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Test the Physical Properties of Eye Shadow Preparations with Natural Coloring of Temulawak (Curcuma Xanthorrizzha Roxb)

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ABSTRACT
Introduction: Temulawak contains curcuminoid compounds. Apart from curcuminoids, Temulawak also contains volatile substances such as isofuranogermakren, tricycline, alloaromadendren, germakren, and zanthorriza. Active components that are very effective as antioxidants in ginger rhizomes include curcumin, demotoksicurmin, and bisdemotoksicurcumin. Curcumin is a natural chemical compound that can be used for natural coloring. Objective: This research aims to find out whether ginger extract can be a safe and good natural coloring ingredient in eye shadow preparations that is in accordance with the physical properties test. Method: This research applies a total sampling method. The method used is the ginger juice extract method which is obtained directly or can be called an experiment. Conclusion: Curcuma extract can be used as a safe and effective natural coloring for eye shadow preparations, according to the results of physical properties tests which include organoleptic tests, pH tests, homogeneity tests, irritation tests, and liking tests.

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INTRODUCTION

Cosmetic and personal care products now play an important role in maintaining health, cleanliness, or simply improving appearance and self-confidence in everyday life, especially for women who want beauty and perfection. Cosmetics are care substances used to improve appearance. Cosmetic products are generally made from a mixture of chemicals, natural ingredients, or synthetic ingredients which function to improve appearance. The process of using cosmetics is called cosmetology or better known as make up. Make up aims to emphasize parts that are considered attractive and cover parts that are considered less attractive. Makeup is often chosen because it can have a positive effect on physical attractiveness. (Latief & Ayustira, 2020).

The correct and correct use of cosmetics will be beneficial for body health, to increase our attractiveness through make-up, increase self-confidence and feelings of calm, protect skin and hair from ultraviolet rays, pollution and other environmental factors (Berliana, 2018). According to Airlangga Hartono, various types of cosmetics with certain functions and benefits are now circulating in society, one of the cosmetic products that is often in demand

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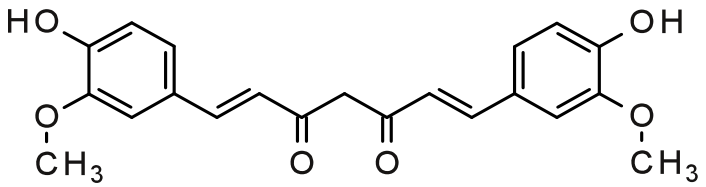
by women is eye shadow. This product is used to beautify the appearance of the eyes so they look more attractive (Cahya et al., 2021).

Eye shadow is a cosmetic product that is used on the eyelids below the eyebrows. As a type of decorative eye shadow, it requires safe ingredients and careful application because it is applied to the eye area (Diana et al., 2022). Eye shadow is a type of complementary make-up for facial make-up. Facial make-up is said to be good if the make-up for the eyes has eye shadow colors that stand out. Eye shadow is made in several dosage forms, including cream, stick, liquid, powder and compact (Setyaningsih, 2020).

Temulawak contains curcuminoid compounds. Apart from curcuminoids, Temulawak also contains essential oils such as isofuranogermakren, tricycline, alloaromadendren, germakren, and zanthorriza. It needs to be clearly understood that ginger rhizome has many benefits, the most prominent of which is its potential as an antioxidant. Active components that are very effective as antioxidants in ginger rhizomes include curcumin, demotoksicurmin, and bisdemotoksicurcumin. Curcumin is a natural chemical compound that can be used for natural coloring (Shaleha, 2023). Temulawak, known as Curcuma Xanthorrizha Roxb, is a plant species belonging to the Zingiberaceae family which is often used as traditional medicine. It was recorded that in 2019, ginger was cultivated in Indonesia with a harvest area of more than 13,042,873 m2 and produced 29,637,119 kg of ginger (Rahmat et al., 2021).

The main ingredients in ginger rhizomes are starch, curcuminoids and essential oils. Temulawak essential oil in Indonesia contains the main compounds consisting of accucurum (22.11%), β-curcumen (23.39%), curzeren (6.02%), camphor (4.98%), and zanthorrhizol (4.65%) (Rahman et al., 2022). Curcumin is an active compound found in the curcuminoid group. Curcumin is found in rhizomes such as ginger, turmeric, ginger, and plants that are members of the Zingiberaceae family. Curcuminoids are polyphenolic compounds related to yellow color, similar to turmeric, ginger and other Zingiberaceae plants. Substances contained in the curcuminoid group include desmetoxycurcumin and bisdesmetoxycurcumin. Curcumin is a phytopharmaceutical compound with several biological effects, including antidyslipidemia, antioxidant, antiinflammatory, antiviral and antifungal effects (Syamsudin et al., 2019).



