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# FORMULATION OF LOTION OF GERGA ORANGE PEEL ETHANOL EXTRACT WITH VARIATION OF EXTRACT CONCENTRATION

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## **Abstract**

Gerga Orange (*Citrus nobilis L. Var. RGL*) are the main commodity in Lebong Regency, Bengkulu Province. These oranges have been processed by the community into syrup preparations and from this activity produce waste in the form of fruit peels. Based on previous research, the peel of this citrus fruit is known to have antioxidant and antibacterial activity, so it can be used as a raw material in the manufacture of lotion preparations. The purpose of this study was to determine the characteristics of the three lotion formulations from the ethanolic extract of the gerga orange peel (*Citrus nobilis L. Var. RGL*) with various concentrations of 8% (F1), 10% (F2), 12% (F3). The method used is the experimental method. The results showed that the three formulations of lotion met the standard of good lotion. In the organoleptic test, there were differences in the color of the preparation, where the color became more concentrated as the concentration of the extract increased. In the homogeneity test, the three formulas showed good homogeneity until the 14th day of testing. The pH of the three formulas was also in accordance with the SNI 16-4399-1996 standard, namely 4.5-8. The three formulas also did not cause allergic reactions to 10 respondents. Based on the results of the research that has been done, it can be concluded that all formulas of the ethanol extract of the gerga orange peel (*Citrus nobilis L. Var. RGL*) with varying concentrations can be formulated as lotion preparations that are physically and organoleptically stable, as well as the standard of SNI 16-4399-1996 in terms of pH of the preparation and irritation test. Of the three formulas, formula 1 has an advantage over the other formulas because it has a less intense color, which makes it superior in appearance.

**Keywords** : Gerga Orange peel, extract ethanol, Lotion, Formulation

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## 1. Introduction

Cosmetics are substances or preparations intended for use on the external parts of the human body (epidermis, hair, nails, lips and external genital organs) or on the teeth and mucous membranes of the mouth, especially to clean, perfume, change appearance and or improve body odor or protect and maintain the body in good condition, one of which is lotion preparation (BPOM, 2019).

Lotion is a liquid preparation in the form of a suspension or dispersion. It can be in the form of a solid suspension in the form of a fine powder with a suitable suspending agent or an oil-in-water type emulsion with a suitable surfactant. The choice of lotion preparation is because it is an emulsion preparation that is easily washed with water and is not sticky compared to other topical preparations. In addition, the liquid form allows for fast and even application on the skin (Megantara et al., 2017).

Gerga Orange is one of the potential agricultural products in Bengkulu Province and is a leading commodity in Lebong Regency. Currently, apart from being sold in the form of fruit, this fruit is also used as a basic ingredient in making syrup. while the skin has not been used and is still a waste. Currently, the orange peel has not been used optimally and has the potential to be used as a basic ingredient for making lotion preparations because of the abundance and easy availability (Winni Fauziah & Mahrunisa, 2019).

Gerga orange peel contains flavonoid compound which have been scientifically proven to be efficacious as an antidote to free radicals (antioxidants) from sun exposure (Winni Fauziah & Mahrunisa, 2019). The orange peel also contains pectin and vitamin C, especially in the outer skin. Flavonoids have been scientifically proven to be efficacious as an antidote to free radicals (antioxidants) from sun exposure. Vitamin C has antioxidant activity that can fight free radicals which are one of the causes of skin damage (Wahyu Ariani & Wigati, 2016).

Similar research has been carried out by Helen Eliska Trianti Gurning, Adeanne C. Wullur and Widya Astuty Lolo in 2016, regarding variations in concentration of Lotion Formulations from Pineapple Peel Extract (*Ananas Comosus L.* (Merr)) with concentration variations of 8%, 10% and 12% indicated that the three concentrations in the study could be formulated as lotion preparations. Therefore, researchers are interested in making lotion preparations from extracts of gerga orange peel (*Citrus nobilis L.* Var. RGL) with the same concentration variations of 8%, 10% and 12% to prove that concentrations of 8%, 10% and 12% is an effective concentration and meets good requirements in the preparation of lotion of gerga orange peel extract (*Citrus nobilis L.* Var. RGL).

Based on the flavonoid and vitamin C contain which is has an antioxidant activity, researchers are interested in developing a lotion formulation from the ethanolic extract of the orange peel with variations in the concentration of the extract, namely 8%, 10% and 12%.

