FORMULATION OF FORM GEL PEEL OFF MASK FROM ETHANOL EXTRACT OF HIBISCUS ROSA-SINENSIS L. LEAVES

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ABSTRACT

Cosmetics made from synthetic materials can cause side effects and damage the natural shape of the skin. One of the cosmetics that can repair, care for facial skin, cleanse and moisturize the skin is a peel-off gel face mask. Hibiscus leaves have the potential to be antibacterial containing flavonoids, saponins and polyphenols. This study aims to determine the optimal formulation of a peel-off gel mask preparation of ethanol extract of Hibiscus leaves (Hibiscus rosa-sinensis L) with concentrations of 40%, 60% and 80%. The method used is the Experimental method. The results of the evaluation test of the physical properties of the peel-off gel mask preparation showed that all formulas met the requirements for a good peel-off gel mask. Analysis of research data with one way ANOVA produced a pH test sig. 0.168> 0.05, a spread power test sig. 0.392> 0.05 showed no significant difference in each formula group while in the adhesion test sig. 0.000 < 0.05, drying time test 0.008 < 0.05, viscosity test 0.010 < 0.05 showed significant differences in each formula group. The peel-off gel mask formula of hibiscus leaf ethanol extract (Hibiscus rosa-sinensis L) which has the most optimal physical properties of the preparation is a formula with a concentration of 80%.

Keywords: *Formulation, Hibiscus rosa-sinensis L, Leaves, Characteristics, Peel off Gel Mask*

INTRODUCTION

The use of a peel-off gel face mask is useful for repairing and treating facial skin from wrinkles, aging, acne and can also be used to shrink pores. In addition, peel-off gel masks can also be used to cleanse and moisturize the skin. Making cosmetics from natural ingredients is better than synthetic ingredients. Synthetic ingredients can cause side effects and can even damage the natural shape of the skin (Sulastri & Yohana Chaerunisaa, 2016)The peel-off gel mask formula used contains several types of ingredients including gelling agents, humectants, preservatives, flavorings and solvents (Tanjung et al., 2021).

The hibiscus plant (*Hibiscus rosa-sinensis* L.) is a shrub of the Malvaceae family originating from East Asia and is widely planted as an ornamental plant in tropical and subtropical areas. According to previous research, ethanol extract of hibiscus leaves contains antibacterial properties, namely flavonoids, polyphenols, and saponins (Yusuf & Mourisa, 2020).

According to previous research, it showed that hibiscus leaf extract (*Hibiscus Rosa-Sinensis* L.) at concentrations of 40%, 60%, and 80% has the ability to inhibit P. Acnes bacteria. At a concentration of 80% of hibiscus leaf extract, it is most effective in inhibiting the growth of P. Acnes bacteria compared to concentrations of 40% and 60% (Yusuf & Mourisa, 2020). Based on the description above, the researcher is interested in making a peel-off gel mask formulation of ethanol extract of *Hibiscus rosa-sinensis* L. leaves with concentrations of 40%, 60%, and 80%. This study also conducted a characteristic test on the peel-off gel mask preparation in order to produce a good peel-off gel mask preparation.

METHODE

Tools are blender, jar, digital scale, stirring rod, measuring cup, filter paper, pH paper, pipette, cup, enlemeyer, ruler, aluminum foil, container. Materials are ethanol extract of hibiscus leaves, 96% ethanol, polyvinyl alcohol (PVA), hydroxypropyl methylcellulose (HPMC), propylene glycol, distilled water, methylparaben and propylparaben.

Preparation of Simplisia

Hibiscus leaves (*Hibiscus rosa-sinensis* Linn) were obtained from Angsana sub-district, Tanah Bumbu Regency. The harvested Hibiscus leaves were then sorted, then washed, then dried under the sun covered with a black cloth until dry. After drying, it was powdered.

Making Ethanol Extract of Hibiscus Leaves

The extraction process was carried out using the maceration method, a total of 1,500 grams of powdered Hibiscus leaves were soaked using 15 liters of 96% ethanol solvent for 24 hours while occasionally shaking and re-maceration was carried out using the same amount of solvent. Then the macerate was filtered and the filtrate was obtained.

Table 1. Formulation of Gel Peel off Mask

Formula	F0	F1	F2	F3
Hibiscus leaf extract	-	40	60	80
PVA	12	12	12	12
HPMC	2	2	2	2
Propylene glycol	10	10	10	10
Nipagin	0,2	0,2	0,2	0,2
Nipasol	0,05	0,05	0,05	0,05
Aquadest ad	100	100	100	100

Preparation of Peel Off Gel Mask Preparation with Ethanol Extract of Hibiscus Leaves

Add hibiscus leaf extract after dissolving methylparaben and propylparaben in ad-soluble propylene glycol (Container A). PVA is made in a separate container using hot water at a temperature of 80°C until it expands perfectly on a water bath while stirring and homogenizing (container B). Furthermore, until it expands, HPMC is made with distilled water in a different container (container C). After that, combine container B and container A in container C one by one while stirring until homogeneous. If it is homogeneous, add 100 ml of distilled water. Add hibiscus leaf extract each with a concentration of 40%, 60%, and 80%, put it into the mask base, stir until homogeneous.

