International Journal of Health and Medicine
Volume 2, Number 1 Year 2025
e-ISSN: 3047-793X, p-ISSN: 3047-7948, Page 258-268
DOI: https://doi.org/10.62951/ijhm.v2i1.244
Available online at: https://international.arikesi.or.id/index.php/IJHM

Optimization of Gelling Agent Peel-Off Face Masks Formula From Loaded Red Bracts of Kepok Banana Flower (*Musa Paradisiaca* L.)

Siti Fatimah Hanum [1 *], Satheesh Babu Natarajan [2], Muhammad Gousuddin [3], Rizka Angrainy [4]
[1-3] Department Pharmacy, Lincoln University College, Malaysia, 47301, Petaling Jaya, Malaysia
[4] Department Health Science, Lincoln University College, Malaysia, 47301, Petaling Jaya, Malaysia

*Corresponding author: hanumfatimah.2171@gmail.com**

Abstract. *A peel-off facial mask is a cosmetic preparation in the form of a gel, which is applied to the skin of the face and left to dry so that a transparent film is formed that is elastic and easy to remove. One of the factors that influences the characteristics of peel-off gel face masks is the gel-forming ingredients which have different characteristic properties. The aim of this research was to determine the effectiveness of loaded red bracts of Kepok banana flowers (Musa paradisiaca L.) which were formulated into peel-off face maks with varying gelling agent concentrations. This research was carried out experimentally in the laboratory, including: taking plant samples using purposive sampling, sample processing and plant determination, making extracts using ultrasonic waves, making peel-off face mask preparations with gelling agent concentrations, physical evaluation of the preparations and stability test. The research results showed that the physical preparation of the peel-off face mask loaded with red bracts of Kepok banana flowers (Musa paradisiaca L.) was brownish red in color, odorless, gel texture, transparent, sticky, thick, non-synergic and homogeneous. The stability results show that there is a change in pH before and after test.*

Keywords *Musa paradisiaca L., gelling agent, peel-off face mask, loaded red bracts of Kepok banana flowers*

1. INTRODUCTION

The banana plant is a plant that grows in tropical areas and can also be cultivated in subtropical areas. Banana flowers or often called banana blossoms are part of the banana plant, located at the tip of the banana stem. The banana heart consists of purplish red banana bract on the outside and white on the inside and the bract are covered with yellow male flowers (Delpiana Sinta et al., 2023). Banana flower bract extract contains secondary metabolites of alkaloids, flavonoids, phenolics, glucosides and steroids (Gunavathyl et al., 2014, Chiang et al., 2020). Banana flower bract also contain anthocyanins such as delphinidin, pelargonidin, peonidin and malvin (Chiang et al., 2020., Pasmino et al., 2001) and (Pothavorn et al., 2010).

A peel-off face mask is a cosmetic preparation for face care in the form of a thick gel solution, which is applied to the skin of the face and left to dry so that a transparent film is formed that is elastic and easy to remove so there is no need to rinse. Peel-off masks have the benefit of cleaning the oil in the pores of the sebum glands, removing residual dirt, removing dead skin cells, and tightening the skin (Windiyanti et al, 2019).

Topical delivery of the activity of secondary metabolite compounds in plants can be in the form of a peel-off mask. In the peel-off mask formulation there are several ingredients that

Received: Desember 20, 2024; Revised: Januari 05, 2025; Accepted: Januari 19, 2025; Published : Januari 21, 2025

function as active ingredients, gelling agent, solvents, preservatives, binders, colorants and additional ingredients. Active ingredients can be used from extracted simplicia or chemicals, while for gelling agents Polyvinyl Alcohol (PVA), Carbomer, Gelatin and others can be used. PVA is a polymer that is often used in the preparation of gel masks, its function is to produce a gel that quickly forms a film (film forming) so that the mask can be easily peeled off after it dries (Wahyudin et al., 2024). Gelling agents influence the quality of peel-off mask preparations, because gelling agents can determine viscosity, elasticity, spreadability, and drying power. The use of PVA forms a transparent, elastic film layer, adheres well to the skin and can also increase the viscosity of the preparation thereby affecting the physical properties and stability of the preparation(Wira et al., 2023). Based on research by Lestari et al., (2013), a good PVA concentration forms an optimal gel layer in peel-off gel mask formulations ranging from 10-16%. The right PVA concentration will affect the physical stability and release of the active ingredients in the preparation. Several studies have shown that the concentration of PVA as a gelling agent in peel-off mask preparations varies due to the active ingredient content (Samsul et al., 2022).

