Formulation Lip Balm Combination Of Moringa Seed Oil (*Moringa oleifera* L.) As An Emolient And Red Dragon Fruit Extract (*Hylocereus polyrhizus*) As An Natural Color

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Abstract. Indonesia is a tropical country full of sunshine. Sunlight when it hits the skin directly, will cause hyperpigmentation and dryness of the skin, especially the lips. To protect the lips from drying out, a lip balm that has a moisturizing effect can be given. A natural ingredient that has a moisturizing effect is Moringa seed oil (Moringa oleifera L.) because it contains oleic acid and antioxidants. In addition to moisturizing lip balm, the dye can also be added to make it more attractive. The dyes used should not be toxic. Natural ingredients that can be used as natural dyes are red dragon fruit (Hylocereus polyrhizus) which contains anthocyanins. This study aims to formulate lip balm preparations combined with Moringa seed oil (Moringa oleifera L.) as an emollient and red dragon fruit juice (Hylocereus polyrhizus) as a natural dye. Moringa seed oil combined with red dragon fruit juice is formulated in the form of lip balm with different concentrations of Moringa seed oil and red dragon fruit juice, F0 base, F1 13.5% and 6%, F2 15.5% and 8%, F3 17.5% and 10%. Lip balm preparation Physical properties such as organoleptic test, homogeneity, pH test, dispersion test, melting point, and hedonic test. The results showed that increasing the concentration of Moringa seed oil and dragon fruit juice could affect the physical properties, namely lowering the pH value and melting point, increasing spreadability. The hedonic/preferred test with color and texture observations showed different results, namely the most preferred color observation was F3, the most preferred aroma was F0, the most preferred texture was F3. The combination of Moringa seed oil and dragon fruit juice formulated into lip balm preparations produces good physical properties and affects the level of preference of the panelists

Key words: Moringa seed oil, red dragon fruit juice, Lip balm, physical properties test, hedonic test

INTRODUCTION

Indonesia is a tropical country with abundant sunshine throughout the year. Sunlight, if it frequently hits the lips, will cause hyperpigmentation and dryness (Ikhda & Hamidah, 2018). Lips need protection from sunlight that causes free radicals, hyperpigmentation and dryness, namely antioxidants (Ikhda & Hamidah, 2018). Antioxidants are compounds that can inhibit free radicals, thereby preventing negative effects caused by free radicals, such as preventing the lips from becoming black and dry (Puspitasari & Proyogo, 2017). Chapped lips can also cause pain and discomfort. Therefore, cosmetics are needed to protect the lips.

Lip protection cosmetics are cosmetics that protect the lips from sunlight, moisturize, and make them look fresh, prevent dehydration, and are healthier. Lip balm is used to protect and moisturize the lips because it contains vitamins and moisturizers (Muliyawan & Suriana, 2013). The formulation in lip balm is useful for preventing drying and protecting the lips from anything harmful (Ikhda & Hamidah, 2018). Lip balm made from natural ingredients that prioritize lip health and without side effects will be in demand by the public. One natural ingredient that has a moisturizing effect is moringa seed oil (Moringa oleifera L.) and one that has natural coloring is red dragon fruit (Hylocereus polyrhizus). Moringa seed oil (Moringa oleifera L.) contains fatty acids that are ideal for use as a good moisturizer for rough and dry skin (Warra, 2014). In addition to moisturizing ingredients, coloring can also be added to make lip balm more attractive. The addition of coloring must be safe and have no side effects, namely by adding natural coloring.

Natural dyes are dyes obtained from natural materials that are very alternative, renewable, non-toxic, and environmentally friendly (Yernisa, Sa'id & Syamsu, 2013). The use of red dragon fruit (Hylocereus polyrhizus) can be processed for food production, as a base for making cosmetics, and natural dyes (Aryani, Aulia & Muawanah, 2019). Red dragon fruit (Hylocereus polyrhizus) is one of the plants that produces natural dyes because it has a high anthocyanin content in its fruit flesh, namely 88.70 mg/100 mL (Aryani, Aulia & Muawanah, 2019).

