

Research Article

The Formulation of the Peel off Gel Mask Preparation of Shallot Peel Extract (*Allium cepa* L.) as an Antioxidant

Tutik¹, Vivi Sekar Anggraini¹, Anofita¹, Slamet Widodo*², Nabila Diandra Septiani²

¹Department of Pharmacy, Faculty of Health Science, University of Malahayati, Lampung, Indonesia.

²Faculty of Medicine, University of Malahayati, Lampung, Indonesia.

ARTICLE INFO

Article history:
Received: 08/01/2022;
Revised: 08/01/2022;
Accepted: 22/01/2022.

Key Words:

Shallot peel (*Allium cepa* L.), antioxidant, peel off gel mask.

Please cite this article as:

Widodo, S. et al. The Formulation of The Peel off Gel Mask Preparation of Shallot Peel Extract (*Allium cepa* L.) as an Antioxidant. 4(1), 011-019.

ABSTRACT

Shallot peel was known to contain secondary metabolites having the potential substances as antioxidants. This study aimed to determine whether shallot peel extract (*Allium cepa* L.) could be formulated into peel off gel mask preparation and to determine the antioxidant activity of the peel off gel mask preparation of shallot peel extract (*Allium cepa* L.). The method of this research was the extraction of shallot peel using the maceration method with methanol solvent. The extraction results obtained were made into a peel off gel mask preparation and tested for antioxidant activity with DPPH. The extraction results obtained was yield of 3.036%. The results of the evaluation of the peel off gel mask preparations obtained the peel off gel mask met the requirements and was stable in the formulation II with a concentration of 1% shallot peel extract. The results of the antioxidant activity test of the peel off gel mask obtained IC₅₀ of 29.97% ppm. The antioxidant activity of the peel off gel mask shallot peel extract was included in the category of very strong antioxidant.

©2022 Published by International Journal of PharmaO₂. This is an open access article.

*Corresponding author: e- mail: slametw@malahayati.ac.id

INTRODUCTION

The skin is very supportive of the appearance of someone, therefore the skin needs to be cared for, maintained, and kept healthy. Skin which is cared for and maintained will look healthy, well-groomed and shine freshness (Wirajayakusuma, 1998). Skin is a layer that covers the body and protects the body from various kinds of dangers coming from outside (Siti and Juwariyah, 2018). Facial skin exposed to ultraviolet light can cause skin problems such as wrinkles, premature aging, and acne (Grace et al., 2015). One of the things that can cause skin damage is free radicals such as ultra violet rays (Maysuhara, 2009). Excessive ultra violet rays can cause several problems on the skin ranging from redness, pigmentation, even for a long time can cause the risk of cancer (Sari, 2015). The free radicals with excessive amounts on the skin can cause

damage to the collagen of the skin cell membrane; therefore the skin will become inelastic and dry wrinkled (Thaib, 2008). The body actually already has enzymes which can ward off free radicals, but if there are too many free radicals containing enzymes are not able to work optimally. Thus we need antioxidants to ward off free radicals.

Antioxidants play a very important role in protecting the skin because the antioxidants can absorb free radicals and then they are neutralized again, by donating one electron thus they become more stable compounds (Tanjung et al., 2020). There are two kinds of antioxidants, they are synthetic antioxidants and natural antioxidants. Natural antioxidants are found in plants, vegetables and fruits (Winarsi, 2005). While synthetic antioxidants often used are Butylated hydroxyanisole (BHA), Butylated hydroxytoluene (BHT), Propyl gallate (PG) and Terbutyl Hydroquinone (TBHQ)

