

Formulation And Evaluation Of Peel-off Gel Mask Moringa Leaves Extract (*Moringa oleifera Lam*)

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ABSTRACT

Peel-off gel mask is a practical mask, after drying the mask can be directly removed or removed without causing pain. This mask can also restore freshness and softness of the skin, even with regular use it can reduce fine wrinkles on facial skin. Moringa plants contain antioxidants, especially the leaves that contain flavonoids, causing Moringa leaves to be used as a source of natural antioxidants. The research method used is an experimental method with peel off gel mask preparation samples of Moringa leaf extract with various concentrations of 0% (F0), 5%(F1), 10%(F2), and 15% (F3). Data analysis using One Way Anova test with 95% confidence level of significance = 0.05. Evaluation of the peel off gel mask preparation includes organoleptic test, homogeneity test, pH test, viscosity test, dispersibility test, adhesion test, dry time test and syneresis test. The results of the research F0, F1, F2 and F3 met the standard of the tests carried out such as organoleptic tests, pH tests, dispersibility tests, adhesion tests, dry time tests, and syneresis tests. The results of the One Way Anova statistical test for the pH test obtained a P-Value value of 0.63 > 0.05, the dispersion test obtained a P-Value value of 0.02 > 0.05, the drying time test obtained a P-Value value of 0.00 < (0.05) while the test dispersion and syneresis test there is an effect of giving concentration variations with a significance value of $P < (0.05)$.

Keywords : Moringa leaf, antioxidant, peel-off gel mask

INTRODUCTION

Medicinal plants have been used since time immemorial before the discovery of chemical drugs. Medicinal plants have good safety and do not cause side effects when consumed. Indonesia has a diversity of medicinal plants that can be used in medicine such as Moringa leaves, this plant is one of the plants that has medicinal properties (Ainaro et al., 2015). high in treatment. This plant has been known for its efficacy based on community experience.

Moringa is easy to find in Indonesia. Very affordable. Moringa plants have benefits such as being an antioxidant, based on previous research Moringa leaves contain high vitamin C. including Vitamin A, calcium, potassium, iron, flavonoids, Phenols, carotenoids, hydroxynamic acid derivatives and flavonoids cause Moringa leaves to be used as a source of natural antioxidants (Sugihartini & Nuryanti, 2017).

Substances contained in Moringa leaves can be used in the cosmetic field for skin care. The high content of vitamin E from Moringa can help regenerate dead skin cells, so that facial skin looks brighter and delays premature aging of the skin. this preparation is a product that does not use hazardous chemicals(Chumark et al., 2008). So that it can created into a product that if marketed the price is not expensive and comparable with other face masks that can be reached by various age groups. Moringa leaves contain vitamin B2, so they can keep the skin moist. The skin is an organ that functions to protect and form the surface of the body. The skin can have a dull and wrinkled appearance, look old and wrinkled and black spots appear. This is caused by various factors, both internal and external, one of the factors outside the body, such as exposure to sunlight which can damage the skin (Rahmawanty et al., 2015). Peel off gel mask as a cosmetic that functions for facial care. Gel preparations after being applied to the skin for a certain period of time can dry and form a transparent and elastic film layer, so that it is easily lifted and removed. Some of the benefits of peel-off facial masks are that they can maintain youthfulness of the skin, soften it, increase skin elasticity, can remove dead skin cells and remove dull skin. Use of peel-off facial masks It is very easy to use because it does not cause pain and gels quickly (Karmilah & Rusli, 2018).

TOOLS AND MATERIALS

The tools used include: analytical balance, 100 ml, 200 ml beaker glass, test tube, steaming pan, measuring cup, volumetric flask, syringe.

The materials used in this study were moringa leaf extract, polyvinyl Alcohol, HPMC, glycerin, TEA, methyl paraben, and aquadest.

METHOD

Research procedure

1. Preparation of Moringa Leaf Simplicia (Moringa oleifera Lam)

The sample used in this study was Moringa leaves (Moringa oleifera Lam) which is obtained from e-commerce which has become the simplicia powder of Moringa leaves as much as 1 kg.