METHODS

This is an experimental study conducted at the Pharmaceutical Technology Laboratory of the Cendekia Utama Health College in Kudus from March to April 2021. The materials used in this study were "Kelorina" moringa seed oil, red dragon fruit, lanolin, glycerin, cera alba, nipagin, and oleum cacao. The tools used in this study were: Blender (Miyako), Beaker glass (Herma), Analytical balance (Ohaus), Evaporator dish, Water bath (Eyela SB-1000), glass preparation, Universal pH, Round Glass, Waterbath, Oven (Memmert), UV-Vis Spectrophotometry (Biobase).

Table 1. Formulation of Lip Balm Preparation Combination of Moringa Seed Oil and Red Dragon Fruit Juice

Material	Function	Formulation (%)			
		F0	F1	F2	F3
Moringa seed oil	Emolient	0	13,5	15,5	17,5
Dragon fruit juice	Natural dyes	0	6	8	10
Glycerin	Humectant	5	5	5	5
Cera alba	Base	10	10	10	10
Nipagin	Preservative	0,18	0,18	0,18	0,18
Lanolin	Base	15	15	15	15
Cacao Oil	Base	Ad 100	Ad 100	Ad 100	Ad 100

Information:
F0 = Base
F1 = Moringa seed oil 13.5% and red dragon fruit juice 6%
F2 = Moringa seed oil 15.5% and red dragon fruit juice 8%
F3 = Moringa seed oil 17.5% and red dragon fruit juice 10%

Determination of Red Dragon Fruit

Plant determination was carried out at the Biology Laboratory of Ahmad Dahlan University Yogyakarta to determine the truth of the red dragon fruit plant (Hylocereus polyrhizus) with the aim of avoiding errors in collecting the main research materials and preventing the possibility of mixing with other plants.

Red Dragon Fruit Extraction

The red dragon fruit is peeled, the flesh is cut into small pieces, and then placed in a blender with 80% ethanol added. Blend until smooth, then strain. The resulting red dragon fruit juice is then thickened in a water bath. This juice will be used as a natural dye in the lip balm.

Qualitative Analysis of Anthocyanin

Red dragon fruit juice extract was tested using UV-Vis Spectrophotometry with the aim of determining the compounds contained in red dragon fruit juice.

Making Lip Balm

The cocoa oleum is placed in a steamer dish and melted over a water bath at a melting temperature of around 31-34°C, stirring until all the cocoa oleum is melted. After the cocoa oleum is completely melted, the cera alba is melted in another steamer dish. After melting, it is placed in a dish containing the melted cocoa oleum or melted base. Nipagin, lanolin, and glycerin are added to the melted base while continuously stirring. Then, the moringa seed oil is added while stirring, the temperature is lowered to 45°C , after which the dragon fruit juice is added and stirred until homogeneous. Then the lip balm is placed in the lip balm container provided. Then wait until it solidifies.

Organoleptic Test

Organoleptic testing is a test conducted using the human senses to measure the acceptability of a product. The senses used in this measurement are sight, smell, and taste, as the observed parameters include the color, odor, and taste of the lip balm (Suryono, Ningrum & Dewi, 2018).

Homogeneity Test

The homogeneity test is performed by applying the lip balm preparation to a glass slide and then

attaching it to another glass slide. A homogeneous lip balm preparation is characterized by the absence of lumps, an even texture, and a uniform color (Numberi, Dewipratiwi & Gunawan, 2020).

pH test

The sample was prepared at a 1% concentration, i.e., 1 g of the preparation was weighed and dissolved in 100 ml of distilled water. A universal pH meter was then dipped into the solution. The resulting color was then observed and compared with the available pH stain guide. The pH was matched to the physiological skin pH of 4.5-6.5 (known as pH balanced). (Tranggono & Latifah, 2007).

Melting Point Test

The lip balm preparation was placed in an oven at an initial temperature of 50°C for 15 minutes. The temperature was increased by 1oC every 15 minutes and the temperature at which the lip balm began to melt was observed (Nazliniwaty & Purba, 2017).

Spread Power Test

The spreadability test was carried out by weighing 0.5 g of lip balm and placing it in the middle of a round glass, then covering it with another glass that had been weighed previously and placing a load of 200 g on it for 1 minute, then measuring the diameter (Putri, 2012).

