



Blush-On Compact Powder with Natural Dyes from Ethanol Extract of Dragon Fruit Peel (*Hylocereus lemairei*)

Ni Made Dharma Shantini Suena^{1*}, Rr. Asih Juanita², Ni Putu Udayana Antari³

¹Department of Pharmaceutics, Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, Indonesia.

²Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, Indonesia.

³Department of Social Pharmacy, Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, Indonesia.

Received: November 16, 2022

Revised: April 29, 2023

Accepted: May 25, 2023

Published: May 31, 2023

Correspondence Author:

Ni Made Dharma Shantini Suena
dharmashantini@unmas.ac.id

DOI: [10.29303/jppipa.v9i5.2445](https://doi.org/10.29303/jppipa.v9i5.2445)

©2023 The Authors. This open access article is distributed under a (CC-BY License)



Abstract: Cosmetics are one of the women's basic needs, but several cosmetic products on the market use synthetic dyes such as Rhodamine B, which cause various risks dangerous to health. Natural dyes are non-toxic, renewable, and environmentally friendly, one of which is anthocyanins found in dragon fruit peel. Blush-on is a cosmetic containing a dye that women often use. This study aimed to determine that the dragon fruit peel ethanolic extract can be used as a natural dye in blush-on compact powder preparations with good physical quality. Blush-on was made with various concentrations of dragon fruit peel ethanol extract of 20% (F1), 25% (F2), and 30% (F3). The preparations were observed for organoleptic and homogeneity, pH value, friability, and hedonic test during four weeks of storage, with descriptive data analysis. The results showed that dragon fruit peel extract blush-on did not meet some of the physical quality test requirements for blush-on. It is because the color of the blush-on should be red. However, the color of the preparation is white to brownish, and the preparation is also fragile. The preparation meets the requirements of homogeneity and pH value according to the physiological pH of the skin. It remains stable for four weeks of storage. F1 is the most preferred by panelists based on a preference test for the preparation's shape, color, and odor. Dragon fruit peel extract blush-on has not yet fulfilled its function as a decorative cosmetic to give color to the skin.

Keywords: blush-on; dragon fruit peel extract; hedonic test; physical quality test.

Introduction

Currently, the use of cosmetics to enhance aesthetics is increasing. Cosmetics are necessary, especially for women, and decorative cosmetics will help beautify the face and sharpen cheekbones. Some cosmetic products in the market use synthetic dyes, one of which is Rhodamine B. Synthetic dyes are often used because they are relatively cheaper, have low use levels, can produce solid and bright colors, resulting colors are more attractive and are more stable than natural dyes (Pujilestari, 2016). However, the continuous long-term use of synthetic dyes can cause acne, black spots, and irritation. Skin cancer is the most dangerous disease because synthetic dyes are carcinogenic (Butar-Butar et al., 2022). The use of Rhodamine B in cosmetic preparations including blush preparations has long been

prohibited by the Head of BPOM Regulation since 2015 (Sari et al., 2022), but until now there are still manufacturers who use these synthetic dyes in their cosmetic products. Rhodamine B is widely used in decorative cosmetic preparations. However, there are dangerous risks associated with the use of these synthetic dyes, including irritation to the respiratory tract, causing interference and damage to internal organs, being carcinogenic, and dangerous when in contact with the skin (Rachmawati et al., 2017; Sari et al., 2022; Syamsuri, 2017). Therefore, synthetic dyes require a safe alternative dye.

Natural dyes are alternative dyes that are renewable, easily degraded, non-toxic, and generally, materials derived from nature are environmentally friendly (Riyanti et al., 2022; Yernisa et al., 2013). One of the natural dyes that has the potential to be developed is

How to Cite:

Suena, N.M.D.S., Juanita, R.A., & Antari, N.P.U. (2023). Blush-On Compact Powder with Natural Dyes from Ethanol Extract of Dragon Fruit Peel (*Hylocereus lemairei*). *Jurnal Penelitian Pendidikan IPA*, 9(5), 2325–2331. <https://doi.org/10.29303/jppipa.v9i5.2445>

the anthocyanin found in the peel of dragon fruit (*Hylocereus lemairei*). The red color of dragon fruit peel is produced by anthocyanin pigments such as cyanidin-3-sophoroside and cyanidin-3-glucoside (Nugraheni, 2014). One of the cosmetics that contain dyes that women often use is blush-on. This cosmetic preparation is used to color the cheeks to enhance a fresh impression in facial makeup and correct the face to look more beautiful (Iskandar et al., 2021). Several studies on blush-on formulation with natural dyes, especially from dragon fruit peel, have been conducted (Iskandar et al., 2021; Ramadani et al., 2018; Sari & Fahdi, 2021). However, some of these formulations still use simple bases, different concentrations of dragon fruit peel extract, and olive oil has not been used to add value to the moisturizing effect of preparations and its essential benefits to skin health (Fajriyah et al., 2015; Rahmasari & Puspitorini, 2020; Sari & Setyowati, 2014).