Preparation of Ethanol Extract of Moringa Leaves (Moringa oleifera Lam)

Extract from Moringa leaves (Moringa Oleifera Lam) was carried out in the Phytochemical Laboratory STIKes Muhammadiyah Ciamis. Yield is done to see the extract. The extract was carried out by maceration method. The simplicia that has been prepared is put into a glass jar and then soaked in water 96% ethanol for 3 x 24 hours while stirring occasionally in order to withdraw the active substance maximally. Storage is carried out at room temperature to avoid direct contact with sunshine. After immersion, stirring is then carried out on the sample and then carried out filtering process using filter paper.

2. Phytochemical Screening

Ethanol Extract of Moringa Leaves (Moringa oleifera Lam) Phytochemical screening is one way that can be done to identify the content of secondary metabolites of a natural product. In this study, a qualitative screening of phytomia was carried out. This is done through a color reaction using a certain reagent in hot aquadest until it forms like a gel. After it is formed, add 2 grams of Triethanolamine (TEA) to each formulation. Dissolve glycerin and methyl paraben into hot water then after dissolved mix it in each formulation Then add the Moringa leaf extract which was previously dissolved in ethanol little by little stir until

homogeneous until the color is even. Furthermore, the preparation is put into the gel pot for further evaluation of the gel.

3. Formulation

Moringa leaf extract (*Moringa oleifera* lam) is formulated in the form of a gel with various ingredients HPMC concentration variations as a basis. Preparation of Moringa leaf extract gel (*Moringa oleifera* lam) namely by developing HPMC as a gelling agent according to the concentration each formulation. In formulation 1 the development of HPMC is 5 grams for formulation 2 as much as 10 grams and for formulation 3 as much as 15 grams and for negative control (Sugihartini & Nuryanti, 2017). Without using HPMC is done with 3 repetitions in each formula. Step first in the cup enter the polyvinyl alcohol then add 10 ml of aquadest then heated over a water bath with a temperature of 70°C until it expands perfectly until it is like shaped like gel grains, then HPMC was also developed in other dishes in hot distilled water until it forms like a gel. Once formed then input Triethanolamine (TEA) in each formulation as much as 2 grams. Dissolve glycerin and methyl paraben into hot water then after dissolved mix it in each formulation. Then Enter the Moringa leaf extract which was previously dissolved in ethanol little by little then stir until homogeneous until the color is even. Next, the preparation is put into the pot gel for further evaluation of the gel (Hardiyanti Febby, 2015).

4. Evaluation of Preparations

Evaluation test of Moringa leaf extract peel off gel mask preparation included organoleptic, homogeneity, adhesion, spreadability, viscosity, pH, dry time, and stability test. Organoleptic testing is done visually by looking at the shape, smell and color preparations. Homogeneity testing was carried out visually using an object glass to see the presence or absence of coarse grains in the preparation. Viscosity testing was carried out using a Brockfield viscometer. The adhesive power test is carried out using the adhesive power test. Spreadability testing is carried out using a diameter glass. The pH test was carried out using a universal pH. For dry time testing using a stopwatch (time). The syneresis test was carried out visually by calculating by measuring the weight loss during storage and then compared with the initial weight of the gel (Speth, 2017).

RESULT

1. Extraction of moringa leaf.

The filtrate obtained is then evaporated on a water bath at 70°C. The extract yield obtained from 1000 grams of simplicia powder is 8 grams. According to the Herbal Pharmacopoeia, a good yield value should not be less than 7.5%.

In this study, a yield value of 8% was obtained so that the yield of Moringa leaf extract was in accordance with the provisions, the more extract yield, the more extract obtained.

$$\% \text{ Extract} = \frac{\text{weight of ekstrak (g)}}{\text{sample weight (g)}} \times 100\%$$

$$\% \text{ Extract} = \frac{80 \text{ gram}}{1.000 \text{ gram}} \times 100\%$$

$$\% \text{ Extract} = 8 \%$$

Extract results obtained 8 gram from 1000 grams of powder Simplisia. According to the Herbal Pharmacopoeia, a good yield value should not be less than 7.5%. In this study, a yield value of 8% was obtained so that the yield of Moringa leaf extract was in accordance with the provisions, the more extract yield, the more extract obtained.

2. Phytochemical screening

Table 1. The result Phytochemical screening moringa leaf extract

Phytochemical test	reagent	result	Conclusion
Flavonoid	HCl	Orange	Positif
Saponin	H2O	Foam more than 5 minutes	Positif

3. Organoleptic test

The organoleptic examination of the gel was carried out visually including the color, smell and texture of the preparation.