Hedonic/Likeliness Test

This preference test was conducted visually on 30 panelists. The criteria used were adult women, aged 20 and over. Each panelist was asked to visually observe the lip balm preparations. Observations included color, odor, and texture (Permadi, Oktafa & Agustianto, 2018).

Data analysis

Melting point and spreadability data analysis was performed using SPSS 16.0. The physical properties of lip balm were analyzed using hypothesis tests, namely normality and homogeneity tests. Data that were not homogeneous or normally distributed were analyzed using non-parametric tests using Kruskal Wallis and Mann-Whitney statistical analysis. The hedonic/preference test was analyzed using the Two-Way Anova test with the RAK (Randomized Block Design) method.

RESULTS AND DISCUSSION

Red Dragon Fruit Determination Results and Moringa Seed Oil Analysis Certificate

The Moringa seed oil used in this study was Kelorina seed oil produced by PT. Moringa Organik Indonesia, Blora Regency, which has an analysis certificate listed in Appendix 1. Furthermore, red dragon fruit plants taken from the Jollong Pati Garden were carried out at the Biology Laboratory of Ahmad Dahlan University, Yogyakarta. The results of the determination of the red dragon fruit plants used in this study are as follows:

1b – 2b – 3b – 4b – 12b – 13b – 14b – 17b – 18b – 19b – 20b – 21b – 22b – 23b – 24b – 25b – 26b – 27b – 799b – 800b – 801b – 802a – 803b – 804b – 805c – 806b – 807a – 808c – 809b – 810b – 811a – 812b – 815b – 816b – 818b – 820b – 821b – 822b – 824b – 825b – 826b – 829b – 830b – 831b – 832b – 833b – 834a – 835b– 983b – 984b – 986b – 991b – 992b – 993b – 994b – 995d – 1036b Cactaceae 1a – 2b – 4b – 6a Hylocereus (*Hylocereus polyrhizus* (F.A.C.Weber) Britton & Rose).

Extraction of Anthocyanin Pigments from Red Dragon Fruit

Table 2. Results of Thick Extract of Red Dragon Fruit Juice

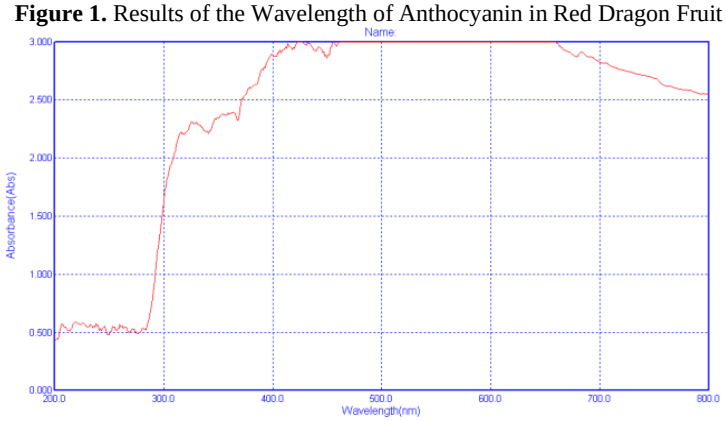
Meat Weight	Solvent	Extract	Color
250 gr	Ethanol 80% 500 mL	25 gr	Purplish Red

Red dragon fruit anthocyanin pigments are obtained through a smoothing process using a blender for 10 minutes to make the dragon fruit smoother and easier to filter and extract the juice. The solvent used in this extraction is 80% ethanol. Ethanol is used because anthocyanins are polar and can dissolve in ethanol (Priska *et al.*, 2018). The use of 80% ethanol is because ethanol is polar so it can attract polar anthocyanins from red dragon fruit juice. Red dragon fruit juice is evaporated over a water bath to remove the solvent at a temperature of 40-50°C. In line with the research of Nasrullah, Husain & Syahrir (2020), a temperature of 40-50°C is a stable temperature for anthocyanin pigments.

Qualitative Analysis of Anthocyanin

Qualitative testing of anthocyanin compounds is seen from the maximum absorbance spectra of red dragon fruit extract. Anthocyanins show absorbance at a wavelength of 465-659 nm. The absorbance spectra of red dragon fruit can be seen in Figure 1.