Natural dyes are curcuminoid compounds which can give an orange or yellow color, curcumin pigments can dissolve in ethanol and glycal acetic acid, and remain stable when exposed to light. Eye shadow preparations made from teulawak rhizome extract are a natural coloring because they contain curcumin which gives a bright orange yellow color and is an antioxidant and antimicrobial (Azizah Syahrana et al., 2024).

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Testing the physical properties of eye shadow preparations is very important to determine the quality of the product produced. Some physical properties that need to be considered include color, smooth texture, durability, and non-irritation. When making eye shadow, dye is the most important ingredient. Coloring materials consist of synthetic dyes and natural dyes. Synthetic materials used over a long period of time can cause health problems. So it is necessary to look for safer alternative dyes, namely natural dyes using herbal ingredients, one of which is ginger (Curcuma Xanthorizza Roxb).

METHODS

Tools and materials

The tools that will be used in this research process are mortar and stamper, blender, stirring rod, beaker glass, filter paper, flannel cloth, horn spoon, separating funnel, cup, spirit stove and tripod, analytical scales, oven, litmus paper, pH paper, sieve (Mesh 60 and 100) eye shadow printer pallet. The ingredients used in this research are ginger (Curcuma Xanthorrizha Roxb), talcum, titanium oxide, lanolin, kaolin, paraffin liquid, nipagin, perfume (Ol. Rosae).

Research Procedures.

a. Sample Collection
   The sampling carried out consisted of several stages, the first was the sample collection stage, at this stage the sample was taken from fresh ginger. The second stage is wet sorting, wet sorting is carried out to separate impurities or foreign materials such as soil that stick to the sample. The third stage is washing, washing is carried out to clean dirt that is present or attached to the sample. The final stage is the chopping stage, the chopping is carried out in the form of cutting sections of the sample to make grinding the ginger easier.

b. Make Temulawak Extract
   Curcuma extract is made from direct pressing, namely by grinding it using a blender and then squeezing it. Collect the juice from the ginger juice (Curcuma Xanthorrizha Roxb) in a glass beaker and separate it from the dregs. To ensure that the turmeric juice is separated from the dregs, it is filtered three times. The first filtering is done using flannel cloth. The second filtering is done with flannel cloth and filter paper. The third filtering is done with a hard filter. The ginger juice extract is then collected into a glass beaker.

c. Formula Eye Shadow

No	Material Name	FI	F II	F III	Function	Bibliography
1	Exstrak Temulawak	20%	30%	40%	Active Substances	Ii Carrista at. Al,. 2020
2	Titanium Oksida	9%	9%	9%	Additives	Putri Nirmala Sari H, 2018
3	Kaolin	5%	5%	5%	Anti-irritants	Putri Nirmala Sari H, 2018

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No	Material Name	FI	F II	F III	Function	Bibliography
4	Lanolin	3%	3%	3%	Moisturizers and Binders	Putri Nirmala Sari H, 2018
5	Nipagin	1%	1%	1%	Preservatives	Putri Nirmala Sari H, 2018
6	Parafin Liquid	3%	3%	3%	Hardeners	Putri Nirmala Sari H, 2018
7	Ol.Rosae	q.s	q.s	q.s	Fragrances	Putri Nirmala Sari H, 2018
8	Talkum	Ad 10g	Ad 10g	Ad 10g	Additives	Putri Nirmala Sari H, 2018

d. Making Eye Shadow

The first thing to do when making eye shadow is to prepare the tools and materials that will be used. First heat the lanolin binding agent until it melts. Each powdered material such as titanium oxide, kaolin and nipagin is ground in a mortar, then add the ginger juice in a different mortar and add the talcum little by little, grind to a homogeneous mass and mix the two masses, grind again until the two masses are homogeneous, after that add the melted paraffin liquid and lanolin, grind the mixture until a compact mass is obtained. Then dry it in a drying cupboard at a temperature of 50°C for 20 minutes, add perfume (Ol. Rosae) then sift it using a 60 mesh, then dry it again in a drying cupboard at a temperature of 40°C for 20 minutes then sift it using a 100 mesh to get a finer powder. Then press it using an eye shadow printer and place it in an eye shadow container.

e. Test the Physical Properties of Eye Shadow

1. Organoleptic Test
   Organoleptic examination is carried out by physically observing the Eye Shadow preparation, including the shape, color, odor, texture of the Eye Shadow preparation.
2. pH Test
   This is done using pH paper dipped in 1 gram of eye shadow preparation which has been diluted in 10 ml of distilled water. Then observe the color changes that occur on the indicator paper and determine the pH value. A good pH value corresponds to the pH of human skin.
3. Homogeneity Test
   Homogeneity testing is carried out by visually observing the uniformity of the color of the powder mixture on the surface of the white paper. There should be no layers of color or imperfections in the color distribution (homogeneity) of eye shadow with natural ginger dye (Curcuma Xhantorrizha Roxb)
4. Iritation Test

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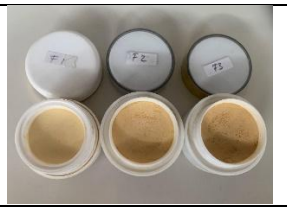
This irritation test aims to evaluate the skin's sensitivity to a preparation, which is carried out by volunteers for 15 minutes on the outside of the skin. Skin irritation is stated to occur if signs such as peeling of the skin or the appearance of itching on the skin.