2. LITERATURE REVIEW

The literature review and summary of various sources of research topics regarding banana peel-off masks can be seen in **Table 1**.

Table 1. Literature review and research summary of banana peel-off masks

Topics	**Author / Year**	**Method**	**Results**
Mask gel peel-off saba banana skin gel mask (Musa acuminate x Musa balbisiana (ABB) cv) with different concentrations humectant honey	Arviani / 2022	This research was applied with a quantitative approach	Peel-off gel mask preparation, kepok banana peel extract peel-off gel mask has good physical appearance, pH, dry time, spreadability in accordance with existing requirements and for the best formulation the Kepok banana peel extract mask is prepared in the form of peel-off gel based on the preference test is formulation 3 with a humectant concentration of 25%.
Formulation of peel-off mask gel from Kepok banana peel (*Musa paradisiaca* L.)	Sumiyati / 2017	This research was applied with a quantitative approach	The peel-off gel mask formulation consists of components such as banana peel, polyvinyl alcohol, HPMC, glycerin, potassium sorbate, 70% ethanol, aquades.
Characteristics of the peel-off mask ethanol extract of Kepok	Liska Gintulangi / 2022	This research was applied	All treatments are using seaweed has the strongest antioxidant activity in the F3 formula, namely 73.56 ppm, viscosity

banana peel (*Musa paradisiaca*) fortified with seaweed (Kappaphycus alvarezii) as an antioxidant agent		with a quantitative approach	value 4250 cps, pH 4.50 meets SNI requirements, spreadability 5.82 cm, adhesion power 11.82 seconds, drying time is 26.19 minutes and has a favorable organoleptic aroma, color and texture panelist.
The effect of humectants in peel-off gel mask containing ethanol extract of yellow Kepok banana peel (*Musa balbisiana*) and its activity on P.Acnes	Desi Sri Rejeki / 2021	This research was applied with a quantitative approach	This analysis showed that the humectant variation significantly affected the physical characteristics of the gel peel-off mask. Based on the physical stability evaluation, the best formulation was formulation three (F3) which used honey as a humectant.
Formulation of the peel-off gel mask of ethanol extract of banana fruit skin (*Musa paradisiaca* L.) as antioxidant	Wiwis Yudistin Ramba / 2023	This research was applied with a quantitative approach	Kepok banana peel extract contained secondary metabolites, namely alkaloids, flavonoids, tannins, sponins, and phenolics. Kepok banana peel extract has antioxidant activity with an IC50 value, in the very strong category, namely 13.12 ppm.

3. METHODS

This research was conducted at the Pharmaceutical Technology Laboratory. Faculty of Pharmacy, Lincoln University College Malaysia and the Cosmetology Laboratory, Faculty of Pharmacy and Health, Helvetia Health Institute Medan, Indonesia.

Tools and materials

Tools

The tools used are: digital scales (Panda Scale PD-ACS-40), analytical balance (Ohaus PX224), glassware, digital water bath (4H-DWB-B-One), smoothing machine (Philips HR-2116) digital drying oven (OV 30 B-One), rotary evaporator, sonicator (Hielscher Ultrasonic UIP1000hdT), mesh sieve no. 60, hot plate, pH meter digital, caliper, viscometer (B-One), refrigerator, and stopwatch.

Materials

The materials used in this research include: loaded red bracts of Kepok banana flowers (*Musa paradisiaca* L.), polyvinyl alcohol, methyl paraben, propyl paraben, polyvinyl pyrrolidone K30, glycerin, 70% ethanol, and distilled water.