Figure 1. Results of the Wavelength of Anthocyanin in Red Dragon Fruit



The results of the qualitative analysis test showed that the spectra of red dragon fruit (Hylocereus polyrhizus) dyes were read at a wavelength of 465-659 nm. So it can be concluded that red dragon fruit juice contains several types of natural dyes, namely betacyanin, betaxanthin, and anthocyanin. This is in line with the research of Santoso and Fibrianto (2017) at a wavelength of 534-555 nm indicating the presence of betacyanin and at a wavelength of 480 indicating the presence of betaxanthin, according to research by Priska *et al*. (2018) at a wavelength of 494-510 nm is a type of anthocyanin.

Organoleptic Test

The organoleptic test aims to determine the appearance of the lip balm preparation. The organoleptic test results can be seen in table 2.

Table 3. Organoleptic test results data for lip balm preparations

Observation	F0	F1	F2	F3
Color	Off-white	Pink	Pink	Purplish red
Aroma	Typical Chocolate	Typical Chocolate	Typical Chocolate	Weak Distinctive Odor
Texture	Hard	Hard	Hard	Gentle

Based on the organoleptic test data table, the lip balm preparation produced F0 has a strong chocolate aroma, bone white color and hard texture. While in F1, F2, and F3 the color is not much different because the concentration of dragon fruit juice is not that far, for the aroma in F1 and F2 the aroma is typical of chocolate, F3 the aroma is typical of chocolate is weak this is due to the difference in the concentration of the addition of moringa seed oil and red dragon fruit juice. The higher the concentration of the addition of moringa seed oil and red dragon fruit juice, the less the use of oleum cacao. Because the aroma of the lip balm is obtained from oleum cacao, the less oleum cacao used, the more the typical chocolate aroma is weak. And for the texture when applied slightly different because of the difference in the concentration of moringa seed oil, the resulting lip balm is oily. At a concentration of 13.5% the resulting lip balm is less oily, a concentration of 15.5% is quite oily and a concentration of 17.5% is very oily. This difference in texture is due to the increasing concentration of moringa seed oil, the higher the amount of moringa seed oil added and the less addition of oleum cacao as a base. This is in line with research by Agustiana & Herliningsih (2019) that the higher the concentration of oil and dye, the more it will affect the color, aroma and texture of the lip balm.

Homogeneity Test

The homogeneity test aims to determine whether the lip balm preparation is homogeneous and does not contain coarse grains, because homogeneity is one of the factors that affects quality (Nazliniwaty & Purba, 2017).

Table 4. Homogeneity Test Result Data

Formula	Homogeneity
F0	Homogeneous
F1	Homogeneous
F3	Homogeneous
F4	Homogeneous

The results of the homogeneity test showed that all lip balm formulations were homogeneous. This was indicated by the absence of coarse grains when applied to transparent glass and an even color. This is in line with research by Numberi, Dewipratiwi & Gunawan (2020) that a homogeneous lip balm formulation is characterized by the absence of lumps when applied, a flat structure, and a uniform color. Homogeneity influences therapeutic effectiveness because it is related to the same drug concentration for each application. If the formulation is homogeneous, the active ingredient concentration is assumed to remain constant at the time of application or withdrawal. Lip balm is a preparation that is applied to the therapeutic site.

Each part of the active ingredient must have an equal opportunity to occupy the therapeutic site, and conversely, each part of the therapeutic site must have an equal opportunity to come into contact with the active ingredient. This condition can be achieved if the cream preparation is homogeneous (Swastika, Mufrod & Purwanto, 2013).

pH test

pH measurements are performed to determine whether the resulting product is acceptable to the skin, as this is related to its safety when used. A good pH value for skin is 4.5-6.5 (Tranggono & Latifah, 2013).