(Cahyadi, 2019). A Synthetic antioxidants used for a long time can cause liver damage and have toxic and carcinogenic effects on the human body, thus the natural antioxidants become a need alternatively (Puspitasari *et al.*, 2019). The natural antioxidants used can prevent harm to the body and have the advantage of lower costs. One of the plants which has the potential to be developed as a natural antioxidant is shallot peel. Shallot (*Allium cepa* L.) is one type of vegetable used as an ingredient or food seasoning. Shallots produce waste in the form of skin contains active compounds. In addition, the chemical compounds in the shallot peel contain flavonoids, saponins, tannins, alkaloids and terpenoids (Prabowo and Noer, 2020; Mardiah *et al.*, 2017). The flavonoid compounds contained in shallot peel extract have the potential as antioxidants to prevent the development of free radicals and can repair damaged cells in the body (Soebagio and Rusdiana, 2007). The antioxidant compounds in shallot peel can be used to treat skin problems. Preparations are indicated for better facial skin formulated in topical dosage forms. Topical preparations cause the active substance to be in longer contact with the surface of the facial skin. One of the topical preparations is a face mask. Face masks are cosmetics applied to clean and tighten the skin, especially facial skin (Novita, 2013). Facial masks in the form of a gel are practical masks, usually known as peel-off gel masks (Lucida *et al.*, 2017). Peel off gel mask is one type of facial mask functioning to the more advantages in the use, as a mask which can be easily removed like an elastic membrane (Rahmawanty *et al.*, 2015). Peel off gel masks are usually in the form of a gel or paste, which is applied to the facial skin within a certain time then wait for moment to dry, this preparation will form an elastic transparent film layer, therefore it can be peeled off. Peel off gel masks from natural ingredients have several benefits including repairing and treating facial skin from problems of wrinkles, aging, and acne (Grace *et al.*, 2015). Research on anti aging moisturizer gel preparations have been made from ethanolic extract of shallot peel obtained the best concentration of 8% which has antioxidant activity with an IC₅₀ value of 146.40 ppm is included in moderate antioxidant activity (Feladita and Junova., 2021).

Based on the description above, the author wants to carry out the study on the extraction of shallot peel using the maceration method with ethanol as a solvent. The shallot peel extraction obtained will be formulated for peel off gel mask preparations and tested for antioxidant activity using the DPPH method.

MATERIAL AND METHODS

Materials

The tools used in this research were analytical balance, filter paper, beaker glass, stirring rod, rotary vacuum

evaporator IKA RV 10 Basic, mortar and stamper, glass bottle, bunsen, dropper, measuring cup, watch glass, pH meter, measuring flask, test tube, aluminum foil, cuvette, label paper, and spectrophotometer of UV-Vis Genesys 20.

The materials used in this study were shallot peel extract, methanol, polyvinyl alcohol (PVA) with brand of 72000 BioChemica, hydroxy propyl methylcellulose (HPMC) with brand of "making cosmetics", propylene glycol with brand of PT. Brataco, DPPH (2,2-diphenyl-1-picrihydrazil), distilled water, ascorbic acid, hydrochloric acid, Mg powder, Mayer's reagent, FeCl₃, alcohol and chloroform.

Methods

Preparing the Sample and Extraction

The samples were taken using a random sampling method, as samples from shallot traders in several Pringsewu Regency Traditional Markets where all traders have the same opportunity to be selected. The shallot peel used was the outermost layer. The shallot peel was sorted wet and washed with running water. Then dried without direct sunlight for 2 to 3 days. Furthermore, the shallot peel is sorted dry to separate the skin of the shallot peel which is damaged due to drying. After that, the samples were mashed with a blender until it became a powder or simplicia which is ready for extraction.

With a total of 500 g of shallot peel simplicia was macerated using 5 L of methanol as a solvent. The maceration was carried out for 4 days. Every 24 hours the solvent was changed, stirring occasionally and after finishing the maceration process, the extract was filtered using filter paper. The filtrate obtained was concentrated using a rotary vacuum evaporator at a temperature of 38 °C. The thick extract obtained was roasted at a temperature of not more than 40 °C to form a paste.

Screening of Phytochemical

The Test of Flavonoid- The methanolic extract of shallot peel was taken into 0.5g then added 10mL of hot distilled water, boiled it for 10 minutes and filtered in hot conditions; the filtration obtained was taken 5mL and then added 0.1 g of Mg powder and 1mL of hydrochloric acid (HCl). With high concentrated and 2mL of amil alcohol, shaken and allowed to separate. A positive test result indicates that the solution turned into red, yellow, and orange on the amil alcohol layer.

The Test of Alkaloid- As many as 0.5g of shallot peel methanol extraction was taken into a test tube and added 1 mL of 2N hydrochloric acid and 9mL of distilled water, heated on a water bath for 2minutes, cooled and then filtered. The filtration was used for the alkaloid test then 3 test tubes were taken and 0.5mL of the filtration was inserted into each test tube. The first tube was added with 2 drops of Mayer's reagent, the second tube was added with 2 drops of Dragendroff's reagent and the

third tube was added with 2 drops of Bouchardat. A positive test result indicates that a yellow precipitation was formed in the first tube, an orange precipitation was formed in the second tube and a brown precipitation was formed in the third tube.

The Test of Saponin- As many as 0.5g of shallot peel extraction was put into a test tube and added 10mL of distilled water which was heated and then cooled and then shaken vigorously for 10 seconds. A positive test result was obtained if there was foam for not less than 10 minutes in 1 to 10 cm, then added 1 drop of 2N hydrochloric acid. A positive test result indicated that the foam does not disappear.

