 g, 25 g, 30 g, 35 g, and 40 g, for coffee grounds, while for lime peel extract the variations are 2 g, 2.5 g, 3 g, 3.5 g, and 4 g. Tests carried out include organoleptic tests, pH tests, homogeneity tests, microbial contamination tests, irritation tests, and existing humidity tests on volunteers. The research results that the body scrub preparation met the evaluation of the physical preparation of the Body Scrub preparation, namely coffee aroma, brown color and semi-solid texture, pH ranged from 5.2-5.9, homogeneous, didn't irritate the skin, and could increase moisture in the skin.

**Keywords:** Coffee grounds (*Coffea*), Body Scrub, lime peel extract (*Citrus aurantifolias*), moisture, combination

## INTRODUCTION

Coffee grounds contain ingredients that are good for the skin, such as high levels of antioxidants, including flavonoids and polyphenols. The content of dicaffeoylquinic acid and chlorogenic acid in coffee beans can function as an antidote to free radicals. In its application, coffee grounds are widely used for various benefits, having the ability to remove dead skin cells, reduce cellulite, brighten dull skin, and minimize the risk of skin cancer. One way to use coffee grounds in the beauty sector is to make a body scrub [1].

The lime peel of an orange contains more than 60% flavonoids and 170 different types of phytonutrients. Both are great for the skin and body system. Lime peel is able to balance the condition of the skin, reduce excess oil on the skin so that the skin becomes softer and away from acne problems. In lime peel you can also find vitamin C which can absorb oil from the skin and remove dead skin cells so that the skin looks cleaner, softer and brighter [2,3].

Skin care is an action taken to maintain or restore something to a healthy and fresh skin condition. Skin care consists of two parts, namely internal care and external care. External skin care is care that is carried out directly on the skin to make it look clean, bright and healthy [4].

Body scrubs are a cosmetic product used for external skin care. Body scrubs have coarse grains that function to remove dead skin cells and clean the skin optimally, which is called an abrasive or sander. Body scrub products can be in the form of powder, gel or cream. Cream-shaped body scrub preparations can increase the effectiveness of using active ingredients on the skin, are easy to use on the skin, spread easily so consumers prefer to use cream-shaped body scrub preparations rather than other preparations.

In previous research conducted by [1] regarding "Formulation of Body Scrub Preparations from Coffee Grounds Combined with Olive Oil as a Skin Brightener and Moisturizer" from this research it was found that a better body scrub cream preparation containing 20% coffee grounds showed an improvement in skin condition for the better, including water content in improved skin (10.4%) so that the skin becomes more moisturized and brightness increases after use has conducted research on "Utilization of Lime Fruit Skin Waste (*Citrus aurantifolia*) and Moringa Leaves (*Moringa oleifera* Lamk) for Making Traditional Body Scrubs as an Alternative (GREEN COSMETICS)" From this research there is a real influence of the proportion of lime peel and Moringa leaves on the properties physical body scrub which includes aroma, color, texture, shape, adhesive power.

Body Scrub functions to remove rough and dull body skin. Scrubs also function to help speed up the replacement of new body skin cells, which are healthier and cleaner. Skin that was rough and dull will look bright and no longer

dull. The skin will feel smooth, soft, not easily dry, because the process of changing new skin will continue to occur and there will be no excessive buildup of dead skin cells. Body scrub is a cosmetic that is used to care for and clean the skin from dirt and dead skin cells. Body scrub is a pharmaceutical preparation in the form of a beauty product which functions to soften the body's skin and remove damaged skin cells with the help of scrub ingredients. Body scrub is an activity to remove dirt, oil or dead skin which is done by massaging the entire body. The results can be seen immediately,[3-5].

It is hoped that making this body scrub can provide information to the wider community regarding the use of coffee grounds waste (*Coffea*) and lime peel (*Citrus aurantifolia*) for skin health care as a moisturizer and skin brightener in body scrub preparations thereby providing quite high economic value to waste dregs. coffee (*Coffea*) and lime peel (*Citrus aurantifolia*), apart from that it can also reduce the impact of environmental pollution.

This research was also carried out to see the effect of variations in coffee grounds (*Coffea*) on the quality of body scrubs and to determine the effect of variations in lime peel extract (*Citrus aurantifolia*) on the quality of body scrubs.

## **METHOD**

### Research methodology

The tools used in this research were: blender, sieve, stirring rod, digital scale, chemical glass, measuring cup, hatching pipette, rotary evaporator, flannel cloth, pH meter, pestle mortar, filter paper, knife, horn spoon, stopwatch, skin analyzer.