Table 5. pH Test Result Data

Formula	pH	Standard	Information
F0	6±0	4,5-6,5	Fulfil
F1	6±0	4,5-6,5	Fulfil
F2	6±0	4,5-6,5	Fulfil
F3	5±0	4,5-6,5	Fulfil

Based on the measurement results of each lip balm preparation, it can be seen that the pH values for each preparation are 6, 6, 6, and 5, respectively, for F0, F1, F2, and F3. Therefore, it can be said that this lip balm preparation is good and does not cause itching and burning on the lips. Referring to the pH value, the four lip balm preparations meet the requirements. According to research by Susanty & Sampepana (2017) stated that the pH of red dragon fruit juice is 3.7, so the more dragon fruit juice added, the more acidic the preparation will be. Based on the results in F3, there was a decrease in the pH of the lip balm. This is because F3 had the highest concentration of lip balm, namely 10%

Melting Point Test

The melting point test was carried out to determine the melting temperature of the lip balm preparation.

Table 6. Melting Point Test Result Data

Formula	Melting Point (ºC)	SNI (ºC)	Information
F0	60 ± 0,47	50-70	Fulfil
F1	56± 0,47	50-70	Fulfil
F2	55± 0,47	50-70	Fulfil
F3	54± 0,47	50-70	Fulfil

The melting point test results for the lip balm preparations at F0, F1, F2, and F3 were 60, 56, 55, and 54°C, respectively. This melting point temperature meets the lip balm requirements, which are between 50-70°C (Pertiwi & Pangestu, 2020). This difference in melting temperature is due to the higher concentration of moringa seed oil and red dragon fruit juice, the less base used, and the lower the resulting melting temperature. This is because moringa seed oil contains fatty acids with a low melting point that are liquid when stored at room temperature (Salimi, Ischak & Ibrahim, 2018).

The results of the statistical test show that the lip balm preparations in F0, F1, F2, and F3 in the data normality and homogeneity test showed that the data was not normal but homogeneous, then continued with the non-parametric Kruskal-Wallis test. shows a P value of 0.029<0.05 which means there is a significant difference.

Between F0, F1, F2, and F3, then continued with the Mann-Whitney test to determine the difference between the formulas. Comparison of F0 and F1, F0 and F2, F0 and F3 has the same P value of 0.043 0.05 means there is no difference this means that the addition of moringa seed oil and dragon fruit juice with different concentrations does not affect the melting point. In line with the research of Agustiana & Herliningsih (2019) that the increasing oil will lower the melting point

Spread Power Test

The purpose of the spreadability test is to determine how well the lip balm preparation spreads on the surface of the skin, because it can improve drug absorption and the speed of release of active substances at the site of application.

Table 7. Data from Spreadability Test Results

Formula	Spread Power (cm)	Standard	Information
F0	5±0	5-7	Fulfil
F1	5,1±0,12	5-7	Fulfil
F2	5,1±0	5-7	Fulfil
F3	5,1±0,09	5-7	Fulfil

The results obtained for F0, F1, F2 and F3 were 5; 5.1; 5.1; 5.1; where all concentrations met the requirements of lip balm preparations because the results of the spreadability test were within the range of good lip balm spreadability, namely 5-7 cm. The difference in lip balm spreadability in F0 and F1, F2, F3 was due to F0 only being a base without the addition of moringa seed oil and red dragon fruit juice so the lip balm texture was harder and difficult to spread. In F1, F2, and F3 with the addition of moringa seed oil and red dragon fruit juice so that the spreadability was higher.

The results of the statistical test show that the lip balm preparations in F0, F1, F2 and F3 in the normality and homogeneity tests showed that the data was not normal and not homogeneous, then continued with the non-parametric Kruskal Wallis test showing a P value >0.05, namely 0.098, meaning there is no significant difference between the spreadability of F0, F1, F2, F3. This means that the addition of moringa seed oil and red dragon fruit juice with different concentrations does not affect the spreadability of the lip balm. This is due to the addition of not too much oil to the lip balm preparation.

Hedonic/Likeliness Test

Hedonic/preference testing was used to determine the panelists' level of preference for lip balm preparations. This hedonic/preference test was conducted visually by 30 panelists, all of whom were female and over 20 years old. Panelists were individuals who subjectively assessed product quality specifications (Indonesian National Standardization, 2006). The panelists conducted the test by observing the color, aroma, and texture of the lip balm preparations. The assessment was as follows don't like the value 1, don't like the value 2, like the value 3, really like the value 4 which is then analyzed using statistics to draw conclusions.

