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TEST OF FORMAL AND PHYSICAL PROPERTIES FOR PREPARATION OF TOFUMASA KOLANG-KALING SEED POWDER COMBINE (*Arenga pinnata* L.) CREAM SHELL

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ABSTRACT

Tofu waste is waste from the tofu processing industry that has hardly been used except as animal feed or simply thrown away. Kolang Kaling is widely used as a processed food in the community. The aim of this study was to prepare creamy peeling formulas from tofusae and kolang-kaling seeds. This study started with the preparation of tofu powder and tofu clay, then a creamy exfoliating preparation was made from the second combination in the ratio (1:1; 1:3 and 3:1). Physical testing of the cream peeling formulations was then performed in the form of organoleptic, spreadability, stickiness, cream type, protection test, pH test and preference test. The results obtained in the form of Formula I with the ratio (1:1) are the best compared to the other two formulas.

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Introduction

Tofu waste is waste from the tofu processing industry that has hardly been used except as animal feed or simply thrown away. Instead, tofu contains compounds in sawdust that are almost identical to the hormone estrogen, namely isoflavones, which act as natural antioxidants to reduce premature aging. So that tofu pulp can be used as a cosmetic (Ningsih et al., 2015). Public

shortage of tofu sawdust makes tofu sawdust an unused waste (Fridata et al., 2018). The nutritional value of tofu sawdust with residual soy extract is relatively high. The use of tofu sawdust is still very limited, which may be because of its unpleasant taste, which is bitter and bitter, and its purity cannot be guaranteed, because the hygiene conditions of the company are generally not good. If there is too much production, this tofu is often thrown

away, further polluting the environment (Rahayu et al., 2016).

Kolang-kaling is a fruit made from a palm tree (*Arenga pinnata*). Kolang Kaling is widely used as a processed food in the community. Generally, processed kolang-kaling is a soft textured kolang-kaling, while old kolang-kaling is rarely used and even discarded because its texture is usually hard and less desirable. The protein content of kolang-kaling is quite low, but the benefits of this fruit flour can be maximized by adding mask base and pectin content to kolang-kaling, so it can help overcome skin moisture, promote skin regeneration. in the process and can help with exfoliation or removal. dead skin cells (Sulatri et al., 2015).

The fiber and mineral content of 100 grams of kohlrabi is 27 kcal of energy, 0.4 g of protein, 0.2 g of fat, 6 g of carbohydrates, 1.6 g of fiber, 91 mg of calcium, 243 mg of phosphorus, and 0.5 mg of iron and water.reaches 9 %. The high concentration of minerals such as calcium, iron and phosphorus is very effective in keeping the body fit and healthy. In addition, it also contains vitamins A, B and C. At the same time, the body-soluble potassium, iron, calcium, vitamin A, vitamin B, vitamin C and gelatin content work in collagen synthesis. Kolang-kaling also contains albumin up to 60 g, ash content about 1 g and crude fiber 0.95 g. Kolang Kaling has a very high water content of 93.6% but also contains 2.344 % protein, 56,571 carbohydrates and 10.52 % crude fiber (Muliyawan and Suriyana, 2013).

Exfoliation is the right treatment to remove dead skin cells because it has fine granules. In addition, peels also contain various substances that can provide different benefits to the skin, such as skin brightening, smoothing, softening and whitening. Dry skin needs exfoliating products that contain substances that help maintain skin moisture, prevent premature aging of the skin (Daswi, et al., 2020).

The novelty of this research is the development of peel off cream preparations

from tofu dregs powder combined with fro which originally came from ordinary powder masks so that there was preparation development from formulation technology. Based on the previous background, the researcher is interested in testing the composition and physical properties of tofu cream peeling products used with kolangkaling seed powder (*Arenga pinnata* L.).

Materials and Methods

The basis for using the existing method refers to previous research, namely Annisa's research (2019) on mask powder from tofu dregs combined with fro which is only for making ordinary mask powder. Whereas in this study it was developed into a peel-off cream preparation based on Puspito's reference (2021).