The materials used in this research were: coffee grounds waste, lime peel, stearic acid, sorbitol, triethanolamine, propylene glycol, cetyl alcohol, metal paraben, collagen, alpha arbutin, fixative, 96% ethanol, perfume, distilled water.

The steps are as follows:

#### 1. Raw Material Preparation

The coffee grounds waste used was obtained from Arabica coffee sellers in the Simpang Rangkaya area, North Aceh. Meanwhile, the lime peel used was obtained from random collection of lime peels without paying attention to size and color.

#### 2. Simplicia Making Process

Weigh 500 grams of lime peel. Wash the lime peel, then drain it. Dry the lime peel for 3 days. Once dry, the lime peel is cut into smaller pieces to make the drying and grinding process easier. Then the lime peel is mashed using a blender. Then a sample of 2-5 grams is taken to calculate the water content. Lime peel powder was sieved using a 60 mesh sieve.

#### 3. Making Lime Peel Extract

The lime peel extract used is that which passes through a 60 mesh sieve. Then

put 150 grams of simplicia powder into 3 glass containers. Add 2 liters of 96% ethanol into each glass container until the sample is submerged. Macerated for 5 days protected from light, stir occasionally. The sample is filtered and the filtrate obtained is collected. The filtrate obtained was evaporated using a rotary evaporator at a temperature of 40°C until a thick extract was obtained.

#### 4. Coffee Grounds Waste Preparation Process

Weighed 750 grams of coffee grounds waste. Strain the coffee grounds using a cloth to separate the water. Dry the coffee grounds in the sun for 3 days. After drying, a sample of 2-5 grams of coffee grounds waste is taken to calculate the water content. The coffee grounds waste powder was sieved using a 40 mesh sieve.

#### 5. Body Scrub Making Process

Prepare tools and materials and weigh each material needed. Heat the mortar and pestle with hot water then wipe dry. Mix the oil phase ingredients (stearic acid, cetyl alcohol) into a beaker and melt on a hot plate at a temperature of 70°C (mass I). Dissolve the water phase (sorbitol, propylene glycol, triethanolamine, methylparaben) in distilled water at a temperature of 70°C (mass II). Put mass I into a hot mortar that has been dried. Slowly add mass II and grind constantly until a homogeneous cream mass is obtained. Then add coffee grounds waste and lime peel extract to the base of the scrub cream (according to research variables), grind again and add 10 drops of perfume and 7 drops of homogenized fixative. Evaluate the scrub cream preparation.

### **Trial Treatment**

#### 1) Fixed Variable

- Stearic Acid : 12 grams
- Sorbitol : 5 grams
- Triethanolamine: 1 gram
- Propylene glycol : 3 grams
- Cetyl Alcohol : 0.5 grams
- Methyl Paraben : 0.2 grams
- Collagen: 1 gram
- Alpha arbutin : 1 gram
- Fixative : 7 drops
- Ethanol 96% : 2 liters
- Perfume : 10 drops
- Aquadest : 80 ml

#### 2) Independent Variable

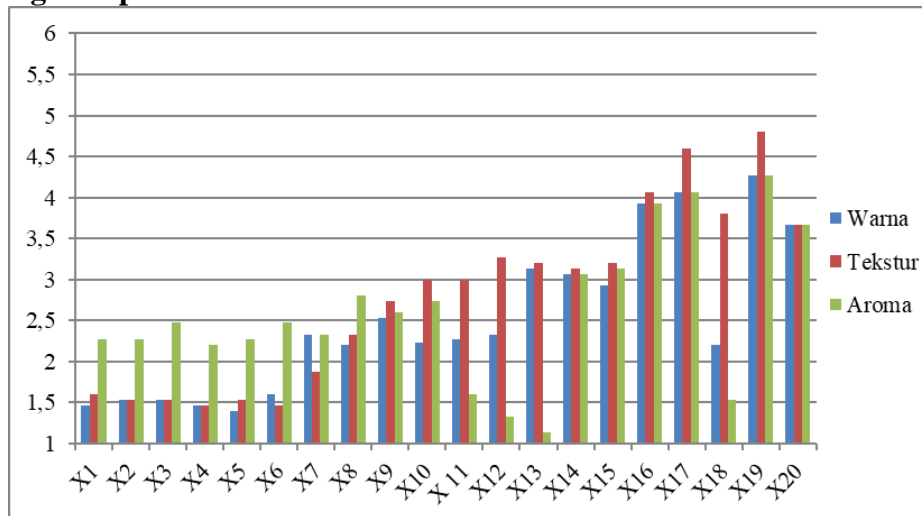
- Coffee Grounds Waste: 10 gr, 15 gr, 20 gr, 25 gr, 30 gr;