Physical Evaluation of Hibiscus Leaf Ethanol Extract Peel Off Gel Mask

Organoleptic Test

Observation is done directly by observing the color, odor, and shape of the Hibiscus leaf ethanol extract peel off gel mask preparation (Andika Saputra et al., 2019).

Homogeneity Test

Homogeneity testing is done by taking 1 gram of peel off gel mask sample on a glass object. The preparation is said to be homogeneous if there is a similarity in color and there are no visible coarse grains that can be felt in the preparation (Putri et al., 2021).

pH Test

The pH measurement is done by dipping pH meter paper into the hibiscus leaf ethanol extract peel off gel mask preparation. The pH of the peel off gel mask preparation must be in accordance with the skin pH, which is 4.5–6.5 (Rosaini et al., 2019).

Spreadability Test

A total of 1 gram of peel off gel mask is carefully placed on the glass. Next, it is covered with another glass that is weighted on top until the weight reaches 150 g and the diameter is measured after 1 minute. The spreadability requirement is

5-7 cm

Drying Ability Test

A total of 1 gram of peel-off gel mask is applied to the surface of the skin of the hand. Then the drying speed of the peel-off gel mask is calculated to form a film layer of the peel-off gel mask using a stopwatch

Adhesion Test

The adhesion test is carried out by applying gel to one of the object glasses and covering it with another object glass, then giving a load of 250 grams for 5 minutes. After that, the object glass is placed on the adhesion tool and a load weighing 50 grams is released, the time is recorded until the object glass is released. Good adhesion is more than 10 seconds

Viscosity Test

The viscosity of the peel-off gel mask sample was measured with a Rotary Viscometer using spindle No. 4, then set the speed to 12 rpm and time 25 seconds

Irritation Test

The test was carried out by applying it to human skin. Take a small amount of the peel-off gel mask preparation, then apply it to the inner arm, observe the symptoms that arise such as redness and itching on the skin. This irritation test was carried out on 10 volunteers (Setiawan et al., 2021).

Data Analysis

Data were analyzed statistically using One Way Anova. If the normality value produces a significant

<0.05, the data is not normally distributed, the Kruskal-Wallis test is performed. Then if the normality value produces a significant >0.05, the data is normally distributed, the Post-Hoc LSD test is performed.

RESULTS AND DISCUSSION

Obtained 550.14 grams of thick extract with a yield of 36.676%. The yield obtained meets the established quality standards. Evaluation of Peel Off Gel Mask Preparation with Hibiscus Leaf Ethanol Extract

Organoleptic Test

Organoleptic test is a test carried out using human senses to observe changes in the shape, odor and texture of the peel off gel mask preparation with hibiscus leaf ethanol extract Organoleptic testing of the peel off gel mask preparation was thick, odorless and light brown in color. The condition remained stable for 28 days and did not change.

Homogeneity in a preparation indicates that the peel-off gel mask ingredients have been mixed to eliminate coarse grains and to detect changes. Homogeneity also affects the effectiveness of the active substances contained in the preparation. Homogeneity testing of the peel-off gel mask preparation was carried out for 28 days. The preparation remained homogeneous until the 28th day.

The pH test aims to determine the acid and base levels of the peel-off gel mask preparation and also to see the safety of the preparation so that it does not irritate the skin when used. The pH value of the preparation must be in accordance with the skin's pH value, which is in the range of 4.5-6.5. If the preparation's pH is too acidic or less than 4.5, it will irritate the skin, while too alkaline or more than 6.5 will produce scaly skin. The pH test of the peel-off gel mask preparation was carried out for 28 days. The results of the pH test can be seen in Table 2.

The spreadability test of the peel-off gel mask preparation is intended to determine the ability of the peel-off gel mask to spread when applied to the skin. Good spreadability is between 5-7 cm. The easier it is to apply, the more optimal the absorption of active substances into the skin. The spreadability test of the peel-off gel mask preparation was carried out for 28 days. The results of the spreadability test can be seen in Table 3.