The method used refers to Puspito (2021) because the researcher formulated a peel-off mask preparation from a different sample, namely a combination of mango peel powder and carrot powder.

In this study, the composition of tofu seed powder and kolang kaling seed powder was used in the ratio (1:1; 1:3 and 3:1). In addition, stearic acid, cetyl alcohol, glycerin, methylparaben, propylparaben and petrolatum are used. This study leads to testing physical properties of exfoliating cream formulations in the form of organoleptic test, spreadability, stickiness, cream type, protective efficacy test, pH test and preference test.

Cream preparation Preparation

The cream formula was prepared with tofu sawdust and kolang-kaling seed powder up to 50 g, ie. formula I (5 g and 5 g), formula II (7.5 g and 2.5 g) and formula III. (2.5 g and 7.5 g). The required stearic acid 10%, TEA 10, cetium alcohol 5%, glycerin 5%, methylparaben 0.2%, propylparaben 0.2%, petroleum jelly 20%, distilled water is sufficient for 50 ml. Place stearic acid, cetyl alcohol and petrolatum in an evaporating dish and melt (mixture 1). Methylparaben was

added and dissolved in boiling water in a mortar (mixture 2). Propylparaben dissolved in glycerin (mixture 3). Add mix 1 and 3 to mix 2 and mix until smooth. Then add tofu powder and kolang-kaling seed powder, mix well and put in a bowl (Puspito, 2021).

Test of physical properties of preparations

Sensory Tests

Sensory tests detect the physical appearance of preparations by observing the shape, color and smell of finished preparations (Progestin, 2018).

pH Test

The pH test was performed using universal pH paper. The preparation is applied with a pH meter, after application the preparation is left to stand for some time, observing the color that develops according to the color of the pH scale (Progestin, 2018).

Cream Type Test

- a. **Color method** The color method involves applying a cream exfoliating product to the product and then dropping methylene blue (water color). If the color is microscopically uniform, the exfoliating cream is of the oil-in-water type.
- b. **Dilution method** To perform this method, the detergent is placed in a test tube, then enough water is added to the test tube and shaken. The changes that occur are observed, if there is oil, then the product is in M/A form, and if there is no change, it becomes creamy.
- c. **The ring method** The ring method involves applying a cleaning agent to the filter paper and observing the changes that occur. If there is oil on the filter paper, the cleaning agent is type A/M, but if there are oil stains, it is type M/A cleaning agent (Progestin, 2018).

Diffusion Test

The diffusion test was performed by weighing a maximum of 0.5 g of the product into the center of the watch glass. Place the second watch glass on top of the first watch glass, let stand for 1 minute, measure the diameter of the spreading cream scrub preparation. The same was done by adding a load of 100 g, the experiment was repeated 3 times (Progestin, 2018).

Adhesion Test

The adhesion test is performed by weighing the product to 0.5 g, after which the product is spread on a glass plate and another glass plate is placed on top of the product. Place the plate on the tester, load for 1 minute, release the load and record the time required to release the two plates (Progestin, 2018).

Protection Performance Test

The protection performance test was performed by inserting a 2.5 x 2.5 cm filter paper and dropping pp 1% indicator into it and distributing the product on the filter paper. Coat another 2.5 x 2.5 cm filter paper on both sides with melted solid paraffin. The filter paper is glued over the first filter paper. 1 N KOH was dropped and the time for a color change to appear was recorded (Progestin, 2018).

Probability Test

A preference test was conducted to assess panelists' preferences for exfoliating products on the market.

Results and Discussion

Results Characteristics of Tofu and Kolang Kaling Powder

The results of characteristics of Tofu and Kolang Kaling Soha powder are shown in Table 1 below.