- Lime Peel: 2 gr, 2.5 gr, 3 gr, 3.5 gr, 4 gr;
- 3) Dependent variable
- Organoleptic Test
  - Test pH
  - Homogeneity Test
  - Microbial Contamination Test
  - Irritation Test
  - Humidity Test

### **RESULTS AND DISCUSSION**

This research was conducted to utilize coffee grounds and lime peel waste with the aim of increasing the use value and economic value of this waste. Coffee grounds and lime peel can be used to make body scrubs for skin care as a moisturizer. Apart from increasing the economic value of using this waste, it can also reduce the impact of environmental pollution. Coffee grounds are useful as a scrub to remove dirt on the surface of the skin. So the skin becomes softer. Coffee grounds also contain ingredients that are good for health, namely caffeine which is useful for providing a gentle effect on the skin. Coffee grounds also contain antioxidant oils which soften the skin[4]. In lime peel you can also find vitamin C which can absorb oil from the skin and remove dead skin cells so that the skin looks cleaner, softer and brighter.[5]. The difficulty in making a body scrub from coffee grounds and lime peel extract is to get lime peel because lime peel is very thin and must be collected little by little first and is also the result of the extraction process which produces very little thick extract. The advantage of making a body scrub from coffee grounds and lime peel extract is that it is absorbed more quickly by the body because it is a natural ingredient and usually does not cause allergic side effects.

## 1. Organoleptic Test



Picture 1. Organoleptic Test

Based on Picture 1, it can be seen that the body scrub preparation that the panelists liked most was found in sample X19, namely with a proportion of 30 grams of coffee grounds and 3.5 grams of lime peel extract. This is because the preparation is brown in color, smells of coffee and perfume and has a denser texture and is not too runny, the panelists preferred a body scrub with a texture like this.

### 1. Color

Based on Picture.1 above, the average color value of the body scrub above, the highest average value is the one that meets the brownish black color criteria, namely in sample X19 with a ratio of 30 grams of coffee grounds and 3.5 grams of lime peel extract with a brown color. The lowest average color value is X5 with a ratio of 15 grams of coffee grounds and 4 grams of lime peel with a slightly pale brownish color.

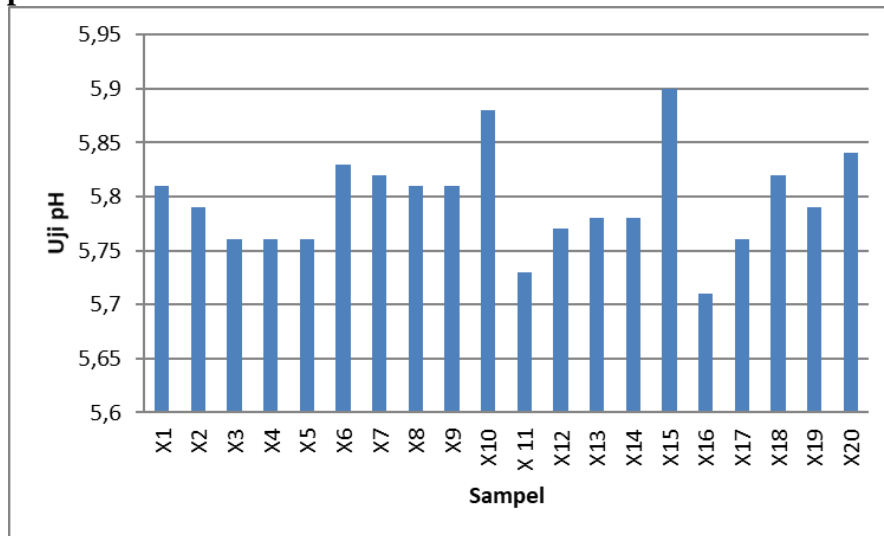
### 2. Aroma

Based on the diagram above, the average value of the aroma in the body scrub above, the highest average value is lime peel 3.5 grams. The lowest average aroma value was in sample X13 with a comparison of 25 grams of coffee grounds and 3 grams of lime peel extract. The resulting aroma was slightly sour.