Research procedure

Making simplicia

The red bracts of Kepok banana flowers (*Musa pardisiaca* L.) were obtained by purposive sampling from Paya Geli Village, Sunggal District, Deli Serdang Regency, North Sumatra, Indonesia. Wet sorting of plants is carried out by selecting the appropriate parts, separating them from the base, washing with running water, draining, thinly chopping, weighing the wet weight, drying in a drying cupboard at 40-50ºC and weighing the dry weight. Next, grind the simplicia, sift using 60 mesh and store in an airtight container (Indonesia Ministry of Health, 2017).

Preparation of loaded

The manufacturer loaded by extracting the sonication method using a Hielscher Ultrasonic UIP1000hdt, 60 kHz vibration, 15 minutes time and 70% ethanol solvent at a ratio 1:10. The filtrate obtained was concentrated using a rotary evaporator at a temperature of 60ºC and evaporated over a water bath until a thick extract was obtained (Silvia et al., 2023).

Making peel-off face maks

Weigh all the ingredients, add the Polyvinyl alcohol little by little into the hot distilled water at a temperature of 80ºC while stirring until it expands and dissolves, then cool. In some 70% ethanol, dissolve Methyl paraben and Propyl paraben until dissolved, then add Provinyl pyrrolidone K30, let it swell and dissolve, add glycerin, stir until homogeneous, mix in the gelling agent Polyvinyl alcohol, stir util homogeneous, add loaded red bracts of Kepok banana flowers (*Musa paradisiaca* L.) which has been diluted with the remaining 70% ethanol, stir until even and homogeneous, pack the peel-off face mask into a suitable container. Then a physical evaluation and stability test is carried out (Samsul, 2022). The formula and variations in gelling agent concentration can be seen in **Table 2**.

Table 2. Peel-off face masks formulations with variations in gelling agent concentration

Material	**Amount (% w/w)**				
	Formula 1	**Formula 2**	**Formula 3**	**Formula 4**	**Formula 5**
Loaded red bractea extract of *Musa paradisiaca* L. flower	0	1	1	1	1
Polyvinyl alcohol	15	7.5	10	12.5	15
Polyvinyl pyrrolidone K30	5	5	5	5	5
Glycerin	10	10	10	10	10
Methyl paraben	0.2	0.2	0.2	0.2	0.2
Propyl paraben	0.1	0.1	0.1	0.1	0.1

Ethanol 70%	15	15	15	15	15
Distilled water add	100	100	100	100	100

Evaluation of peel-off face masks

Physical evaluation of peel-off face mask preparations includes: organoleptic tests to determine the color, aroma and texture of the preparation by making visual observations, homogeneity tests to determine whether there are coarse particles or unmixed color composition by placing 0.5 g of the preparation on a glass transparent, then covered with another transparent glass and observed visually in bright conditions, pH test to determine whether the pH of the preparation corresponds to the pH of human skin by mixing 0.5 g of the preparation with 50 mL of distilled water, then measured using digital pH meter that has been calibrated to a constant pH value. Organoleptic, homogeneity and pH tests are carried out after the preparation is finished, every week untik 12 weeks of storage at room temperature. To test the dry time, apply 0.5 g of the preparation evenly to the skin of the upper arm 5 cm x 5 cm, then measure the dry time with a stopwatch. Test the spreading power by placing 0.5 g of the preparation in the middle of a flat glass then covering it with another flat glass, measuring the spreading diameter without load, 50 g, 100 g and 150 g load with a caliper. Viscosity test using spindle vicometer no. 4. Dry time, speadability, and viscosity checks are carried out after the preparation in finished. Evaluation of the stability of the preparation by cycling test for 6 cycles, each cycle is stored in a refrigerator at 4±2ºC for 24 hours and in an oven at 40±2ºC for 24 hours, observing, among other things: organoleptic test, homogeneity test and pH test (Wira et al., 2023) and (Samsul et al., 2022).