The Test of Tanins- As many as 0.5g of shallot peel methanol extraction was dissolved with 10 mL of distilled water, and then filtered using filter paper. Furthermore, the filtration obtained was taken as 2 mL and then added 2 drops of 1% FeCl₃ reagent. A positive test result indicated that the formation of a blue or blackish green color.

The Test of Terpenoid-As many as 0.5g of shallot peel extract was added into 10 mL of chloroform and placed in a dry test tube, then Liebermann Burchard reagent (acetic acid and concentrated sulfuric acid) was added. A positive test result would indicate if it was at orange or purple.

Formulation of the Preparation of Peel off Gel Mask

The peel off gel extract of shallot peel was made by expanding PVA and HPMC in separated containers. Container A was put in PVA then added enough distilled water, then heated on a water bath and stirred until homogeneous. Furthermore, in container B, HPMC was added to which cold distilled water then added and stirred until homogeneous. Meanwhile, container B was mixed into container A and stirred until homogeneous. After being homogeneous, the shallot peel extraction which had previously been dissolved in distilled water was added little by little and grinded it until homogeneous. Then put it in a container and then labeled it according to the concentration of the mask.

Table 1: The Formulation of Peel off Gel Mask

No	Materials	Function	Formulation			Control (-)	Control (+)	Unit
			F 1	F 2	F 3			
1	The shallot peel extraction	Active substance	0.1	1	2	0	Peel Off Gel Mask commercial	g
2	PVA	Film forming	12	12	12	12		g
3	HPMC	Gelling agent	1	1	1	1		g
4	Propylene Glycol	Humectants	15	15	15	15		g
5	In 100g of aquadest	Solvent	100	100	100	100		g

Notes: Formulation I- The concentration of shallot peel extract at 0.1%; Formulation II -The concentration of shallot peel extract at 1%; Formulation III- The concentration of shallot peel extract at 2%; Negative Control- The formula without extraction; Positive Control- The Peel Off Gel Mask commercial.

The Evaluation of the Preparation of the Peel off Gel Mask

The Test of Organoleptic- The test of organoleptic was carried out directly on the peel off gel mask preparation of shallot peel extraction covering color, smell, shape and texture.

The Test of pH- The test of pH was carried out by weighing the preparation of the peel off gel mask of 1 gram shallot peel extraction and dissolved into 10 mL of distilled water. Then dip the pH meter into the preparation of the peel off gel mask of shallot peel extraction.

The Test of the Homogeneity- The homogeneity test can be carried out by smearing the preparation of the peel off gel mask of shallot peel extraction then it was applied into two pieces of glass or other suitable

transparent material, the preparation must show a homogeneous composition and must not have coarse grains.

The Test of the Irritation-The test of the irritation was conducted on 10 volunteers. The preparation of the peel off gel mask of the shallot peel extract was taken sufficiently and then applied to the hands for 30 minutes. The symptoms observed were generally positive irritation reactions characterized by redness, itching or swelling of the treated skin.

The Test of the Drying Speed Time-The test of drying speed time was carried out by smearing the peel off gel mask of shallot peel extraction into the forearm and observing the time for the preparation to dry, as the time from the moment was applied until a film was formed from the peel off gel mask of the shallot peel extraction

using a stopwatch. The requirement for the preparation time to dry was for 15 to 30 minutes.

The Test of the Likeness (Hedonic test)-The 3 preparations of the peel off gel mask of the shallot peel were tested on 10 volunteers by cleaning the skin of the arm from dirty or dust firstly. Firstly, observing the texture, aroma, color and moisture from the sample then the peel off gel mask preparation was applied to the hands. The rating consists of likes, likes, dislikes and dislikes very much.

Antioxidant Activity

Making the DPPH solvent-A total of 10 mg of DPPH was dissolved into 10 mL of methanol. The 10 mL of DPPH solvent pipetted was diluted with 100 mL of methanol to produce 100 ppm.

Making the Master Solvent of Shallot Peel Extraction-The 10 mg of shallot peel was weighed and then put into a 100 mL volumetric flask, added methanol until the mark obtained a solution of 100 ppm shallot peel extract. The shallot peel extract solvent was made up with a series of concentrations of 10 ppm, 15 ppm, 20 ppm, 25 ppm, and 30 ppm. Each series solution of shallot peel extract was taken 3 mL and added 2 mL of DPPH, the solvent was homogenized and then allowed to stand for 30 minutes in a dark room.