### 3. Color

Based on the diagram above, the average color value in the body scrub above, the highest average value is X19 which meets the rough criteria so that when applied and rubbed it will remove dirt on the surface of the skin, namely in sample lime 3.5 grams. The average texture value was obtained by sample X4 with a ratio of 15 grams of coffee grounds and 3 grams of lime peel extract.

## 2. Test pH



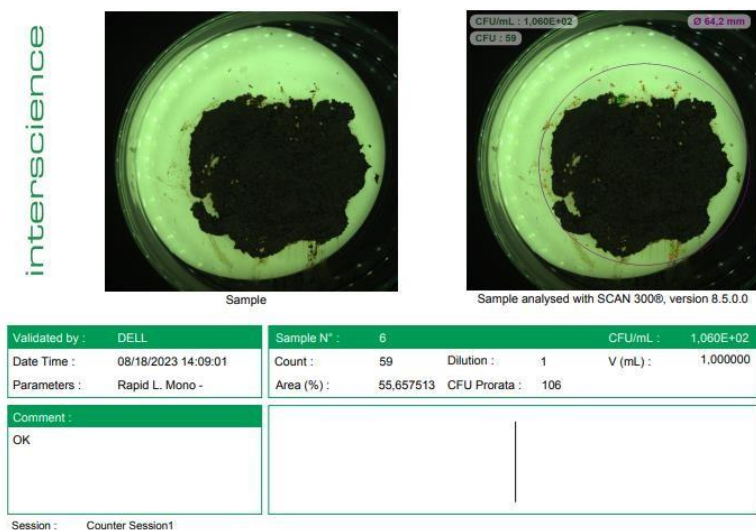
Picture 2. pH test

The addition of coffee grounds has a big influence on the pH of the body scrub, based on Picture 2, the resulting body scrub meets body scrub quality standards, namely a pH of 4.5-8.0, which means the body scrub can be used on the skin. If a body scrub has a pH that is too acidic it can cause irritation to the skin because if it is more acidic it can cause the skin to become dry, whereas if the pH is too acidic it can cause the skin to become scaly.

## 3. Homogeneity Test

Based on the results of homogeneity observations, it shows that sample preparations X1 to X7, X13, X15, X16, Inhomogeneous preparations are caused by processes during the melting of the oil phase and poor grinding, resulting in inhomogeneous preparations.

#### 4. Microbial Contamination Test



Picture 3. Colony Test Results for Sample X19

Laboratory test results show that the three best samples, namely Even though it still contains microbes, the types of *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Candida albicans* are not found in body scrub products.

#### 5. Irritation Test

Irritation test, this test is carried out on the preparation to determine the irritating properties of the preparation. A positive reaction to irritation is characterized by redness, itching, or swelling on the treated skin. Iri irritation was carried out 3 times a day on 3 volunteers using a body scrub behind the ears and then observed to see if there were any changes. The irritation test was carried out using the 3 best samples, namely X16 (30 grams of coffee grounds: 2 grams of lime peel extract), X17 (30 grams of coffee grounds: 2.5 grams of lime peel extract), and .5 grams of lime peel extract).

#### 6. Test the Effectiveness of Preparation Moisture on Volunteers

Measurement of effectiveness was carried out by measuring the initial condition of the volunteers' skin, which included moisture and brightness. This aims to see how big the effect of body scrub made from coffee grounds and lime peel extract is used in skin care.

For the moisture test, it is measured using a skin analyzer. The moisture test was carried out using the 3 best samples, namely X16 (30 grams of coffee grounds: 2 grams of lime peel extract), X17 (30 grams of coffee grounds: 2.5 grams of lime peel extract), and .5 grams of lime peel extract) .



## CONCLUSION

Based on the results of research on the use of coffee grounds (*Coffea*) and lime peel extract (*Citrus aurantifolia*) it can be concluded that the effect of coffee grounds (*Coffea*) on the finished body scrub is that the more coffee grounds the resulting body scrub is, the better it is, in this research The best body scrub content is 30 grams of coffee grounds so that the resulting body scrub is semi-solid and is preferred by the writer while the minimum body scrub content is 15 grams. The writer doesn't like it because it is too runny for the body scrub cream category, so from this research it can be concluded that the grounds Coffee can be combined to make a body scrub that can moisturize the skin. Lime peel extract (*Citrus aurantifolia*) can be used as a combination to make a body scrub. Use the best combination of lime peel extract, namely 3.5 grams. Body scrub from coffee grounds (*Coffea*) and lime peel extract (*Citrus aurantifolia*) can increase moisture in the skin.

## ACKNOWLEDGEMENTS

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