## 2. Materials and Methods

### Tools And Materials

The tools used in this research are laboratory glassware, Universal pH Paper, Analytical Scales, Hot Plate, Rotary Evaporator, Homogonizer and Lotion Container. The materials used in this study were Gerga Citrus Fruit Peel (*Citrus nobilis L.* Var. RGL), 70% Ethanol, Liquid Paraffin, Cetyl Alcohol, Stearic Acid, Glycerin, Methyl Paraben, Triethanolamine (TEA), Orange Essential Oil and Aquadest

### Making Simplicia Citrus Fruit Peel

The simplicia used in this study was gerga orange peel (*Citrus nobilis L.* Var. RGL). From 10 kg of gerga oranges, 1.5 kg of wet orange peels were obtained. The criteria for oranges taken are fresh, shiny yellowish green. then wet sorting is carried out to remove dirt, soil residue and other plant parts that are carried away, then the gerga oranges are

washed with running water, then separated between the flesh and skin, after that it is aerated at room temperature so it should not be exposed to sunlight. direct sunlight until simplicia is obtained with a water content below 10%. Perform dry sorting to ensure simplicia is free from dirt, after that the gerga orange peel is chopped to form coarse pieces.

#### The Process of Making Gerga Citrus Peel Ethanol Extract

The extraction method used is maceration. Simplicia was macerated with 70% ethanol for 3x3-5 days. The macerated extract was collected, and thickened using a rotary evaporator to obtain a thick extract (Fauziah et al., 2020).

#### Lotion Formulation of Gerga Orange Peel Extract Ethanol Extract

Lotion preparations were formulated with various extract concentrations (Table 1)

Table 1. Formula for Making Lotion Preparations from Ethanol Extract of Gerga Orange Peel (*Citrus nobilis* L. Var. RGL)

Ingredient	Concentration (%w/w)			Function	Standart (%)
	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>		
Gerga Citrus Fruit Peel Extract	8	10	12	Active substance	-
Stearic Acid	2,5	2,5	2,5	Emulsifier	1-20
Cetyl Alcohol	2	2	2	Emulsion Stabilizer	2-5
Liquid Paraffin	7	7	7	Moisturizer and Solvent	1-20
Glycerin	5	5	5	Moisturizer	≤30
Trietanolamine	2	2	2	Emulsifier	2-4
Methyl Paraben	0,05	0,05	0,05	Preservative	0,02-0,3
Essential Oil Orange	Qs	Qs	Qs	Fragrance	-
Aquadest	Ad 100	Ad 100	Ad 100	Solvent	-

#### Procedure :

##### 1) Massa 1 – Oil Phase

Cetyl alcohol, stearic acid, and liquid paraffin which is the oil phase are melted in a glass beaker on a hot plate at a temperature of 70°C and stirred homogeneously

##### 2) Massa 2 – aqueous Phase

The aqueous phase (TEA, glycerin, and aquadest) was heated in a glass beaker on a hot plate at 70°C and stirred homogeneously

##### 3) Then mix Massa 1 into the Massa 2 at a temperature of 70°C while stirring until the two phases are homogeneous.

##### 4) Then add methyl paraben, ethanol extract of gerga orange peel (in formulas 1, 2 and 3) and orange essential oil little by little while continuously stirring for about one minute until homogeneous and form a lotion (Rohmani & Anggraini, 2019).

### Evaluation Of Lotion

The lotion evaluation was carried out on days 1, 7 and 14, including organoleptic evaluation, homogeneity, pH and irritation test (Novi Yanty & Ade Siska, 2018).

1. Organoleptic evaluation

Organoleptic test was carried out to observe changes in the shape, color and smell of the ethanol extract of the gerga orange peel lotion visually on the 1st, 7th and 14th days

2. Homogeneity Test

0.1 gram of lotion is smeared on the watch glass, then touched and rubbed. The mass of the lotion must show a homogeneous composition, that is, no solid material is felt on the glass in formulas I, II and III. The homogeneity test was obtained until the entire lotion preparation was homogeneous with no grains or coarse particles on the slide

3. pH evaluation

The method of testing is by smearing each of the ethanol extract lotion formulations of gerga orange peel on universal pH paper and observing the color change on the pH paper.

4. Irritation Test

lotion is applied to the back of the hand for 3 hours and covered with a bandage. Then after 3 hours, the bandage was removed and the skin reaction was observed. If there is no irritation such as itching and redness, then the preparation is declared to meet the research requirements. This irritation test was conducted on 10 respondents.

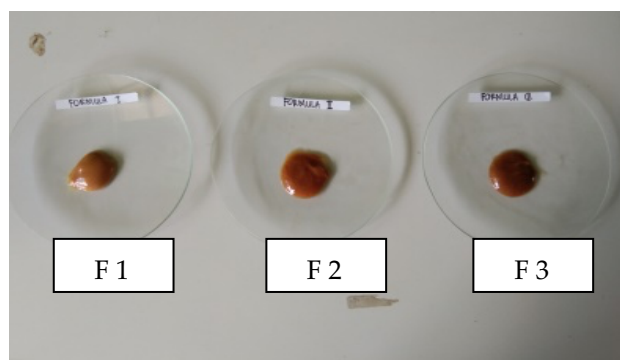
### 3. Results and Discussion

#### Organoleptic Test Results

Organoleptic test was carried out to observe changes in the shape, color and smell of the ethanol extract of the gerga orange peel lotion visually on the 1st, 7th and 14th days (Table 2). Organoleptic testing includes observing the color, odor and dosage form of lotion. The test results showed that there were no organoleptic changes in each formula from day 1 to day 14. In terms of smell, all three lotions have the same smell of orange. From the color observation, it can be seen that the third formula has a darker color than the other formulas. From these results indicate that the higher the concentration of the added extract, the more concentrated the color of the lotion. From the observation of the dosage forms, the three formulations had a lotion consistency and a soft texture when applied to the skin.