Making Master Solvent of Peel Off Gel Mask of Shallot Extraction-The 1 gram of peel off gel mask of shallot peel extract was weighed and then put into a 100 mL volumetric flask, added methanol until the mark was obtained a solution of 100 ppm of peel off gel mask of gel extract. The solvent was made up by a series of concentrations of 10 ppm, 15 ppm, 20 ppm, 25 ppm, and 30 ppm. From the solvent series was taken in 3 mL solvent and it was added by 2 mL of DPPH added. The solvent was homogenized and then allowed to stand for 30 minutes in a dark room.

Making Master Solvent of the Ascorbic Acid-The 10 mg of ascorbic acid was weighed and then put into a 100 mL volumetric flask, added methanol until the mark obtained a solvent of 100 ppm ascorbic acid. Then 5 mL of 100 ppm standard solvent was pipetted and put into a

10 mL volumetric flask, added with methanol to the mark. Ascorbic acid solvent was made up by a series of concentrations of 4 ppm, 6 ppm, 8 ppm, 10 ppm and 12 ppm. From the series solvent was taken 3 mL of ascorbic acid and 2 mL of DPPH. The solvent was homogenized and then allowed to stand for 30 minutes in a dark room.

Making of a Solvent to Determine the Maximum Wavelength-A total of 1.8 mL of DPPH solvent added into 1.2 mL of methanol, allowed to stand for 30 minutes in the dark room.

Measuring the Maximum Wavelength-The absorbance of the DPPH solvent which had been made then it was measured at a wavelength of 400-800 nm.

Measuring the Antioxidants of the Shallot Peel Extract-The shallot peel extract solvent which had been prepared was measured for absorbance at the maximum wavelength obtained from the determination of the maximum wavelength.

Measuring the Antioxidant of the Peel Off Gel Mask of the Shallot Peel Extract-The peel off gel mask extraction solvent of shallot peel extract which had been made up was measured for its absorbance at the maximum wavelength obtained from the determination of the maximum wavelength.

Measuring the Antioxidant of the Ascorbic Acid-The ascorbic acid solvent which had been made was measured for absorbance at the maximum wavelength obtained from the determination of the maximum wavelength.

The Calculation of IC₅₀

The IC₅₀ value was calculated based on the percentage of inhibition of the DPPH radical from each concentration of the solution and obtained the linear equation $y = a + bx$. The value of y was replaced with the number 50, therefore the value of x was obtained which indicated the value of IC₅₀. The antioxidant activity of the sample was determined by the amount of free radical uptake inhibition of DPPH by calculating the percentage of DPPH absorption inhibition using the formula (Andayani *et al.*, 2008)

$$\% \text{ Inhibition} = \frac{\text{The Control Absorption} - \text{The Sample Absorption}}{\text{The Control Absorption}} \times 100\%$$

Notes: The Control Absorption- The Absorption of DPPH solvent; The Sampel Absorption- The Absorption of the Test Solvent Reacted to the DPPH solvent.

DATA ANALYSIS

Based on the classification of Blois (1958) the level of antioxidant power with the DPPH method is categorized as follows:

Tabel 2: Tingkat Kekuatan Antioksidan (Blois, 1958)

Intensity	Mark of IC ₅₀ (ppm)
Very strong	<50
Strong	50-100
Moderate	101-150
Weak	>150

RESULTS AND DISCUSSION

The shallot peel simplicia (*Allium cepa* L.) is extracted by maceration method using methanol as solvent. The maceration process is taken because it has several advantages, such as easy way of working, the simple tools used and suitable for materials that cannot withstand heating (Depkes RI, 1968). The reason for using methanol as a solvent is because it has the same level of polarity as the compound to be taken. Methanol is an effective solvent for obtaining flavonoid

compounds, alkaloids, saponins, tannins and terpenoids because it is a polar solvent.

The results of the maceration process are concentrated by using a rotary evaporator to remove the methanol solvent used during the extraction process, therefore a concentrated filtrate has been produced. Then to remove the remaining solvent residing on the extraction, it is removed on the process by heating it, using an oven at the temperature of not more than 40oC for 2 days until the extraction is obtained in the form of a paste. The percentage (%) of yield obtained as much as 3.036% or 15.18 grams of extraction. The yield obtained is from 500 g of simplicia shallot peel with 5 L of methanol as solvent.

Table 3: The Results of Phytochemical Screening of Shallot Peel Extraction (*Allium cepa* L.)