5. Hedonic Test
   The preference test is a method used to assess the level of preference for a product or preparation using an assessment sheet. The number of 20 panelists is considered representative enough to carry out this test. This test includes the characteristics of the eye shadow preparation, namely color preferences, aroma preferences and texture preferences.

RESULTS AND DISCUSSION

The organoleptic test results of eye shadow preparations with natural coloring of ginger (Curcuma Xanthorrizha Roxb) have different colors caused by differences in concentration of the extract. The organoleptic test results for formula I, formula II and formula III are as follows:

Tabel 3 Organoleptic Test Results

Organoleptic Test	Formula I	Formula II	Formula III	Picture
Shape	Serbuk Padat	Serbuk Padat	Serbuk Padat	
Color	*Light Yellow*	*Palle Yellow*	*Cheese Yellow*	
Aroma	Ol.Rosae	Ol.Rosae	Ol.Rosae	
Texture	Smoothness	Smoothness	Smoothness	

Information :
F I: Basic formula with 20% ginger juice extract
F II: Basic formula with 30% ginger juice extract
F III: Basic formula with 40% ginger juice extract

Based on the pH test, it is known that the eye shadow preparation with natural coloring of ginger (Curcuma Xanthorrizha Roxb) in formula I has a pH of 7, while II and III have a pH of 6.5. From these three formulas, it can be concluded that the pH in formulas II and III is in accordance with the physiological pH of the skin, while the pH in formula I is not suitable due to differences in extract concentrations in ginger.

Tabel 4 pH Test Results

Replikasi	Picture	Formula I	Formula II	Formula III	Literatur
1		7	6,5	6,5	pH kulit 4,5 – 6,5 (Ii Carsita et al, 2015

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Replikasi	Picture	Formula I	Formula II	Formula III	Literatur
2		7	6,5	6,5	pH kulit 4,5 – 6,5 (Ii Carsita et al, 2015
3		7	6,5	6,5	pH kulit 4,5 – 6,5 (Ii Carsita et al, 2015

From the homogeneity test it can be concluded that the eye shadow preparation has been mixed homogeneously. This is demonstrated by an even mixture of eye shadow, a smooth and soft texture, and colors that are mixed evenly.

Tabel 5 Homogenity Test Results

Replikasi	Formula I	Formula II	Formula III	Picture
1	Homogen	Homogen	Homogen	
2	Homogen	Homogen	Homogen	
3	Homogen	Homogen	Homogen	

Based on the irritation test carried out, eye shadow preparations with ginger extract do not cause irritation or are safe to use.

Tabel 6 Irritation Test Results

Replikasi	Formula I	Formula II	Formula III	Picture
1	Does Not Cause Irritation	Does Not Cause Irritation	Does Not Cause Irritation	
2	Does Not Cause Irritation	Does Not Cause Irritation	Does Not Cause Irritation	
3	Does Not Cause Irritation	Does Not Cause Irritation	Does Not Cause Irritation	

The results of the preference test determined that color preference in formula I reached 35%, formula II 70%, and formula III 90%. Based on a preference test of 20 panelists, formula I, which is light yellow, is not much liked because the color is too pale, formula II in pale yellow is also rarely liked because the color is less striking, and formula III with cheese yellow is the most liked because it has the brightest color or the best color between formula I and formula

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II. For the aroma preference test, formula I reached 65%, formula II 60%, and formula III 70%. The explanation is that in terms of aroma, formula II has a distinctive ol.rosae fragrance which is more balanced without being too dominant, in contrast to formula I and formula II which have a stronger ol.rosae aroma. Meanwhile, in terms of texture, formula III has the best level of smoothness compared to formulas I and II.

Tabel 7 Hedonic Test

	Color Preference Test			Aroma Preference Test			Texture Preference Test		
	F I	F II	F III	F I	F II	F III	F I	F II	F III
LIKE	35%	70%	90%	65%	60%	75%	75%	70%	80%
DONT LIKE	65%	30%	10%	35%	40%	25%	25%	40%	20%

CONCLUSION

Curcuma extract can be used as a safe and effective natural coloring for eye shadow preparations, according to the results of physical properties tests which include organoleptic tests, pH tests, homogeneity tests, irritation tests and liking tests. The best eye shadow preparation formula with ginger extract is in formula III because it can be seen from the preference test, regarding color preference which reaches 90%, aroma preference 75%, and texture preference 80%. Formula III with a ginger extract concentration of 40% is the most preferred based on the preference test (Hedonic Test).

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