Table 2: Results of observations of pH tests of peel-off gel mask preparations

Formula	Day				
	0	**7**	**14**	**21**	**28**
F0 (Basis)	5,66	5,66	5,66	5,66	5,66
F1 (40%)	5,33	5,33	5,33	5,33	5,33
F2 (60%)	5,33	5,33	5,33	5,33	5,33
F3 (80%)	5,33	5,33	5,33	5,33	5,33

Table 3. Results of observations of the spreadability test of the peel-off gel mask preparation

Formula	Days				
	0	7	14	21	28
F0 (Basis)	5,7 cm	5,8 cm	5,8 cm	5,6 cm	5,7 cm
F1 (40%)	5,5 cm	5,7 cm	5,9 cm	5,4 cm	5,6 cm
F2 (60%)	5,4 cm	5,4 cm	5,6 cm	5,5 cm	5,5 cm

Table 4. Results of observations of the adhesive power test of the peel-off gel mask preparation

Formula	Days (Second				
	0	7	14	21	28
F0 (Basis)	23,49	21,20	32,61	33,63	37,11
F1 (40%)	39,06	50,21	51,40	53,15	56,60
F2 (60%)	33,11	35,98	34,47	37,68	40,18
F3 (80%)	57,45	58,01	60,48	63,15	63,19

Table 5. Results of observations of the drying time test of the peel-off gel mask preparation

Formula	Days (Minute)				
	0	7	14	21	28
F0 (Basis)	26,54	22,93	19,63	20,02	16,55
F1 (40%)	22,26	20,63	20,39	18,74	17,51
F2 (60%)	22,50	20,28	20,47	19,39	17,62
F3 (80%)	19,05	18,93	17,04	17,18	16,41

Table 6. Observation results of the viscosity test of the peel-off gel mask preparation

Formula	Days (mPa-s)				
	0	7	14	21	28
F0 (Basis)	20.816	24.233	25.950	30.233	31.716
F1 (40%)	33.650	35.566	36.200	36.616	38.200
F2 (60%)	32.866	33.466	34.166	35.333	36.350
F3 (80%)	32.200	32.816	32.949	33.150	33.833

The spreadability tests conducted on the four peel-off gel mask preparations yielded varying results. This effect is influenced by the different concentrations of active substances (Syamsidi et al., 2021). Based on the spreadability requirements for peel-off gel mask preparations, which are around 5–7 cm, the hibiscus leaf ethanol extract peel-off gel mask preparation has met the requirements for good spreadability.

The adhesion test was conducted to determine the ability of the mask to adhere when applied and distribute active substances to the skin during the process until it dries. Good adhesion of peel-off gel is that it has an adhesion of more than 10 seconds (Agustina et al., 2023). The greater the adhesion produced, the greater the diffusion of active substances on the skin because the bond that occurs between the preparation and the skin is longer. We conducted an adhesion test on the peel-off gel mask preparation over a period of 28 days. The adhesion test on the 4 peel-off gel mask preparations produced preparations that met the requirements, and the 80% concentration preparation had the highest adhesion.

The drying time speed test in the peel-off gel mask preparation aims to determine the speed of the mask forming a film on the skin so that it is easy to peel off when applied (Riskita et al., 2023). The drying time test of the peel-off gel mask preparation was carried out for 28 days. The drying time test of the preparation with a concentration of 80% dries faster than other preparations. Preparations with concentrations of 40% and 60% still meet the drying time test requirement for the peel-off gel mask formula, which is 15-30 minutes.

The purpose of viscosity testing is to determine the concentration of a preparation. Measurement of the viscosity of the preparation was carried out using a Rotary Viscometer spindle No. 4, a duration of 20 seconds at a speed of 12 rpm, a good viscosity value for gel preparations is 3,000-50,000 mPa-s (Barnes, 2001). Viscosity testing of the peel-off gel mask preparation was carried out for 28 days. Based on table 8 above, the viscosity testing of the 4 preparations meets the requirements for good viscosity, namely 3,000-50,000 mPa-

s.

The irritation test was conducted to determine whether the peel-off gel mask preparation caused skin irritation or not. This test was conducted on 10 volunteers. A positive irritation reaction was indicated by the appearance of redness, itching, or swelling on the surface of the skin of the treated hand. The irritation test of the peel-off gel mask preparation was conducted for 28 days. Irritation testing of 10 respondents who applied it to the inner arm and left for 24 hours showed that the preparations of the four peel-off gel masks with hibiscus leaf ethanol extract did not cause signs of irritation such as redness of the skin, itching, or swelling.

CONCLUSION

The results of the physical evaluation of the peel-off gel mask preparation with ethanol extract of hibiscus leaves (*Hibiscus rosasinensis* L.) including organoleptic test, homogeneity test, pH test, spreadability test, adhesion test, drying time test, viscosity test, irritation test gave good results and the most optimal peel-off gel mask preparation with ethanol extract of hibiscus leaves was the preparation with a concentration of 80%.

ACKNOWLEDGEMENTS

The researcher would like to thank Stikes Darul Azhar Batulicin.

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