Table 2 Organoleptic Test Results for Lotion Preparations

Formula	Organoleptis	Observation of Lotion Preparations		
		Day-1	Day-7	Day-14
F1 (8%)	Form	Thick	Thick	Thick
	Colour	Brownish Yellow	Brownish Yellow	Brownish Yellow
	Scent	Typical Orange	Typical Orange	Typical Orange
F2 (10%)	Form	Thick	Thick	Thick
	Colour	Light brown	Light brown	Light brown
	Scent	Typical Orange	Typical Orange	Typical Orange
F3 (12%)	Form	Thick	Thick	Thick
	Colour	Dark brown	Dark brown	Dark brown
	Scent	Typical Orange	Typical Orange	Typical Orange



Picture 1. Lotion of Ethanol Extract of Ethanol Extract of Gerga Orange Peel (*Citrus nobilis* L. Var. RGL)

### Homogeneity Test Results

The homogeneity test aims to determine the level of mixing of the components of the lotion preparation (Eliska et al., 2016). From the test results of the three formulas on day 1, day 7 and day 14, it showed that all preparations were homogeneous, there were no visible coarse grains on the watch glass and no changes occurred during storage and testing. the addition of extracts did not affect the homogeneity of the preparations made (Table 3)

Table 3 Homogeneity Test Results

Formula	Observation of Lotion Preparations		
	Day-1	Day-7	Day-14
F1 (8%)	Homogeneous	Homogeneous	Homogeneous
F2 (10%)	Homogeneous	Homogeneous	Homogeneous
F3 (12%)	Homogeneous	Homogeneous	Homogeneous

### pH Test Results

The pH test was carried out to determine the pH value of the lotion with the pH of the skin. The pH value that can be accepted by the skin and in accordance with what is stipulated in SNI 16-4399-1996 is 4.5-8. Lotion preparations with a pH value that is too acidic can irritate the skin, while if the pH value is too alkaline it can make the skin dry and scaly (Eliska et al., 2016) The results of testing the pH of lotion preparations during storage for 14 days showed that the pH in the formulas F1, F2 and F3 met the requirements for a pH range that was acceptable to the skin (Table 4)

Table 4 pHTest Results

Formula	pH Observation of Lotion Preparations		
	Day-1	Day-7	Day-14
F1 (8%)	7	7	7
F2 (10%)	6	6	6
F3 (12%)	6	6	6

### Irritation Test Results

Irritation test is intended to determine whether the lotion causes irritation to the skin. The test was carried out on 10 different respondents who did not have a history of allergies, by applying a lotion preparation on the back of the hand for

3 hours and covered with a bandage and then observing the irritation reaction that occurred (Novi Yanty & Ade Siska, 2018). The test results showed that no respondents (0%) showed allergy symptoms such as redness, itching and roughness of the skin caused by applying lotion.

Table 5 Irritation Test Result

Formula	Irritation Observations on each Respondent									
	1	2	3	4	5	6	7	8	9	10
F1 (8%)	-	-	-	-	-	-	-	-	-	-
F2 (10%)	-	-	-	-	-	-	-	-	-	-
F3 (12%)	-	-	-	-	-	-	-	-	-	-

Information : + : Allergy symptoms were found during the test

- : No allergy symptoms were found during the test

#### 4. Conclusion

The ethanol extract of the gerga orange peel (*Citrus nobilis* L. Var. RGL) can be made into cosmetic preparations in the form of a lotion. Variations in concentration of jerguk gerga peel extract did not affect the physical properties of the lotion preparation itself. The three formulas, namely F1(8%), F2(10%) and F3(12%) were in accordance with SNI standard lotion in terms of pH, homogeneity and irritation. The three formulas did not show good stability until day 14. Of the three formulas, the first formula had advantages in terms of organoleptic, because the color of the preparation was not so concentrated.

#### 5. Suggestion

All formulas (F1, F2 and F3) have met SNI standards and have good cream preparation characteristics. However, in terms of the aesthetics of the preparation, the appearance of the cream is still unattractive. Therefore, further research is still needed so that the color of the preparation becomes more attractive.

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