4. RESULTS AND DISCUSSION

Making simplicia of red bracts of Kepok banana flowers (*Musa paradisiaca* L.)

Drying plants aims to reduce the water content of the plants so that they have along shelf life and are not easily overgrown by bacteria and fungi. The water content lost during the drying process is characterized by a decrease in simplicia. Based on these requirements, the maximum drying shrinkage limit is not less than 10% [11]. Drying loss is one of the non-specific parameters that shows the maximum limit on the amount of compounds lost in the plant drying process (Maryam et al., 2020). The drying shrinkage of the red bracts of the Kepok banana flower (*Musa paradisiaca* L.) after drying at a temperature of 40-50ºC for 5 days was 9.3% with a brittle, easily crushed, brownish red color.

Preparation of loaded

The results of making loaded from red bract of Kepok banana flowers (*Musa paradisiaca* L.) using 70% ethanol solvent using the UAE method, obtained a yield of 21.7%, the organoleptic content of loaded is brackish red brown, has a distinctive aromatic odor, thick and sticky texture. The yield is the comparison between the initial simplicia powder used and the loaded results obtained after the extraction process (Wijaya et al., 2018). A good yield is obtained if more than 10% of the value is obtained, the higher the yield value indicates that the extract value obtained is greater. Using the UAE method in the extraction process produces a more concentrated and abundant extract, this is because ultrasonic waves can increase the breakdown of plant cell walls that have been soaked in solvent (Andriani et al., 2019) and (Asni et al., 2023).

Peel-off face masks evaluation results

The aim of the peel-off face masks formulation loaded with red bracts of Kepok banana flowers (*Musa paradisiaca* L.) with varying concentrations of PVA gelling agent 7.5% (Formula 2), 10% (Formula 3), 12.5% (Formula 4) and 15% (Formula 5) in order to get the right gelling agent concentration in the preparation and as a comparison without loaded bracts with a gelling agent concentration of 15% (Formula 1).

The results of the evaluation of the organoleptic physical preparation and the homogeneity of the peel-off mask containing the red bracts of the Kepok banana flower (*Musa paradisiaca* L.) with variations in the concentration of PVA gelling agent showed that the preparation had a brownish red color, was odorless, had a transparent gel texture, was sticky, thick, and had no experiences syneresis and is homogeneous because there are no vesible coarse particles or lumps in the preparation. Increasing the concentration of the gelling agent affects the viscosity of the preparation. Observations were made for 12 weeks stored at room temperature without any changes. The length of storage does not affect and there is no decomposition of the color, aroma and texture as well as homogenization of the preparation. Homogeneity is related to the effectiveness of the preparation because the active substance is distributed evenly and will be the same for each use and ensures that the active substance is completely dispersed or dissolved in the vehicle, characterized by an even distribution of the active substance in the base (Wira et al., 2023) and (Anindhita et al., 2023).

The results of the physical preparation evaluation showed that the pH value of the preparation was quite stable during 12 weeks of storage. Storage at room temperature in the first week after manufacture experienced a slight decrease in pH values. When the peel-off mask preparation was completed, the pH of Formula 1 preparation was pH 6.38, Formula 2 pH

6.05, Formula 3 pH 6.19, Formula 4 pH 6.27 and Formula 5 pH 6.29. After 4 and 8 weeks of storage the pH value was stable. Formulas 1 and 2 at week 12 experienced a slight decrease in pH compared to the test at week 8, a fairly stable decrease in pH during storage. The pH value in the formula is related to the safety of the preparation. A pH value that is too acidic can cause irritation in the area where the preparation is used, while a pH value that is too alkaline can cause dry skin (Anindhita et al., 2023). Preparations administered topically must meet the skin pH requirements of 4.5-6.5 (Samsul et al., 2022). The results of the organoleptic physical evaluation, homogeneity and pH value of the peel-off face mask preparation can be seen in **Table 3.**