Phytochemical	The Results of Observation	Notes
Flavonoid	The solvent is on orange red	Positive
Alkaloid	There is a white precipitation	Positive
Saponin	There is foam	Positive
Tannin	The solvent is on greenish black	Positive
Terpenoid	The solvent is on orange	Positive

The extract obtained is identified with the chemical content of the shallot peel extraction to see the presence or the absence of secondary metabolites extracted in the solvent used. The identification of chemical components is a simple way to perform a qualitative analysis of the content of compounds present in plants. Based on the results of phytochemical tests carried out on shallot peel extract is having positive to contain compounds including flavonoids, alkaloids, saponins, tannins and terpenoids.

Shallot peel extract is formulated in the form of the peel off gel mask preparation. Plant extractions which have distinctive characteristics to the formulation is necessary

to do in obtaining an effective base to produce gel preparations in good stability. In this study, the gel preparations chosen is hydrogel. Hydrogel is a gel with the main composition of water. The advantages of hydrogels are having good dispersion on the skin, good drug or substance release, not inhibit physiological functions and easy to wash, therefore they are very suitable for topical use (Voight, 1994).

The components used in making the peel off gel mask include the active substance (shallot peel extract), gelling agent (hydroxy propyl methylcellulose), film-forming (polyvinyl alcohol), humectant (propylene glycol) and solvent (aquadest). The combination of PVA with HPMC is chosen as the basis for the peel off gel mask because it will make the gel dry quickly and the peel off is strong and plastic to provide good contact with the skin, where the combination can expand in limited water, therefore it is a good hydrogel-forming material used as a preparation topically (Voigt, 1994). Another additive in the formulation of this peel off gel mask preparation is propylene glycol as a humectant. Humectants play an important role in gel preparations because they function to maintain the stability of the preparation by reducing the evaporation of water from the preparation (Martin, 1993).

The Results of Preparation Evaluation of the Peel Off Gel Mask

The test of Organoleptic on the peel off gel mask F(I), F(II), F(III) contains yellowish brown shallot peel extract produced from the color of shallot peel extraction. While the formula of negative control which does not have shallot peel extract is white. The three of the peel off gel masks have a characteristic of shallot peel smell, while the negative control has a characteristic of typical base smell for the peel off gel mask, and all formulations are in semisolid form. The test of organoleptic aims to obtain a peel off gel mask preparation which has an attractive color, better smell to be accepted to the user, and a convenient form to be used considering that this preparation is a topical preparation, therefore the aesthetic value of the peel off gel mask preparation must be considered appropriately.

Table 4: The Results of Organoleptic Observations

The Formula	Organoleptic		
	The Color	The Smell	The Form
Positive Control	Green	Typical Base	Semisolid
Negative Control	White	Typical Base	Semisolid
FI	Yellowish-brown	Typical shallot peel	Semisolid
FII	Yellowish-brown	Typical shallot peel	Semisolid
FIII	Dark brown	Typical shallot peel	Semisolid

Physical Stability Evaluation

The test of pH measured is to determine the pH of a preparation. The pH values of the four peel off gel mask

formulations ranged from 6.35 to 6.46. The results of the values of the four preparations correspond to the pH range of human skin. The pH value should not be too

acidic because it can cause skin irritation and it should not be too alkaline because it can cause skin irritation. The standard pH quality requirements for skin moisturizers according to Indonesian National Standard serial number 16-4399-1996 is in the range of 4.0 to 8.0. The homogeneity checked is to observe the presence or absence of coarse particles in the preparation. Homogeneity is one of the factors affecting the quality of the gel preparation. The homogeneity test is carried out on the five peel off gel masks, the results have good homogeneity, because there are no coarse particles in the preparation. The test results show that a homogeneous composition and the ingredients used in the peel off gel mask of shallot peel extract must be evenly distributed in the preparation. In addition, the homogeneity is affected by the stirring speed during the gel formulation process. Stirring speed aims to reduce the particle size, therefore each particle has the same opportunity to be in every part of the gel.

The test of skin irritation is done to prevent the side effects on the skin. The consumers will use cosmetics or will use new cosmetics, can apply the usage test, by using the cosmetics in other places and in a way which is usually used in everyday life. After being left for 24 hours there is no unwanted skin reactions, then the

cosmetics can be used. Based on the results of test of skin irritation conducted on 10 respondents by applying a peel off gel mask preparation of shallot peel extract on the skin behind the ears, the results show that all participants are negative on the irritation reaction parameters. The parameters observed were the presence of red skin, itching, or swelling (Tranggono and Latifah, 2007). The results of the irritation test can be concluded that the peel off gel mask preparation of shallot peel extract with the three formulations made is safe to be used.