Table 2. The result of organoleptic test gel peel off moringa extract

Organoleptic test	F0	F1	F2	F3
Color	Green	Dark green	Yellowish green	Yellowish green
Smell	Extract odor	Extract odor	Extract odor	Extract odor
texture	Viscous	Viscous	Viscous	Viscous

4. Homogeneity test

Table 3. The result of homogeneity test gel peel off moringa extract

Formulation	Replication 1	Replication 2	Replication 3
F0	Homogeneous	Homogeneous	Homogeneous
F1	Homogeneous	Homogeneous	Homogeneous
F2	Homogeneous	Homogeneous	Homogeneous
F3	Homogeneous	Homogeneous	Homogeneous

5. pH test

Table 4. The result of pH test gel peel off moringa extract

Formulation	Replication 1	Replication 2	Replication 3	mean
F0	5,4	5,6	5,8	5,6
F1	5,5	5,7	5,8	5,7
F2	5,6	5,7	5,8	5,7
F3	5,6	5,8	5,9	5,8

6. Viscosity test

Table 5. The result of viscosity test gel peel off moringa extract

Formulation	Replication 1 (cps)	Replication 2 (cps)	Replication 3 (cps)	Mean (cps)
F0	2110	2250	2560	2307
F1	2160	3040	3880	3027
F2	2373	3000	3863	3079
F3	2360	3500	3650	3170
Standard	2000-4000			

7. Spreadability test

Table 6. The result of spreadability test gel peel off moringa extract

Formulation	Replication 1 (cm)	Replication 2 (cm)	Replication 3 (cm)	Mean (cm)
F0	5,5	5,5	5,7	5,6
F1	5,8	5,7	5,7	5,8
F2	6,0	6,1	6,0	6,0
F3	6,5	6,5	6,8	6,5
Standard	5-7 cm			

8. Adhesion test

Table 7. The result of adhesion test gel peel off moringa extract

Formulation	Replication 1 (second)	Replication 2 (second)	Replication 3 (second)	Mean (second)
F0	6,10	6,17	6,35	6,20
F1	6,17	6,43	7,19	7,00
F2	7,19	7,45	7,17	7,27
F3	7,16	8,52	9,16	8,28

9. Dry time test

Table 8. The result of dry time test gel peel off moringa extract

Formulation	Replication 1 (minute)	Replication 2 (minute)	Replication 3 (minute)	Mean (minute)
F0	15,,30	16,25	17,10	16,21
F1	16,20	16,00	17,25	16,48
F2	18,30	19,17	20,40	19,29
F3	20,10	21,15	22,10	21,11

10. Syneresis test

Table 9. The result of syneresis test gel peel off moringa extract

Formulation	Before	After
F0	-	-
F1	-	-
F2	-	-
F3	-	-

DISCUSSION

1. Extraction of moringa leaves.

Extract results obtained 8 gram from 1000 grams of powder Simplisia. According to the Herbal Pharmacopoeia, a good yield value should not be less than 7.5%. In this study, a yield value of 8% was obtained so that the yield of Moringa leaf extract was in accordance with the provisions, the more extract yield, the more extract obtained .

2. Phytochemical screening

Based on the phytomia screening results table, it shows that Moringa Oliefera Lam leaf extract contains flavonoids where the results are positive with a marked change in color to

orange. This happens because flavonoids are included in phenolic compounds. When phenol is reacted with acid, a color is formed due to the conjugation system of the aromatic group. On the identification of saponins of Moringa leaf extract (*Moringa Oleifera* Lam). The results showed positive for containing saponins this was indicated by the formation of foam and lasted for more than 5 minutes. The appearance of foam in this test indicates its presence glycosides which have the ability to form foam in water (Palada & Chang, 2003).

3. Organoleptic test

The results of the organoleptic test showed that the gel mask preparation Formula F0 had a distinctive odor and green in color due to the addition of dye from the extract. The F1 formula has a distinctive odor and dark green in color, for F2, F3 the aroma is distinctive and yellowish green in color. Because The more extracts added, the darker the color of the resulting preparation.