Table 3. Evaluation results of physical preparation of the peel-off face masks

Time	Test	Formula 1	Formula 2	Formula 3	Formula 4	Formula 5
Week 0	Color Aroma Texture	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent
	Homogeneity	Homogeneous	Homogeneous	Homogeneous	Homogeneous	Homogeneous
	pH	5.38	5.05	5.27	5.20	5.44
Week 1	Color Aroma Texture	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent
	Homogeneity	Homogeneous	Homogeneous	Homogeneous	Homogeneous	Homogeneous
	pH	5.13	4.85	5.02	5.08	5.12
Week 4	Color Aroma Texture	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent
	Homogeneity	Homogeneous	Homogeneous	Homogeneous	Homogeneous	Homogeneous
	pH	5.02	4.83	5.03	5.10	5.12
Week 8	Color Aroma Texture	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent
	Homogeneity	Homogeneous	Homogeneous	Homogeneous	Homogeneous	Homogeneous
	pH	5.01	4.81	5.03	5.15	5.10
Week 12	Color Aroma Texture	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent	Brownish red Odorless Gel transparent
	Homogeneity	Homogeneous	Homogeneous	Homogeneous	Homogeneous	Homogeneous
	pH	4.95	4.50	5.02	5.17	5.11

The results of the evaluation of the physical preparation during drying of the peel-off face masks show the time needed to dry and form a transparent film on the skin where the

preparation is applied. Formula 2 takes longer to dry compared to Formula 1, 3, 4 and 5, while Formula 5 takes longer to dry compared to Formula 1, 2, 3 and 4. This can be caused by the concentration of the PVA gelling agent in Formula 5 being higher than in Formula 1, 2, 3 and 4. The results obtained were dry time. Formula 1 dried in 21 minutes 24 seconds, Formula 2 dried in 28 minutes 53 seconds, Formula 3 dries in 25 minutes 10 seconds, Formula 4 dries in 20 minutes 17 seconds and Formula 5 dries in 18 minutes 36 seconds. Based on the requirements for a good dry time for a peel-off mask, namely 15-30 minutes. The higher the concentration of PVA, the less water it contains so it dries more quickly. The large amount of water content in the preparation will slow down evaporation and the formation of a film layer on the peel-off gel mask (Windiyanti et al., 2019).

The results of the physical preparation evaluation of the spreadability of the peel-off face masks show the ability and speed of spread of the preparation applied to the skin. The addition of load in the test effects the diameter of the spreadability of the preparation and the concentration of the gelling agent also affects the spreadability of the preparation. Formula 2 has a wide spreading power compared to Formula 1, 3, 4, 5 and Formula 5 has a narrow spreading power compared to Formula 1, 2, 3 and 4. This is because the gelling agent concentration in Formula 2 is used less than other Formulas. When adding a load of 50 g, the preparation showed a wide spreadability for each formula, the same thing as adding a load of 100 g, whereas adding a load of 150 g had no effect on the diameter of the spreadability of the preparation after being given a load of 100 g. The spreadability test was carried out to determine the ability of the peel-off mask preparation to spread more easily when applied to the skin and the test using a load aims to determine the spread of the preparation when pressure is applied and the requirement for good spreadability of the preparation is 5-7 cm. Peel-off masks are easier to apply over the surface of the skin, indicating that the active substances in the mask are able to be distributed well (Samsul et al., 2022) and (Anindhita et al., 2023).

Evaluation of physical preparations, the viscosity of peel-off face masks aims to determine the viscosity of a semi-solid preparation and for a good peel-off gel preparation the viscosity is in the range of 2.000-50.000 mPa.s [Anindhita et al., 2023). The viscosity test results for the Formula 1 and Formula 5 peel-off face mask were higher than the other formulas, and the viscosity value was the lowest for Formula 2. The concentration of the gelling agent affects the viscosity of the preparation, the higher the concentration of the gelling agent, the higher the viscosity results and conversely, the concentration of the gelling agent is low, the viscosity of the preparation is also low. This is inversely proportional to the spreadability test results, a low gelling agent concentration produces a wide spreadability. The higher the

viscosity value of the gel preparation, the higher its durability. The viscosity value also affects storage at high temperatures, because the distance between the particles will increase due to the high temperature so that it can reduce the distance between the particles (Wahyudin et al., 2024). The results of the physical preparation evaluation on dry time, spreadability and viscosity of the peel-off face masks preparation can be seen in **Table 4.**