The drying speed is needed to be tested because the preparation made in this study is a peel off gel mask, where the preparation must be able to dry after being applied to the skin after applying on the skin in the certain time and it can be completely lifted from the skin. This treatment will affect to the comfortable of the user during application, the longer the drying time will be more comfortable. The result of observations show that the formulation of the peel off gel mask preparation of the shallot peel extract has a range of 23 to 26 minutes, it meets the requirements. The time requirement for the preparation to dry is 15 to 30 minutes (Shai *et al.*, 2009).

Table 5: Results of Physical Stability Evaluation

The Formula	Homogeneity	pH	Irritation	The drying speed time (in minutes)
Positive Control	Homogeneous	6.52	Not irritating	23
Negative Control	Homogeneous	6.35	Not irritating	24
FI	Homogeneous	6.46	Not irritating	25
FII	Homogeneous	6.44	Not irritating	26
FIII	Homogeneous	6.42	Not irritating	26

The Test of the Preferences (Hedonic Test)

The test of the preference includes the preference on the texture, color, smell and on the moist to the preparations showed that in the formula II is preferred by the sample of respondents compared to the formula I and III. The test of preference is carried out with 10 sample of respondents and filled out the questionnaire data that have been provided. The test of the preference aims to evaluate the acceptability or level of preference of respondents for the products observed.

The result of the test of the preference on texture, color, smell and moist conducted to the samples of respondents, is most of them choose the formula II. It is because the formula II has a good texture and the right

color which is better than on the formula III, which is more concentrated or the formula I which is lighter in color, the smell is less pungent than F III and has good moisture. Based on the results of the evaluation of the test for peel off gel mask preparations, those are the test of organoleptic, the test of pH, the test of homogeneity, the test of skin irritation, the test of drying speed and the test of the preference on the three formulas, the results obtained good requirements, and the test of the preference is found that the formula FII containing 1% concentration of shallot peel extract preferred by the sample of participants. Therefore, the formula II is continued to the test for antioxidants using the DPPH method.

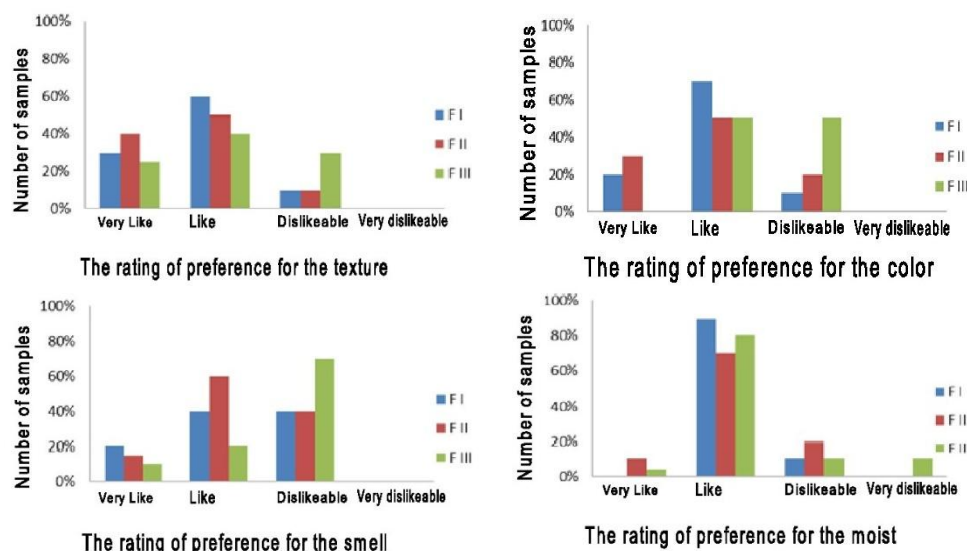


Fig.1: The Results of Prefences on Texture, Color, Smell, and Moist (n=10)

Antioxidant Activity

The antioxidant activity is tested using the DPPH method. DPPH is a free radical compound used as a reagent in the determination of antioxidants. DPPH can be used because antioxidant compounds are able to reduce DPPH free radicals. The purple DPPH solution gives the maximum absorbance at 515.5 nm, this DPPH solution will oxidize compounds in plant extracts. This process is characterized by the fading of the color of the solvent from purple to yellow (Widyastuti, 2010). The maximum wavelength obtained is 515nm, the wavelength obtained is then for reading to the antioxidant activity of shallot peel extract, ascorbic acid

and the peel off gel mask preparation of preparation extract. The antioxidant activity is read in 3 samples, those are shallot peel extract, ascorbic acid and peel off gel mask of shallot peel extract on the formula II. In this study, ascorbic acid is used as a standard for comparison, because ascorbic acid is a substance can reduce free radicals, cheap, easy and most often used in cosmetic preparations. Each sample is made in several concentration series to obtain absorbance and inhibition percentage (%) of DPPH. After obtaining absorbance data and inhibition percentage (%) of the sample, IC₅₀ is calculated by entering to the concentration as x and inhibition percentage (%) as y, therefore the regression equation will be obtained.