Table 8. Data on the Number of Panelists Evaluating F0

F0	Number of Panelists Evaluating F0			
	1	**2**	**3**	**4**
Color	3	9	14	3
Aroma	1	8	16	5
Texture	2	14	12	2

Table 9. Data on the Number of Panelists Evaluating F1

F1	Number of Panelists Who Assess			
	1	**2**	**3**	**4**
Color	1	6	20	3
Aroma	1	12	16	1
Texture	-	16	12	2

Tabel 10. Data on the Number of Panelists Evaluating F2

F2	Number of Panelists Who Assess			
	1	**2**	**3**	**4**
Color	-	12	15	3
Aroma	4	10	15	1
Texture	-	10	18	2

Tabel 11. Data on the Number of Panelists Evaluating F3

F3	Number of Panelists Who Assess			
	1	**2**	**3**	**4**
Color	-	6	16	8
Aroma	4	10	13	3
Texture	1	10	14	5

Information:
(-): No assessment by panelists
F0 = Base
F1 = Moringa seed oil 13.5% and red dragon fruit juice 6%
F2 = Moringa seed oil 15.5% and red dragon fruit juice 8%
F3 = Moringa seed oil 17.5% and red dragon fruit juice 10%

The results of the hedonic/preference statistical test using the two-way ANOVA test, namely in the observation of the most preferred color and texture, were F3 with a result of 3.07 with a concentration of 17.5% moringa seed oil and 10% red dragon fruit juice. This is due to the high concentration of dragon fruit juice in F3, which makes the color more attractive and is preferred by many panelists. In the aroma observation, the most preferred was F0/base, the result was 2.83. This is because the aromatic ingredient is the lip balm base. In F0, the base is without the addition of moringa seed oil or dragon fruit juice. So the resulting aroma is typical of the base, namely oleum cacao. In the texture observation, the most preferred preparation was F3, the result was 2.77 with a concentration of moringa seed oil of 17.5% and dragon fruit juice of 10%. This is because in F3, the higher the addition of moringa seed oil and red dragon fruit juice reduces the amount of base needed, resulting in a smoother, easier-to-apply lip balm texture. This aligns with Nazhifah's research (2018) a good lip balm preparation is one that can be easily applied or used.

CONCLUSION

Conclusion

Based on the research results, it can be concluded that :

1. Formulation of lip balm preparation with combination of seed oil (Moringa oleifera L.) Moringa as an emollient and red dragon fruit juice (Hylocereus polyrhizus) As a natural dye, it can be formulated into a lip balm preparation with good physical characteristics.
2. Formulation of lip balm preparation with a combination of Moringa oleifera seed oil L.) as an emollient and red dragon fruit (Hylocereus polyrhizus) juice as a natural dye with different concentrations of moringa seed oil and red dragon fruit juice affecting the level of panelist preference.

REFERENCES

Agustiana, Y. D. & Herliningsih (2019). Formulasi sediaan lip balm dari minyak zaitun (*Olive oil*) sebagai emolien dan penambahan buah ceri (*Prunus avium*) sebagai pewarna alami. *Jurnal Herbal dan Farmakologis*, 1(1): 24– 27.

Aryani, T., Aulia, I. & Muawanah, U. (2019). Perbandingan aktivitas antioksidan dan antosianin daging buah naga *hylocereus costaricensis* dan sirup buah naga *hylocereus costaricensis*. *Materi dipresentasikan dalam prodi pendidikan biologi*, 30 Agustus 2019. Yogyakarta: Universitas Ahmad Dahlan.

Ikhda, C. & Hamidah, N. (2018). Uji aktivitas formulasi lip balm dari ekstrak bekatul padi (*Oryza sativa*) sebagai tabir surya. *Artikel Pemakalah Paralel*, 276–283.

Muliyawan, D. & Suriana, N. (2013). *A-z tentang kosmetik*. Jakarta: PT. Elex Media Komputindo.

Nasrullah, Husain, H. & Syahrir, M. (2020). Pengaruh suhu dan waktu pemanasan terhadap stabilitas pigmen antosianin ekstrak asam sitrat kulit buah naga merah. *Jurnal Chemica*, 21(2): 150–162.