From the results of observing the dosage form, it was found that the gel mask preparation was peel off which is made has a fairly good shape and is consistent with marked fixed dosage forms soft like gel, homogeneous and no separation or precipitation occurs. Shape consistent for 30 days of storage at room temperature (Rafanisa Apriansah et al., 2022). For the preparation of gel formula masks F0 has a viscous form but is not like a gel because it does not use the HPMC concentration, and for thick F1, F2, F3 formulas like gel masks because the concentration of HPMC is different. The more The more concentrations of HPMC, the thicker the preparation will be. The color of the preparations for each formulation is different because each has a concentration The different HPMC namely; controls, 5%, 10%, 15%. At a concentration of 0% the color produced green, the concentration of 5% the resulting color is dark green, the concentration of 10% yellowish green, and a concentration of 15% light green. The results obtained are that the preparation of masks the gel does not experience a change in physical color or the color produced during the gel mask smeared. While the aroma produced from all gel mask preparations is the distinctive aroma of leaves moringa In room temperature storage for 4 weeks Moringa leaf extract used in gel mask preparations are still stable and do not change color.

4. Homogeneity test

Homogeneity check aims to see whether the materials used in the manufacture have been mixed evenly. Checking the homogeneity of the preparation was carried out by placing the gel mask preparation on an appropriate glass object and then closing it, after which it was observed. Having observed shows that all gel mask preparations that have been made do not show any particles or coarse grains. This shows that the preparations made have a homogeneous composition. Homogeneity test results for homogeneous F0 no particles in each replication, homogeneous F1 no particles in each replication, homogeneous F2 no particles in each replication, and homogeneous F3 no particles in each replication (Lailiyah et al., 2021).

5. pH test

From the results of measuring the pH of the peel-off gel mask of Moringa leaf extract, it can be seen that the results obtained can be concluded that the 4 formulations fall within the pH range of the skin, namely are in the range of 4.5 – 6.5. In the F0 formula used as a control in replication I has a pH of 5.4, replication II 5.6, replication III 5.8 with an average of 5.6. On the F1 formula with HPMC concentration of 5% on replication has a pH of 5.5, replication II 5.7, replication III 5.8 with average 5.7. In formula F2 with a concentration of 10% in replication I 5.6, replication II 5.7, replication III 5.8 with an average of 5.7. In the F3 formula on replication 1 has a pH of 5.6, replication II 5.8, replication III 5.9. With an average of 5.8. The pH value has the same pH with the pH of the skin because if the peel off gel mask has a pH that is too alkaline then it can causes the skin to become dry, whereas if the peel off gel mask has a pH that is too acidic it can cause irritation to the skin.

6. Viscosity test

Results of the viscosity test F0, replication I 2110 mpa.s, replication II 2250 mpa.s, replication III 2560 mpa.s, with an average of 2307 mpa.s. These results are in accordance with the standard 2000-4000 cps. F1 on replication I 2160 mpa.s, replication II 3040 mpa.s replication III 3880 mpa.s, with an average of 3027 mpa. s. These results are in accordance with the standard 2000-4000 cps. F2 on replication I 2373 mpa.s, on replication II 3000 mpa.s, replication III 3863 mpa.s with an average of 3079 mpa.s, these results are in accordance with standard 2000-4000 cps. F3 on replication I 2360 mpa.s, replication II 3500 mpa.s, replication

III 3650 mpa.s with an average of 3170 mpa.s, these results are in accordance with the standard 2000-4000 cps. In the table data for viscosity test measurements with Rotor Value 2 peel off gel masks can be looking at the results obtained, it can be concluded that the results of the peel-off gel mask viscosity test Moringa leaf extract (*Moringa oleifera* lam) complies with skin viscosity test standards so that the preparation is thick like a gel so that it can spread properly if applied to the skin. However, if the preparation has a poor viscosity test, then the substance active on the preparation does not spread properly and if there is an increase in viscosity on during storage, causing a decrease in viscosity.

7. Spreadability test

The results of the F0 spreadability test on replication I was 5.5 cm, replication II was 5.5 cm, replication III was 5.7 cm, and has an average of 5.6 cm. This result is in accordance with the standard because it meets the requirements in the range of 5-7 cm. F1 on replication I 5.8 cm, replication II 5.7 cm, replication III 5.7 cm, with average 5.8 cm. This result is in accordance with the standard because it meets the requirements in the range 5-7 cm. F2 in replication I was 6.0 cm, replication II was 6.1 cm, replication III was 6.0 cm, with an average of 6.0 cm. This result is in accordance with the standard because it meets the requirements in the range of 5-7 cm. F3 on replication I 6.2 cm, replication II 6.5 cm, replication III 6.8 cm, with an average of 6.5 cm. on data Table of measurement of spreadability test with a load of 50 grams of peel off gel mask can be seen the results From the results obtained, it can be concluded that the results of the spreadability test of the leaf extract peel-off gel mask Moringa (*Moringa oleifera* lam) is good because it complies with the skin spreadability test standards so preparations can be applied more easily and are able to reach all part of the skin, so that the active substance is perfectly distributed and the therapeutic effect is achieved. However if the preparation has poor spreading power, the active substance cannot be distributed incomplete and the therapeutic effect is not achieved.