Tabel 6: The Results of Antioxidant Activity of Shallot Peel Extract and Peel off Gel Mask (*Allium Cepa L.*)

Samples	Conc. (ppm)	Absorbance	Inhibition (%)	IC ₅₀	Notes
Shallot Peel Extract	10	0.608	21.14	25.12 ppm	Very strong
	15	0.505	34.50		
	20	0.451	41.50		
	25	0.376	51.23		
	30	0.334	56.67		
Ascorbic Acid	4	0.436	43.45	05.92 ppm	Very strong
	6	0.384	50.19		
	8	0.337	56.29		
	10	0.266	65.49		
	12	0.253	67.18		
Shallot peel Extract of Peel Off Gel Mask	10	0.636	17.50	29.97 ppm	Very strong
	15	0.550	28.66		
	20	0.501	35.01		
	25	0.441	42.80		
	30	0.393	49.02		

The shallot peel extract (*Allium Cepa L.*) is made in a stock solvent with a concentration of 100 ppm. Then, it

is made into 5 series of concentrations, those are in 10 ppm, 15 ppm, 20 ppm, 25 ppm and 30 ppm. The IC₅₀

results of test obtained from shallot peel extract is 25.12 ppm, it means that shallot peel extract has a very strong antioxidant activity because it has an IC₅₀ value of <50 ppm.

The ascorbic acid is made in stock solvent with a concentration of 100 ppm. Then made into 5 concentration series, those are in 4 ppm, 6 ppm, 8 ppm, 10 ppm and in 12 ppm. The result of the test of IC₅₀ is 5.92 ppm, it means that ascorbic acid has a very strong antioxidant activity because it has an IC₅₀ value of <50 ppm. By comparing the IC₅₀ value of shallot peel extract towards ascorbic acid, the antioxidant activity of the extract is lower than ascorbic acid, this condition obtained because ascorbic acid is a purer compound than shallot peel extract which contains various secondary metabolites, therefore it is not pure anymore.

The formula II of the peel off gel mask of shallot peel extract (*Allium Cepa L.*) is made in a stock solution with a concentration of 100 ppm. Then it is made into 5 series of concentrations, those are in 10 ppm, 15 ppm, 20 ppm, 25 ppm and 30 ppm. The result of the test of IC₅₀ obtained from the formula II containing the peel off gel mask of shallot peel extract (*Allium Cepa L.*) is 29.97 ppm, it means that the peel off gel mask of shallot peel extract has a very strong antioxidant activity because it has an IC₅₀ value of <50 ppm.

CONCLUSION

Based on the results of this study, it has been concluded that:

- shallot peel extract (*Allium Cepa L.*) can be formulated into the preparation of gel peel off mask and it meets the requirements of the physical evaluation test on the formula II with an extract concentration of 1%.
- The IC₅₀ results from the preparation of gel peel off mask of shallot peel extract (*Allium Cepa L.*) on the formula II with an extract concentration of 1% takes 29.97 ppm, it has meaning that it is very strong antioxidant activity because it has an IC₅₀ value of <50 ppm.

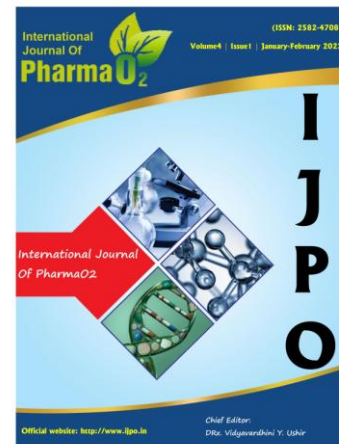
CONFLICT OF INTEREST

The author declares no conflict of interest.

