
Physical Test of Avocado Leaf Extract Cream Formula

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Abstract: *Avocado (Persea americana Mill) is a plant that grows widely in subtropical and tropical areas, one of which is Indonesia. The leaves of the avocado plant, which we can use as traditional medicine, are reported to be anti-bacterial and can inhibit the growth of several bacteria, including Staphylococcus aureus. The active substances contained in avocado leaves are flavonoids, quercetin and tannin which are useful as anti-bacterials and as a source of natural antioxidants. This study aims to determine the results of the physical test of the avocado leaf extract cream formula. This type of research is quantitative with a descriptive research design. In testing the cream, an organoleptic test, homogeneity test, pH test, spreadability test, absorption test and adhesion test were carried out. The results obtained in the organoleptic test were seen from the yellowish brown color, the semi-solid dosage form, and the distinctive creamy smell of avocado leaves, the homogeneity test of the cream did not occur in phase separation, namely the water phase and the oil phase, the pH test of the cream had a pH of 7, the power test Spread the cream with a diameter of 6.1 cm, the cream's absorption test can absorb water optimally, and the cream's adhesion test obtains an adhesion time of 1.48 seconds. The physical test of the avocado leaf extract cream formula meets the requirements.*

INTRODUCTION

Plants are biodiversity that is always around us, whether they grow wild or are deliberately cultivated. Since ancient times, plants have been used as medicinal plants, although their use has been spread from generation to generation or by word of mouth (Yuniarti, 2008: 3). One of the plants that can be used as traditional medicine is *avocado*, often called avocado (*Persea americana* Mill), which is very common in Indonesia. Even though it is not native to Indonesia, its existence is no longer foreign to the public. We can find avocado plants in tropical climates (Hetty, 1992: 5). Avocado (*Persea americana* Mill) itself belongs to the *Lauraceae* plant family which grows widely in tropical and subtropical areas. This plant is one of the most important medicinal plants and is used as a traditional medicine for treatments such as canker sores, urinary stones, high blood pressure, dry facial skin, toothache, swelling due to inflammation and diabetes

(Perry, 1987; Wijayakesuma, 1996).

The avocado plant (*Persea americana* Mill) which we can use as traditional medicine is found in the leaves, it is reported to be anti-bacterial and can inhibit the growth of several bacteria such as *Staphylococcus aureus stain A and B*, *Staphylococcus albus*, *Pseudomonas sp*, *Proteus sp*, *Eschericeaesp*, and *Bacillus subtilis* (Wijayakesuma, 1996). Analysis of the chemical contents of this plant that have been isolated are saponins, alkaloids, flavonoids, terpenes, safrole, and tannins (Wijayakesuma, 1996; Wiart, 2002). The active substances contained in avocado leaves (*Persea americana* Mill) are flavonoids and quercetin (Mursito, 2007: 41). Avocado leaves are very easy to get, but some people only know about the use of avocado leaves by pounding them traditionally and they look less attractive in this modern era, which causes these products to have a low selling value and are difficult to market. Therefore, to increase the selling value of processed avocado leaves by making cosmetics in the form of cream preparations.

Cosmetics are one of the most important parts of appearance with various types including powder, face cream and masks (Tranggono, *et al.*, 2007). One form of cosmetic preparation that is often used is cream. Cream is a semi-solid preparation in the form of a thick emulsion containing no less than 60% water and is intended for external use (Ministry of Health of the Republic of Indonesia, 1978). Cream is used as a semi-solid preparation that has a relatively liquid consistency, formulated as a liquid emulsion in oil (o/w) or oil in water (o/w) (Budiasih, 2008). The definition of cream is an external medicine that is applied to the skin of the body. External medicine is medicine that is not used through the mouth, esophagus and stomach, but external medicine is medicine that is used as wound medicine, skin medicine, nasal medicine, eye medicine, ear drops, hemorrhoid medicine, injections and others. Apart from that, cream has basic qualities, namely stable, soft, easy to use, evenly distributed (Anief, 1994).