Table 1 Results Properties of Tofu and Kolng-Kaling Powder

Parameter	Results Characteristics of Tofu Dregs (%)	Kolang-Kaling Characteristic Results (%)	Parameter MMI (1995)
Water content	5,67%	7,33%	≤ 10%
Water soluble essence	5,06%	15,1%	≤ 30%
Ethanol soluble extract content	10,88%	33,83%	≤ 40%
Total ash content	2,92%	1,39%	≤ 2%
Acid insoluble ash content	0,97%	0,42%	≤ 1%

The simplified characterization included determination of water content, determination of water-soluble extractive content, determination of ethanol-soluble extractive content, determination of total ash content, and determination of acid-insoluble ash content. Characterization of *Simplicia* was done to ensure uniformity of *Simplicia* quality. Several factors that can affect the study of the characterization of the butterfly are the raw material of the butterfly, the place where the butterfly grows, the age of the butterflies, the method of preparation and preservation.

Determination of water content is done in a simple way, which is used to determine the level of water content. Determining the water content of *simplicia* is very important to obtain the limit of the maximum water content of *simplicia*, because a large amount of water can be a platform for the growth of bacteria and fungi that can damage the compounds in *simplicia*. According to the current standard parameters, the water content requirement of *Simplicia* is a maximum of 10%. The moisture content determination results of tofu sawdust and kolang kaling powder were 5.67% and 7.33%, respectively, indicating that *simplicia* met the standard requirements for water content.

The determination of the concentration of the water-soluble extracts was carried out to determine the number of compounds that can be introduced in a simple sense by the polar aqueous solution contained, while the determination of the concentration

of the ethanol-soluble extracts was not made. . compounds that can be attracted to polar or polar ethanol solvents. nonpolar simplified. The results of determining the content of water-soluble extract of tofu powder was 5.06% and the results of determining the content of water-soluble extract of kolang-kaling powder was 15.1%, while the results of determining the content of water-soluble. kolang kaling powder extract. was 15.1%. determination of ethanol-soluble essence concentration of 10.88% obtained from waste tofu powder and determination of ethanol-soluble extract concentration of kolang-kaling powder 33.83%. From these results, it can be concluded that the compounds in tofu bran powder and kolang kaling powder attract ethanol more than water, this can be seen from the determination of percentages of water-soluble extracts and water-soluble extracts. excerpts ethanol, where the percentage of ethanol-soluble extract is greater than the percentage of water-soluble extract. Thus, it can be concluded that the appropriate solvent for extracting tofu waste powder and kolang kaling powder is to use ethanol.

Determination of total ash content was performed to determine the mineral content from the initial process to the formation of ease. Total ash content refers to internal (plant tissue itself) and external (other impurities such as sand or soil) mineral content. The purpose of determining the acid-insoluble ash content is to determine the amount of impurities originating from sand or silicate soil. The determination results of the total ash

content of the tofu salt powder was 2.92% and the determination results of the total ash content of the kolang-kaling powder was 1.39%. the acid-insoluble ash content of tofu bran powder was 0.97%, and the acid-insoluble ash content of kolang-kaling powder was 0.42%.

Physical test results of the preparation of cream peeling combination with tofu sae and kolang kaling seeds

Sensory test results

Sensory test results were the aroma, color and texture of the cream peeling preparation with the combination. tofu and kolang from kaling seeds. kolang kaling seeds. The results of the sensory tests are shown in **Table 2** below.

Table 2 Sensory Test Results for The Preparation of Creamy Peeling Combination Consisting of Tofu Seeds and Kolang-Kaling Seeds

Formula	Trial to-	Organoleptic		
		Smell	Color	Texsture
F1	1	Mango	White	Semi Solid
	2	Mango	White	Semi Solid
	3	Mango	White	Semi Solid
F2	1	Mango	White	Semi Solid
	2	Mango	White	Semi Solid
	3	Mango	White	Semi Solid
F3	1	Mango	White	Semi Solid
	2	Mango	White	Semi Solid
	3	Mango	White	Semi Solid

A sensory test of the creamy scrubs, which include tofu and kolang-kaling bubatas in every iteration, is a distinct mango aroma. This distinctive scent comes from the mango fruit essence, which is added to the exfoliating

cream formula to enhance the initial aroma of the formulation. You can see pictures of creamy scrubs with tofu and kolang-kaling-seed combination in Figure 1 below.