REFERENCES

- Andayani, R. (2008). Dkk. Penentuan Aktivitas Antioksidan, Kadar Fenolat Total dan Likopen Pada Buah Tomat. *Jurnal Sains dan Teknologi*.
- Blois, M. S. (1958). Antioxidant determinations by the use of a stable free radical. *Nature*, 181(4617), 1199-1200.
- Cahyadi, W. (2019). Analisis & aspek kesehatan bahan tambahan pangan.
- Feladita, N. and Junova, H. (2021). Formulasi Sediaan Gel Moisturizer Anti-Aging Ekstrak Kulit Bawang Merah (*Allium cepa L.*) Sebagai Antioksidan. *Jurnal Farmasi Malahayati*, 4(1), 93-106.
- Grace, F. X., Darsika, C., Sowmya, K. V., Suganya, K. and Shanmuganathan, S. (2015). Preparation and evaluation of herbal peel off face mask. *American Journal of PharmTech Research*, 5(4), 33-336.
- Lucida, H., Kalew, R., & Suhelda, S. (2017). Formulasi Masker Peel-off dari Ekstrak Etanol Kulit Buah Asam Kandis (*Garcinia cowa*, Roxb) dan Uji Aktivitas Antioksidannya. *Jurnal Sains dan Teknologi Farmasi Vol*, 19(01).
- Mardiah, N., Mulyanto, C., Amelia, A., Lisnawati, L., Anggraeni, D., & Rahmawanty, D. (2017). Penentuan Aktivitas Antioksidan dari Ekstrak Kulit Bawang Merah (*Allium ascalonicum L.*) Dengan Metode DPPH. *Jurnal Pharmascience*, 4(2).
- Martin, A., J. Swarbrick, dan A. Cammarata. 1993. *Farmasi Fisik: Dasar-dasar Farmasi Fisik dalam Ilmu Farmasetik*. Edisi Ketiga. Penerjemah: Yoshita. Jakarta: UI-Press. Hal. 1176-1182.
- Maysuhara, S. (2009). *Rahasia Cantik, Sehat dan Awet Muda*. Edisi I. Pustaka Panasea, Yogyakarta, 45-47.
- Novita, W. (2013). *Buku Pintar Merawat Kecantikan di Rumah*. Gramedia Pustaka Utama.
- Prabowo, A., & Noer, S. (2020, July). Uji Kualitatif Fitokimia Kulit Bawang Merah (*Allium ascalonicum*). In *SINASIS (Seminar Nasional Sains)* (Vol. 1, No. 1).
- Puspitasari, A. D., Sumantri, L. M., & Fardah, U. J. (2019). Aktivitas Antioksidan Perasan Jeruk Manis (*Citrus sinensis*) Dan Jeruk Purut (*Citrus hystrix*) Menggunakan Metode Abts.
- Rahmawanty, D., Yulianti, N., & Fitriana, M. (2015). Formulasi dan evaluasi masker wajah peel-off mengandung kuersetin dengan variasi konsentrasi gelatin dan gliserin. *Media Farmasi: Jurnal Ilmu Farmasi*, 12(1), 17-32.
- Sari, A. N. (2015). Antioksidan alternatif untuk menangkal bahaya radikal bebas pada kulit. *Elkawnie: Journal of Islamic Science and Technology*, 1(1), 63-68.
- Shai, A., Maibach, H. I., & Baran, R. (2009). *Handbook of cosmetic and skin care (First)*. United Kingdom, Informa UK Ltd First.
- Soebagio, B., & Rusdiana, T. (2007). Pembuatan Gel Dengan Aqupec HV-505 dari Ekstrak Umbi Bawang Merah (*Allium cepa, L.*) Sebagai Antioksidan. In *Jurnal Seminar Penelitian Fakultas Farmasi Universitas Padjadjaran*.
- Tanjung, Y. P., & Rokaeti, A. M. (2020). Formulasi dan Evaluasi Fisik Masker Wajah Gel Peel Off Ekstrak Kulit Buah Naga Merah (*Hylocereus Polyrhizus*). *Majalah Farmasetika*, 4, 157-166.
- Thaib, P. K. P. (2008). Hubungan antara kadar LDL darah pada stroke iskemik fase akut dengan lama perawatan pasien pulang hidup dan pulang meninggal (*Doctoral dissertation*, Faculty of Medicine).

19. Tranggono, R. I. and Latifah, F. (2007). Buku pegangan ilmu pengetahuan kosmetik. *Jakarta: PT. Gramedia Pustaka Utama*, 3(47), 58-59.
20. Voigt, R. and Soewandhi, S. N. (1994). *Buku pelajaran teknologi farmasi*. Gadjra Mada University Press.
21. Widyastuti, N. (2010). Pengukuran aktivitas antioksidan dengan metode CUPRAC, DPPH, dan FRAP serta korelasinya dengan fenol dan flavonoid pada enam tanaman.
22. Winarsi, H. 2007. *Antioksidan Alami dan Radikal Bebas*. Kanisius, Yogyakarta, 283 hlm.
23. Wirajayakusuma, H. (1998). *Hidup Sehat Cara Hembing*.



IJPO is

- **Peer reviewed**
- **Bi-monthly**
- **Rapid publication**
- **Submit your next manuscript at journalpharma02@gmail.com**