Times are modern, today's technology can be used to make a product using ingredients that are widely available, but until now there has been no cream formula prepared from avocado leaf extract. The cream formulation uses the main ingredient of avocado leaves which is rich in anti-bacterial benefits and as a source of natural antioxidants. Making a cream formula from avocado leaf extract (*Persea americana* Mill) requires physical testing which includes organoleptic tests, homogeneity tests, pH tests, spreadability tests, absorption tests and adhesion tests.

RESEARCH METHODS

This type of research is quantitative research. Quantitative research is a type of research which is the result of research data that has been obtained in the form of data analysis figures (Sugiyono, 2012). In this research, data results will be obtained in the form of numbers, namely the results of the physical test of the avocado leaf extract cream formula.

The research design used is a descriptive design. Descriptive design is research conducted to describe or describe a phenomenon that occurs in society (Notoatmodjo, 2012). This research was intended to observe the physical test of the avocado leaf extract cream formula.

Research materials and tools

1. Extraction materials and tools

Ingredients: avocado leaf simplicia powder , 96% ethanol

Tools: *beaker glass* , stirring rod, analytical balance, porcelain cup, measuring cup, *evaporator* , *water bath* , sieve, oven

2. Ingredients and tools for the avocado leaf extract cream formula (*Persea americana* Mill)

Ingredients: avocado leaf extract, liquid paraffin, alba sera, sorbitan monostearate, triethanolamine, distilled water

Tools: glass, stirring rod, cotton, evaporator, *water bath*, dropper pipette, porcelain cup, cream container, pH meter, petri dish, transparent glass, filter paper, spoon, and analytical balance

3. Materials and tools for physical testing of the avocado leaf extract cream formula (*Persea americana* Mill):
 - a. Organoleptic test
Organoleptic testing of the avocado leaf extract cream formula using the five senses of research
 - b. Homogeneity test
Avocado leaf extract cream formula with transparent glass and stirring rod.
 - c. Test pH
Avocado leaf extract cream formula with pH paper.
 - d. Spreadability test
Avocado leaf extract cream formula with round glass and caliper.
 - e. Absorption test
Avocado leaf extract cream formula with transparent glass, dropper pipette and water
 - f. Test adhesion
Avocado leaf extract cream formula with transparent glass and *stopwatch*

Research steps

1. Simple preparation
Avocado leaf simplicia comes from Oemah Djamoé Arroyan, taken directly and dry sorted to separate the avocado leaves from foreign materials brought in during the previous process. Simplicia avocado leaves that have been sorted are dried and then blended until they become powder. The powder obtained was then sifted using a sieve and weighed 250 grams.
2. Making avocado leaf extract (*Persea americana* Mill).
Extraction was carried out using the maceration method, the solvent used was 96% ethanol, by extracting 250 grams of simplicia powder, maceration was carried out for 5 days with daily stirring, then remaceration for 1 day. The maserate obtained is then concentrated using *an evaporator* and evaporated over *a water bath* until a thick extract is obtained, then the extract yield is calculated using the formula:

$$\text{Yield} = \frac{\text{Thick extract weight}}{\text{Weight of simplicia powder}} \times 100\% =$$

3. Determination of the formula for extract cream and avocado (*Persea americana* Mill)
Determining the cream formula was first carried out by *trial and error* which was carried out in pre-laboratory experiments using the basic formula for making cream according to Juwita, et al., 2013, then looked at the consistency of the cream and the homogeneity of the cream to see whether it met the requirements for a good cream, namely soft and not cracked. separation of oil phase and liquid phase. There are 3 best formulas from the results of pre-laboratory experiments carried out further physical testing for this selection, as follows:

Table 1. Formula of Avocado Leaf Extract Cream (*Persea americana* Mill) in Pre-Laboratory Experiments