Table 4. Results of evaluation of physical preparation dry time, spreadability and viscosity of peel-off face masks preparation

SN.	Evaluation of physical preparation	Formula 1	Formula 2	Formula 3	Formula 4	Formula 5
1	Drying power	21:24 min	28:53 min	25:10 min	20:17 min	18:36 min
2	Spread power	5.30 cm	6.22 cm	5.81 cm	5.75 cm	5.42 cm
3	Viscosity	5254.72 cps	6414.04 cps	5879.70 cps	5930.68 cps	5772.07 cps

The results of evaluating the stability of peel-off face masks preparations using the cycling test showed that the 5 peel-off face masks formulas loaded with red bracts of Kepok banana flowers (*Musa paradisiaca* L.) for organoleptic and homogeneity tests were stable at a temperature of 4±2ºC and temperature of 40±2ºC for 6 cycles, while in pH testing there was an influence of temperature on the pH value of the preparation, there was a decrease in the pH value in all Formula for 6 sycles. In the stability test, the Formula 2 preparation did not meet the pH value requirements after the cycling test was carried out. The results of the pH value of each Formula after 6 cycles, namely Formula 1 pH value 4.77, Formula 2 pH value 4.23, Formula 3 pH value 4.86, Formula 4 pH value 5.01 And Formula 5 pH value 5.17. The results of the stability evaluation before and after the peel-off face masks preparation can be seen in **Table 5**.

Table 5. Stability evaluation results before and after the pH value of the peel-off face masks

SN.	Formula	pH Before	pH After					
			Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
1	Formula 1	5.38	5.18	5.12	5.07	5.00	4.95	4.77
2	Formula 2	5.05	4.82	4.77	4.68	4.62	4.57	4.23
3	Formula 3	5.27	5.09	5.01	5.01	4.96	4.89	4.86
4	Formula 4	5.20	5.15	5.10	5.03	5.00	5.02	5.01
5	Formula 5	5.44	5.37	5.28	5.25	5.19	5.17	5.17

Preparation stability testing aims to determine the quality of the preparation and its characteristics regarding the influence of time and temperature and the packaging during

storage still meets the requirements determined based on the physical properties of the preparation.

5. CONCLUSION

Loaded red bracts of Kepok banana flowers (*Musa paradisiaca* L.) can be formulated as a peel-off face masks and there is an influence on the concentration of the gelling agent used on the physical properties of the preparation, texture, pH, dry time, spreadability, viscosity and stability. Formula 5 with a gelling agent concentration of 15% is better than Formula 1, 2, 3 and 4 for peel-off face masks preparations.

LIMITATION

This research is still far from perfection due to limited tools and materials as well as the methods used by researchers in making extracts, making peel-off face masks preparations and testing them. Researchers hope that in the future it can be developed, such as irritation testing, hedonic testing, long-term stability testing, drug delivery system testing, in vitro and in vivo testing.

REFERENCES

Andriani, M.Gde., Mayun Permana, I.D., & Rai Widarta, I.W., (2019). Effect of Temperature and Extraction Time of Star Fruit Leaves (Averrhoa blimbi L.) on Antioxidant Activity Using The Ultrasonic Assisted Axtraction (UAE) Method. *Journal of Food Science and Technology*, 8(3), 330-340.

Anindhita M.A., Prastiwi D., Lu'lu Nur, (2023). The Effect of Using Polyvinyl Alcohol as a Gelling Agent on the Physicochemical Properties of Ethanol Extract Peel-off Gel from Pedada Friut. *Pharmaceutical Scientific Journal*, 12(1), 19-29.