Figure 1 Preparation of Scrub Cream Combination of Tofu Dregs and Kolang-Kaling Seeds (F1 (1:1); F2 (1:3) and F3 (3:1))

Results of Homogeneity Test

The purpose of homogeneity test of the exfoliating cream preparation is to determine whether all the components of the mask are

well mixed or not. It is important to do this test to know that the active ingredient is evenly distributed in the formulation and that there are no particle packs to achieve the best

possible effect. The results of the homogeneity test of the combination of tofu and fro mask powder formulations are shown in Table 3.

Table 3 Combination Homogeneity Test Results Tofu Dregs Cream Preparations Kolang-Kaling Seeds

Formula	Trial to-	Homogeneity
F1	1	Homogeneous
	2	Homogeneous
	3	Homogeneous
F2	1	Homogeneous
	2	Homogeneous
	3	Homogeneous
F3	1	Homogeneous
	2	Homogeneous
	3	Homogeneous

In each repetition of the tofu and kolang-kaling cream peeling preparations, no coarse grains were observed on the slide during observation, and the color was evenly distributed. This preparation is a homogeneous preparation.

pH Test Results

The purpose of the pH test is to determine the acid level of the preparation to match the pH of the local preparation. The pH test results of tofu and kolang-kaling combination exfoliating cream products are shown in Table 4.

Table 4 Average pH Test Results of Cream Scrubs Containing Tofu Seeds and Kolang-Kaling Seeds

Formula	Average pH
F1	5,9
F2	6,1
F3	6,1

The average pH of cream scrubs with different combinations of tofu and kolang-kaling is 5.9-6.1. The resulting pH corresponds to the skin pH standard (4.5-6.5). If the pH of the product is below .5, it means that the product is acidic and can irritate the skin. If the pH of the product is above 6.5, the product is alkaline and can cause dryness and peeling of the skin.

Lubricity Test Results

The purpose of the lubricity test is to determine the ability of an exfoliating cream product to be easy to spread or use. The test results of the combination of tofu-soha and kolang-kaling preparations are shown in Table 5.

Table 5 Test Results on The Effectiveness of the Combination of Tofu Seeds and Kolang-Kaling Seeds in Exfoliating Preparations

Formula	Average Dispersion (cm)
F1	5,5
F2	6,0
F3	5,7

Good dispersion widens the contact of the exfoliating preparation with the skin, so that the active ingredient is absorbed more quickly. With different varieties of tofu and kolang-kaling soha, the average spread of the cream peeler is 5.5-6.0 cm. These results

correspond to the standard of mask lubrication of 5-7 cm. Adhesion Test Results

The purpose of the adhesion test is to find out how long the cream lasts. Table 6 shows the stickiness test results of the combination of tofu sawdust and kolang kaling cream scrub production.

Table 6 Average Stickiness Test Results of Cream Scrubs Combined with Tofu Sawdust and Kolang-Kaling Seed Scrubs

Formula	Average Adhesion (detik)
F1	18,25
F2	14,51
F3	15,51

The longer the cream is sticky, the better it allows the active ingredient to be perfectly absorbed. Tofu and kolang-kaling with many different varieties, the average spread of creams is 14.43-18.25 seconds. It meets the requirements of a good decay of more than 10 seconds.

Cream Type Test Results

A cream type test was performed to determine the type of cream exfoliating product produced. The cream type test that was done showed W/A (oil in water). The type of oil in water improves the release of the active ingredient, because when it is used,

there is evaporation and an increase in the concentration of the soluble drug, which promotes absorption into the skin tissue, the type M/A is easily washed away. . water so that it is easy to wash off after using the exfoliator (Indratmoko et al., 2017). The type of cream used includes:

a. Color Method

This is done by spreading the cream preparation on a glass plate, dropping methylene blue and covering it with a glass slide and observing the uniformity of the color formed under a microscope and recording the results. The results of the color method are presented in Table 7.