This study aimed to formulate a blush-on using natural dragon fruit peel extract dyes. The blush-on formula used in this study used different excipients from those used in previous studies regarding the quality and quantity of excipients. The advantage of this formula is the use of natural dyes to minimize the adverse effects of synthetic dyes on the skin. In addition, olive oil in this formula is a moisturizer for skin nutrition. Therefore, it is hoped that the results of this study can function as a safe decorative cosmetic with natural dyes and have added value in maintaining skin moisture and nourishing the skin.

Method

Research Tools and Materials

The tools used in this research were a universal pH indicator (Macherey-Nagel, Germany), analytical balance (Ohaus pioneer, PA 224C), 500 g scale (ACIS BC), rotary evaporator (BUCHI R-300), water bath (MEMMERT GmbH+Co., KG, Germany), various laboratory glassware (PYREX), aluminum foil, blush-on container, Elma Sonic®, and Standard Test Sieve 100 mesh (CV. Total Equipment Pharmacy, Indonesia).

The material used in this study was dragon fruit peel extract (20%, 25%, and 30%) from dragon fruit plants obtained from Banjar Batu Sari, Mengwitani Village, Badung Regency, Bali, Indonesia. Other ingredients used were 96% ethanol (PT. Brataco, Indonesia), 1% HCl, Kaolin, Magnesium carbonate, Zinc stearate, Zinc oxide, Oleum cinnamomi, Olive oil, Manihot starch, Propylparaben, Talc (Iskandar et al., 2021; Nurhabibah et al., 2019; Sari & Fahdi, 2021; Sheskey et al., 2020).

Research procedure

The type of this research was experimental research, which aimed to formulate a blush-on compact powder with varying concentrations of natural dyes

from the ethanol extract of dragon fruit peels. Dragon fruit was obtained from Banjar Batu Sari, Mengwitani Village, Mengwi, Badung Regency, Bali, Indonesia. The selected dragon fruit was a ripe fruit marked with a red fruit peel and in good condition. Dragon fruit plants were brought to the Indonesian Institute of Sciences (LIPI) UPT. Plant Conservation Center "Eka Karya" Bedugul Botanical Gardens, Bali, for the determination process.

After the identity of the plants was determined, dragon fruit peel simplicial powder was prepared for extraction. First, the dragon fruit was cleaned in running water, peeled, and then collected. Dragon fruit peel was sorted wet and cut into pieces to reduce their size. The dragon fruit peel was air-dried and powdered using a blender.

The dragon fruit peel extraction process uses an ultrasound-assisted maceration method with the Elma Sonic® tool. One thousand grams of dragon fruit peel simplicial powder was extracted with 96% ethanol solvent and 1% HCl with a volume ratio of 9:1, as much as 1000 ml. The extraction was carried out in triplicate. The extraction results were filtered, and the filtrate was evaporated using a rotary evaporator at a temperature of 40 °C and a speed of 100 rpm, then continued to be concentrated in the water bath until a thick extract was obtained.

Preparation of dragon fruit peel blush-on compact powder using the thick extract of dragon fruit peel started with weighing all the ingredients according to the formula that has been prepared (Table 1). Then make a binding agent by mixing Manihot starch with olive oil and grinding it until homogeneous (mass 1). Kaolin, MgCO₃, and Zinc oxide, which had previously been sieved with a 100-mesh sieve, were put into a mortar and ground until homogeneous. Then add Zinc stearate, Talcum, and propylparaben to the mixture, and continue to grind until homogeneous (mass 2). Mass 1 and mass 2 were then ground using mortar until homogeneous. After that, the natural coloring of dragon fruit peel extract was added to the mortar, and the grinding continued until homogeneous. Oleum cinnamomi was added to the mixture and ground until homogeneous. This powder mixture was then sieved with sieve mesh no. 100. The blush on compact powder is ready to be molded into a container.

Evaluation of the physical quality of the blush on compact powder dragon fruit peel extract was tested for its organoleptic, homogeneity, pH value, and fragility. After the physical quality evaluation, the hedonic test was carried out to determine the best blush-on formulation according to the respondent's preference.

The organoleptic examination was done by observing the shape, smell, and color to determine whether the blush-on compact powder was good (Nurhabibah et al., 2019). The homogeneity test was

carried out by observing whether the extract was evenly mixed in the preparation (Bindharawati et al., 2015). The pH test was carried out to determine the suitability of the blush-on preparation's pH value with the skin's pH and not cause irritation. Tests were carried out using a universal pH indicator stick (Ramadani et al., 2018). The friability test was carried out to determine the hardness of the final preparation according to the requirements of the blush-on preparation. The test is carried out by dropping the preparation on a wooden surface several

times at 8-10 inches. Then the shape of the preparation was observed. Unbroken preparations are declared to meet the requirements (Bindharawati et al., 2015).

The hedonic test was carried out to determine the level of preference of the panelists on the preparations made. In this study, the number of respondents was 20 people. Respondents assessed each blush-on compact powder formula based on shape, color, and aroma (Ramadani et al., 2018).