Asni Amin, Aqila Alviola Bani, Abdul Mun᾽in, Maksum Radji, (2023). Ratio of Soaking Value and Duration of Ethanol Maserate Extracrion for Burahol Fruit Flesh (S*telecocharput burahol*) Based on The Simplicia Preparation Method. *Makasar Natural Product Journal*, 1, 176-184.

Chiang, S.H., Yang, K.M., Lai, Y.C., Chen, C.W., (2020). Evaluation of The in Vitro Biological Activities of Banana Flower and Bract Extract and Their Bioactive Compounds. *International Journal of Food Properties*, 24(1), 1-16.

Delpiana Sinta, Rosmidah Hasibuan, (2023). Morphological Analysis of Kepok Banana Plants (*Musa paradisiaca* Var. *Balbasiana colla*) in Tanjung Selamat Village, South Labuhanbatu Regency. *Bioscientist: Biology Scientific Journal*, 11(1), 86-97.

Gunavathyl N., Padmavathy S., Murugavel S.C., (2014). Phytochemical Evaluation of Musa acumibate Bract Using screening of FTIR and UV-VIS spectroscopic Analysis. *Journal International Academy Research Multidisciplinary*, 2, 212-221, 2320-5083.

Indonesia Ministry of Health, (2017). Indonesian Herbal Pharmacopoeia, 2th ed.

Lestari P.M., Sutyasningsih R.B., Ruhimat R., (2013). The Influence of Increase Concentration Polivinil Alcohol (PVA) as a Gelling Agent on Physical Properties of The Peel-Off Gel of Pineapple Juice (*Ananas comosus* L.). *International Asia Societices of Cosmetic Scientists Conference*, 127.

Maryam F., Taebe B., Toding DP., (2020). Measurement of Specific and Non-Specific Parameters of Ethanol Extract of Matoa Leaves (*Pometia pinnata* JR & G. Forst). *Mandala Pharmacon Indonesia Journal*, 6(1), 1-12.

Pasmino, D.E.A., Giusti, M.M., Wrolstad, R.E., Gloria, M.B.A., (2001). Anthocyanins from Banana Bracts (MusaX Paradisiaca) as Potential Food Colarants, *Food Chem*, 73 (3), 327-332.

Pothavorn P., Kitdamrongsont K., Swangpol S., Wongniam S., Atawongsa K., Svasti J., Somana J., (2010) Sap Phytochemical Compositions of some Bananas in Thailand. *Journal of Agricultural and Food Chemistry*, 58(15), 8782-8787.

Samsul Een, Jumain, Sinala Santi, (2022). Peel Off Gel Mask Formulation with Langsat Fruit Skin Extract (*Lansium domesticum* L) with PVA (Polyvinyl Alcohol) Variations. *Mandala Pharmacon Indonesia Journal*, 8(2), 151-164.

Silvia T.A.N., Harjono, Cepri K., Samuel B.W.K., (2023) Optimization Companulata P. Beauv) and Optimization of it's Application as A Textiles Dye. *Indonesia Journal Chemistry Science*, 12(2), 143-160.

Wahyudin B.J., Rifka A., Aristha N.P., (2024). Formulation of Peel Off Gel Mask with 70% Ethanol Extract from Manila Sapodilla Leaves (*Manilkara zapota* L.). *Farmasyifa Pharmaceutical Scientific Journal*, 7(2), 216-227.

Wijaya H., Novitasari, Jubaidah S., (2018). Comparison of Extraction Methods on The Yield of Sea Rambui leaf Extract (Sonneratia caseolaris L. Engl). *Manuntung Scientific Journal*, 4(1).

Windiyanti, Mayasari T., (2019). Beauty Skin Care: Complete Guide to Aesthetic Facial Skin Care, PT. Gramedia Pustaka Utama. 16-50.

Wira N.S., Rodhia U., Sandry E.S., (2023). Preparation and Evaluation of Peel-Off Gel Mask of Red Glutinous Rice Bran (*Oryza sativa* L var. Glutinosa) Extract Using Polyvinyl Alcohol (PVA) as Gelling Agent. *Journal of Pharmaceutical and Sciences*, 1(1), 246-254.