8. Adhesion test

In the stickiness test F0 as a control, in replication I it has 6.10 sec, replication II 6.17 sec, replication III 6.35 with an average of 6.20. F1 with 5% HPMC on replication I 6.17 sec, replication II 6.43 seconds, replication III 7.19 seconds with an average of 7.00 seconds. F2 with

HPMC 10% on replication I 7.19 seconds, replication II 7.45 seconds, replication III 7.17 seconds with an average of 7.27. F3 with HPMC 15% in replication I 7.16 seconds, replication II 8.52 seconds, replication III 9.16 seconds with an average 8.28 sec. In the data table for the measurement of adhesion test with a load of 500 grams of peel off gel mask it can be seen from the results obtained, it can be concluded that the results of the gel mask adhesion test peel off Moringa leaf extract (*Moringa oleifera* lam) with a range of 6-13 seconds because of the active substance well absorbed. The longer the preparation is attached to the skin, the greater the therapeutic effect given by the preparation will be more optimal, because the active substance will be absorbed perfectly. However if the preparation has poor adhesion, the active substance cannot be absorbed incomplete and the therapeutic effect is not achieved.

9. Dry time test

The dry time test aims to find out how long it takes for the preparation of dry peel off gel masks. Drying of the preparation is carried out at room temperature 28°C with the preparation of a gel mask rubbed on the skin area of the hand and then measured using stopwatch. The results of the dry time test showed the results of F0 at replication I 15.30 minutes, replication II 16.25 minutes, replication III 17.10 minutes, with an average of 16.21 minutes. F1 on replication I 16.20 min, replication II 16.00 minutes, replication III 17.25 minutes, with an average of 16.48 minutes. On F2 on replication I 18.30 min, replication II 19.17 min, replication III 20.40 min with an average showed results 19.29 min, F3 on replication I 20.10 min, replication II 21.15 min, replication III 21.10 min with an average yield of 21.11 min. The higher the HPMC gel base concentration, the the drying time increases (Annisa, 2018). The average length of drying time of preparations the peel off gel masks that were tested were between 16.21-21.11 minutes. In the data table for the drying time of the peel-off gel mask, the results obtained can be seen it can be concluded that the results of the dry time test of the peel-off gel mask of Moringa leaf extract (*moringa oleifera* lam) is good because it is in the appropriate time range standard so that the preparation can dry properly when applied to the skin. That matter because the 4 formulations are included in the drying time test standard, namely the time standard preparation dries 15-30 minutes.

10. Syneresis test

The syneresis test was carried out to see the stability of the gel preparation to see what happened syneresis or not syneresis is done by observing the presence of water spots on surface of gel preparations before and after treatment. Syneresis that occurs during Storage was observed by storing the gel at $\pm 10^{\circ}\text{C}$ for 24, 48, and 72 hours. The results of the syneresis test which were tested for 3 days showed that the formula being tested did not experience syneresis during storage even though it was still below 10%. But seen directly indicates the existence of separation of the two phases in the test preparation (Popescu et al., 2020).

CONCLUSION

Moringa leaves extract (*Moringa Oleifera* Lam) with various concentrations of triethanolamine can be made into a Peel Off Gel Mask. The peel off gel mask of Moringa leaf extract in all formulations met the test standards carried out such as organoleptic test, pH test, spreadability test, adhesion test, homogeneity test, drying time test and syneresis test. The results of statistical data analysis on the pH test, spreadability test, drying time test found no effect of concentration variations, whereas on the adhesion test and syneresis test there was an effect of concentration variations.

ACKNOWLEDGEMENT

We thank STIKes Muhammadiyah Ciamis for providing support for this research. We also thank our family and friends who have provided support and encouragement, both moral and material, to always pour out their prayers in every situation with sincerity.

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