Table 7 Color Method Test Results

Formula	Cream Type Color Method	Reactor	Results
I	M/A or A/M	<i>Methylen blue</i>	M/A
II	M/A or A/M	<i>Methylen blue</i>	M/A
III	M/A or A/M	<i>Methylen blue</i>	M/A

Cream type test results under the microscope, M/A (oil in water) type was obtained with three formulas. If the microscope shows an emulsion of the same color, the tested emulsion contains O/W (oil in water) after making the cream (Pramuditha, 2016).

b. Dilute Method

The cream dilution test was done by diluting the cream product placed in a test tube by shaking it with distilled water and observing the changes that occurred. The results of the dilution method test are shown in Table 8 below.

Table 8 Experimental Results of The Dilution Method

Formula	Cream Type	Results
I	Type M/A or A/M	M/A
II	Type M/A or A/M	M/A
III	Type M/A or A/M	M/A

Based on the evaluation results, creamy peeling products of type M/A (oil in water) were obtained. This is demonstrated by preparations that dissolve or break down in distilled water. Based on the literature obtained, the cream type test for the dilution method is M/A (oil in water).

c. The Ringa Method

The ring method was used to determine the type of cream peeling product being produced. This test was done by smearing a creamy peeling formulation on filter paper and then observing the shape of the ring that formed. The results of the ring method test are shown in Table 9 below.

Table 9 Results of The Ring Method Test

Formula	Cream Type Ring Test Method	Results
I	Type M/A or A/M	M/A
II	Type M/A or A/M	M/A
III	Type M/A or A/M	M/A

Based on the evaluation results, cream peeling products are of the M/A (oil in water) type, because there is a ring of water around the product. This is because the filter paper has a ring file (Rosmianti, 2018).

a protective effect against mechanical, chemical or thermal irritation. The characteristics of products considered good are based on observations lasting > 15 seconds. If there are no spots, it means that the cream is protecting the skin. The results of the protection test are given in Table 10.

Protection Test Results

The protection test is performed to determine how much the product can provide

Table 10 Mean Value Results of Protection Test Preparation of Peeling Combination of Tofu Seeds and kolang-kaling seeds

Formula	Medium Protection of Test Results (second)	Standard (Suhesti, 2014)
I	18,35	>15 second
II	19,41	
III	20,77	

The highest protection test average was found in the cream peeling formulation according to formula I, which was 18.35 seconds. This is because the dosage form is solid, so it can provide longer protection when applied to the skin surface and provide the

expected therapeutic effect for a long time. In the present study, therefore according to the standard based on the reference of Rahmawati (2010).

Preference Test Results

A preference test was conducted to determine whether panelists preferred cream

products containing a combination of tofu and kolang-kaling seeds. The results of the preference test are shown in Table 11 below.

Table 11 Results of the Preference Test

Formula	Evaluation		
	Scent	Color	Taste on The Skin
I	7	7,2	7,7
II	5,6	6	6
III	6,8	6,9	6,6

Based on the results obtained, the panelists preferred Formula I in a ratio of 1:1 compared to Formulas II and III.

Based on the results obtained in this study, the results of peel off masks had a homogeneous consistency and spreadability and better adhesion than ordinary powder masks due to the addition of additional ingredients such as glycerin, cetyl alcohol, stearic acid, methyl paraben, propyl paraben and petrolatum. So that peel off masks provide better consistency compared to regular powder mask preparations.

Conclusions

The composition of tofu ground flour and kolang-kaling seeds as a cream exfoliant can provide anti-aging properties based on the testing of general physical properties is in formula I in a ratio of 1:1.

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