Material	F1	F2	F3
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Avocado leaf extract	10	10	10
Liquid paraffin	47.5	45	42.5
<i>Cera alba</i>	14.2	13.5	13
Sorbiton monostearate	1.9	1.8	1.7
Triethanolamine	3	2.8	2,4
<i>Aquadest</i>	28.5	27	25.5

Manufacturing procedure:

1. Materials in the water phase (triethanolamine and distilled water) are separated from materials in the oil phase (alba sera, liquid paraffin, and sorbitan monostearate). The water phase is dissolved by heating using *a hot plate* . Meanwhile, the oil phase is melted in a water bath at a temperature of 70°-75°C. After everything has dissolved, the water phase is slowly added into the hot mortar containing the oil phase and then stirred at a constant speed until a creamy mass forms. The weighed avocado leaf extract (*Persea americana Mill*) *is mixed into the cream base little by little until homogeneous.*
2. Physical test of the avocado leaf extract cream formula (*Persea americana Mill*)
 - a. Organoleptic test
Organoleptic tests were carried out on the physical appearance of the cream formula. The examination carried out includes shape, smell and color, when applied to the skin (Nugraha, 2012).
 - b. Homogeneity test
Homogeneity test is carried out by placing the cream formula between two glass Then noticed exists particle Which roughness or inhomogeneity under light (Hasibuan, 2014). Cream is considered homogeneous if there are no particles rough or that color No mixed under light.
 - c. The pH test is carried out using pH paper smeared with a small amount of cream. The measurement results are compared with the pH range according to the color changes that occur on the pH paper (Nugraha, 2012). The pH test shows the degree of acidity of a material. The normal pH of human skin ranges from 4.5–6.5 (Draelos, 2006 in Nugraha, 2012).
 - d. Test spread power
Power spread formula tested with emphasized two glass plate on 0.5 grams of cream formula, measured power spread over the glass surface with each additional load, namely 50 grams, 100 grams, 150 grams and 200 grams. Measurement wide circle done after One minute additional load. The spreadability of semi-solid dosage forms ranges on diameter 5 cm until 7 cm (Garg, 2002 in Nugraha, 2012).
 - e. Absorption test
The absorption test was carried out by placing 1 gram of cream on glass transparent, Then dripped with water Using a 1 ml pipette, add approximately 20 drops of water. Test This aim For know ability cream in absorb water. The cream absorbs water to the maximum, if cream Already No absorb water Again, so that happen separation between cream and water. Test the absorption capacity on the skin must have appropriate solubility in minerals and water with rate more from 1 mg cream can late in 1mg water (Juwita, *et al.*, 2013).
 - f. Test sticking power

Power sticky cream tested with method put cream sufficient area on the object glass that has been determined, Then another glass object is placed on top of the preparation the. Glass object the Then given burden as big as 1 kg for 5 minutes. The object glass is placed on the test equipment. Tool The test is in the form of a load hanging from one of the glasses object. Time noted after second glass object regardless. The adhesive force of semisolid dosage forms is more than 1 second (Zats And Gregory, 1996 in Nugraha, 2012).

RESULTS AND DISCUSSION

1. Results of making avocado leaf extract cream (*Persea americana* Mill)

a. Results of avocado leaf powder (*Persea americana* Mill)

First, we powder 250 grams of avocado leaf simplicia as needed. Avocado leaf simplicia which has been blended into powder and filtered using a sieve has the form of a fine powder with a brownish green color. Avocado leaf powder has a distinctive pleasant smell from the avocado leaf itself. Avocado leaf powder can be seen in figure 1.