Nazhifah, H. (2018). *Formulasi dan Evaluasi Sediaan Lip Balm dari Minyak Biji Anggur* (*Grapeseed Oil*) *Sebagai Pelembab Bibir*. Skripsi diterbitkan. Medan. Fakultas Farmasi Universitas Sumatera Utara.

Nazliniwaty, N. A. & Purba, D. (2017). Lipstick formulation using natural dye from etlingera elatior (jack) r.m.sm. extract. *Journal of pharmaceutics & pharmacology*, 1(2): 87–94.

Numberi, A. M., Dewipratiwi, R. & Gunawan, E. (2020). Uji stabilitas fisik sediaan masker gel dari ekstrak alga merah. *Majalah Farmasetika*, 5(1): 1– 17.

Permadi, R., Oktafa, H. & Agustianto, K. (2018). Perancangan sistem uji sensoris makanan dengan pengujian peference test (hedonik dan mutu hedonik), studi kasus roti tawar, menggunakan algoritma radial basis function network. *Mikrotik: Jurnal Manajemen Informatika*, 8(1): 29–42.

Pertiwi, R. D. & Pangestu, M. (2020). Formulasi dan evaluasi sediaan balsam bibir menggunakan ekstrak bunga kembang sepatu (*hibiscus rosesinensis* l) sebagai pewarna alami. *Archives Pharmacia*, 2(2): 92-101.

Priska, M., Peni, N., Carvallo, L., & Ngapa, Y. D. (2018). Review : antosianin dan pemanfaatannya. *Cakra Kimia*, 6(2): 79–97.

Puspitasari, A. D. & Proyogo, L. S. (2017). Kadar Fenolik total ekstrak etanol daun kersen (*Muntingia calabura*). *Jurnal Ilmiah Cendekia Eksakta*, 1–8.

Putri, A. D. (2012). *Prediksi Komposisi Glyceryl Monostearate dan Cetyl Alcohol Sebagai Emulsifying Agent Menggunakan Aplikasi Desain Faktorial Dalam Sediaan Lip Balm Dengan Pewarna Ekstrak Buah Naga Merah*. Skripsi. Yogyakarta. Fakultas Farmasi Universitas Sanata Darma.

Salimi, Y. K., Ischak, N. I. & Ibrahim, Y. (2018). Karakterisasi asam lemak hasil hidrolisis pada minyak biji kelor (moringa oleifera) dengan metode kromatografi gas-spektroskopi massa. *Jurnal Entropi*, 13(1): 81–87.

Santoso, A. F. & Fibrianto, K. (2017). Pengaruh ekstrak kulit buah naga merah (Hylocereus polyrhizus) terhadap kualitas sosis ayam. *Jurnal Pangan dan Agroindustri*, 5(4): 92–96.

Standarisasi Nasional Indonesia (2006). *SNI 01-2346-2006 : Petunjuk Pengujian Organoleptik dan Sensori.* Jakarta: Kementrian Kelautan dan Perikanan.

Suryono, C., Ningrum, L. & Dewi, T. R. (2018). Uji kesukaan dan organoleptik terhadap 5 kemasan dan produk kepulauan seribu secara deskriptif. *Jurnal Pariwisata*, 5(2): 95–106.

Susanty, A. & Sampepana, E. (2017). Pengaruh masa simpan buah terhadap kualitas sari buah naga merah (*Hylocereus polyrhizus*). *Jurnal Riset Teknologi Industri*, 11(2):76–82.

Swastika, A., Mufrod & Purwanto (2013). Antioxidant activity of cream dosage form of tomato extract (*Solanum lycopersicum* L.). *Traditional Medicine Journal*, 18(3): 132–140.

Tranggono, R. I. & Latifah, F. (2007) *Buku pegangan ilmu pengetahuan kosmetik*. Jakarta: PT. Gramedia Pustaka Utama.

Warra, A. (2014). Research & reviews : journal of pharmaceutics & nanotechnology a review of moringa oleifera lam seed oil prospects in personal care. *Rrjpnt*, 2(3): 31–34.

Yernisa, Said E. G., & Syamsu, K. (2013). Aplikasi pewarna bubuk alami dari ekstrak biji pinang (*Areca catechu* l.) pada pewarnaan sabun transparan. *Teknologi Industri Pertanian*, 23(3).