Figure 1. Avocado leaf powder

b. Extraction of avocado leaf cream formula (*Persea americana* Mill)

In this research, avocado leaf extraction used the maceration and remaceration method with 2.5 liters of 96% ethanol solvent. The final result of the extraction is a thick, dark green-brown colored extract which has the characteristic pleasant smell of avocado leaves. The thick extract produced weighed 29.14 grams. The extract yield obtained based on the ratio of the weight of the thick extract to the weight of the simplicia powder was 11.656%.

c. Avocado Leaf Extract Cream Base (*Persea americana* Mill) in Pre-Laboratory Experiments

In pre-laboratory experiments, after *trial and error* using the basic formula for making cream according to Juwita, et al., 2013, the best formula results were obtained, namely soft and no separation of the oil and water phases, found in the following formula:

Material	F3 (g)
Avocado leaf extract	10
Liquid paraffin	42.5
<i>Cera alba</i>	13
Sorbiton monostearate	1.7
Triethanolamine	2,4

2. Physical Test Results of Avocado Leaf Extract Cream Formula (*Persea americana Mill*)

a. Organoleptic test

The organoleptic test was carried out by observing the color, shape and smell of the avocado leaf extract cream. The organoleptic test results describe the avocado leaf extract cream as semi-solid, yellowish brown in color and has a pleasant smell typical of avocado leaves. The preparation of avocado leaf extract cream can be seen in Figure 2 as follows.



Figure 2 Organoleptic test of avocado leaf extract cream preparation

b. Homogeneity test

The homogeneity test is carried out by placing the cream formula between two transparent glasses and then observing whether there are coarse particles or inhomogeneity under light (Hasibuan, 2014). The results of the homogeneity test describe that the avocado leaf extract cream does not contain coarse particles or that there is no separation of the oil phase and the water phase under light. The homogeneity test of the avocado leaf extract cream can be seen in Figure 3 as follows:

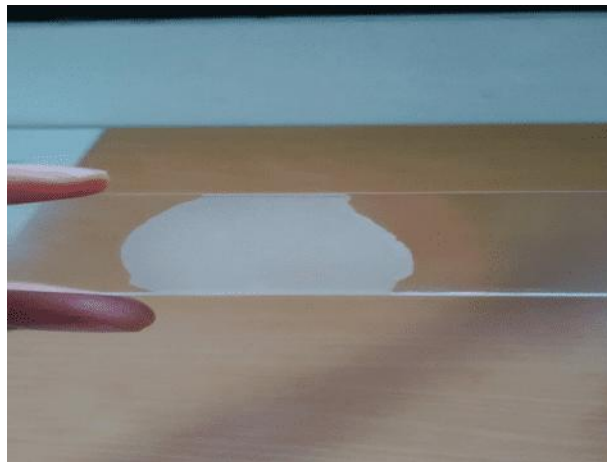


Figure 3. Homogeneity test of avocado leaf extract cream

c. Test pH

The pH test is carried out using pH paper smeared with a small amount of cream that has been dissolved in 10ml of water first to check. The pH test results for avocado leaf extract cream have a pH of 7, indicating that the pH of the cream is alkaline. The pH test shows the degree

of acidity of a material, with the normal pH of human skin ranging from 4.5-6.5 (Draelos, 2006 in Nugraha, 2012). The pH test of avocado leaf extract cream can be seen in Figure 4 as follows:



Figure 4. pH test of avocado leaf extract cream

d. Spreadability test

The spreading power test was carried out by pressing two glass plates with 0.5 grams of cream formula, after which the spreading power was measured on the glass surface at each additional load. The spreadability test results of the avocado leaf extract cream, which has a diameter of 6.1cm, show that the spreadability test complies with the provisions. The spreadability of the cream formula ranges from 5cm to 7cm in diameter (Garg, 2002 in Nugraha, 2012). The spreadability test of avocado leaf extract cream can be seen in Figure 5 as follows:

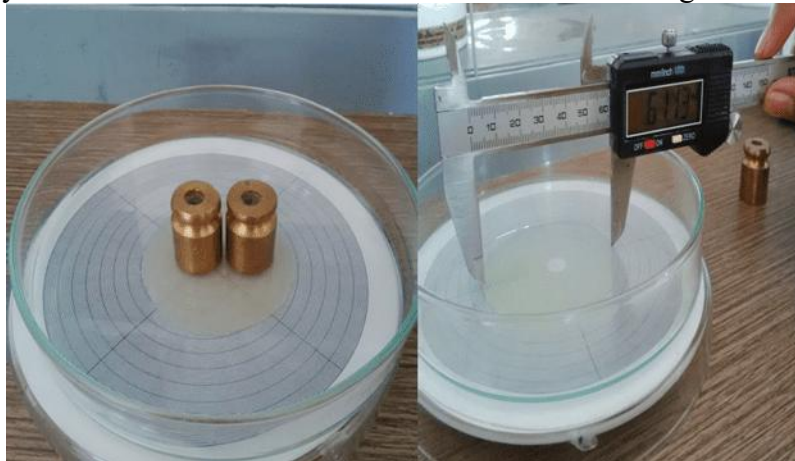


Figure 5. Spreadability test of avocado leaf extract cream

e. Absorption test

The absorption test was carried out by placing 1 gram of cream on a transparent glass, then dripping it with water using a 1ml pipette with approximately 20 drops of water with the aim of determining the cream's ability to absorb water (Juwita, *et al.*, 2013). The results of the absorption test describe that this water-soluble avocado leaf extract cream shows that the absorption test complies with the provisions. The absorption test for avocado leaf extract cream can be seen in Figure 6 as follows:



Figure 6. Absorption capacity test of avocado leaf extract cream

f. Test adhesion

The adhesion test is carried out by placing enough cream on a glass object of a predetermined area, then the glass is given a weight weighing 1 kg for 5 minutes. The time is recorded after the two glass objects are separated. The adhesion test results for the avocado leaf extract cream were 1.48 seconds, showing that the adhesion of the avocado leaf extract cream complies with the provisions. The adhesive force of semi-solid dosage forms is more than 1 second (Zats and Gregory, 1996 in Nugraha, 2012). The adhesion test for avocado leaf extract cream can be seen in Figure 7 as follows

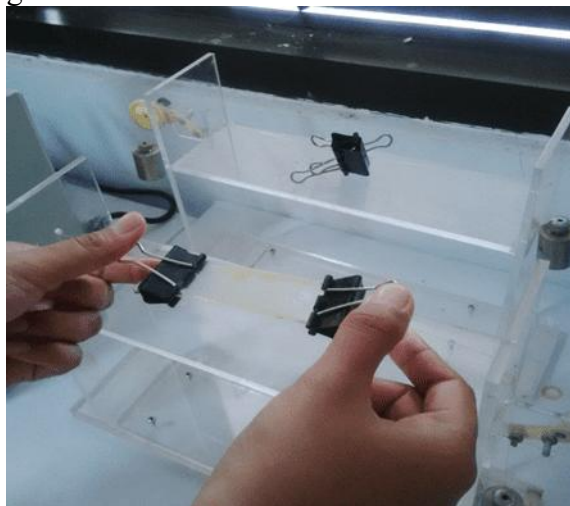


Figure 7. Adhesive test of avocado leaf extract cream

CONCLUSION

The organoleptic test results of the avocado leaf extract cream showed that the cream was semi-solid, yellowish brown in color and had a pleasant smell typical of avocado leaves.

The results of the homogeneity test of avocado leaf extract cream showed that the cream did not contain coarse particles or there was no separation of the oil phase and the water phase under light.

The pH test results of the avocado leaf extract cream produced had a pH of 7 and met the

requirements.

The results of the spreadability test of avocado leaf extract cream produced a spreadability with a diameter of 6.1 cm and met the requirements.

The results of the avocado leaf extract cream absorption capacity test showed that the cream could absorb water optimally and in accordance with the provisions.

The results of the adhesion test for the avocado leaf extract cream obtained the adhesion time

1.48 seconds and meets the cream phase criteria.

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