Table 1. Formulation of Blush-on Compact Powder

Ingredient	Formula (%w/w)			Function
	F1	F2	F3	
Dragon fruit peel extract	20	25	30	Natural dye
Kaolin	16	16	16	Adsorbent
Magnesium carbonate	2	2	2	Adsorbent
Zinc stearate	4	4	4	Thickening agent
Zinc oxide	5	5	5	Opacifier
Oleum cinnamomi	3	3	3	Fragrance
Olive oil	5.5	5.5	5.5	Moisturizer
Manihot starch	2.5	2.5	2.5	Binder, diluent
Propyl paraben	0.1	0.1	0.1	Preservative
Talc	41.9	36.9	31.9	Diluent, dusting powder

*F1 = Formula 1; F2 = Formula 2; F3 = Formula 3

Data analysis

Observations were carried out qualitatively on organoleptic (color, shape, and aroma) and quantitatively on the value of pH, homogeneity, friability, and preference (Hedonic test) conducted from week 0 to week 4. The test data were processed using descriptive statistics.

Result and Discussion

Determination and extraction

The first step in this research was plant determination which was carried out at the Indonesian Institute of Sciences (LIPI) UPT. Plant Conservation Center "Eka Karya" Bedugul Botanical Gardens, Bali, Indonesia. Determining aims to ensure the correctness of the plant species used as research materials so that errors in using materials that impact research results can be avoided (Suena et al., 2017). The determination showed that the dragon fruit plant was derived from *Hylocereus lemairei* (Hook.) Britton & Rose, from the Cactaceae tribe.

Kingdom : Plantae
 Division : Magnoliophyta
 Class : Magnoliopsida
 Order : Caryophyllales
 Family : Cactaceae
 Genus : Hylocereus
 Species : *Hylocereus lemairei* (Hook.) Britton & Rose

At the time of preparation of dragon fruit peel simplicial powder, the results were obtained in the form of dried dragon fruit powder with an attractive color, bright pink (Figure 1). However, the extraction of

dragon fruit peel with 96% ethanol solvent with an ultrasound-assisted maceration method obtained a thick yellow-brown extract with a characteristic odor of dragon fruit peel (Figure 2). The choice of ultrasound-assisted maceration method is due to its extraction speed, compared to conventional maceration. This method is safer, shorter, and increases the amount of yield (Sekarsari et al., 2019). The simplicial powder obtained was 1000 grams and produced a thick extract of 173.8 grams, yielding 17.38% (calculation below). This extract was the natural coloring agent to manufacture blush-on compact powder.

$$r1 = \frac{\text{weight of thick extract}}{\text{weight of simplicial powder}} \times 100\% \tag{1}$$

$$= \frac{173.8g}{1,000g} \times 100\% = 17.38\%$$

The viscous extract obtained was brown, while the desired result was red. The dragon fruit peel extract is red when the maceration process is complete. However, after evaporation of the solvent using a rotary evaporator and continued concentration with a water bath, the dragon fruit peel extract changed color to brown. It is due to the temperature and time used. The increase in temperature in the extraction solvent evaporation process needs to be considered. Evaporation temperature that is too high and the evaporation and concentration time of the extract that is too long and exceeds the optimum limit can cause the loss of compounds that are not heat-resistant in the extract due to the oxidation process (Sekarsari et al., 2019). The color stability of anthocyanins is influenced

by several things, namely temperature, pH, light, and the presence of oxygen (O₂). Anthocyanins are degraded and colorless in light and oxidation (Loppies et al., 2020). Anthocyanins are stable at 50°C and cannot stand above that temperature, so they undergo structural changes, and this causes a change in the color of the extract from red to brown (Loppies et al., 2020; Sekarsari et al., 2019).



Figure 1. Dragon fruit peel simplicial powder



Figure 2. Dragon fruit peel thick ethanol extract

Physical quality evaluation of dragon fruit peel extract blush-on compact powder

Organoleptic tests on blush-on compact powder preparations aim to observe the resulting preparations' shape, color, and aroma using the five senses and whether they follow the original formulation design. In addition, organoleptic tests can also observe the stability of the preparation during storage. Changes in color, shape, and aroma can indicate chemical, physical or microbiological instability in the preparation. The results of the organoleptic tests, as presented in Table 2, show that the dosage form for the three formulas was solid with a more intense color as the levels of dragon fruit peel extract increased from F1 to F3 (Figure 3). All formulas have a distinctive cinnamon aroma due to using *Oleum cinnamomi*. All formulas have stable color, shape, and aroma for four weeks of storage.

Color degradation of anthocyanins is caused by a change in the red flavylum cation to a carbinol base and finally to a colorless chalcone which ends in a brown degradation product (Fathinatullabibah et al., 2014). In addition, it is affected by light because anthocyanins are

unstable in neutral or alkaline solutions, and even in acidic solutions, the color can fade slowly due to exposure to light, so the solution should be stored in a dark place (Armanzah & Hendrawati, 2016). From the results of the blush formulation in this study, the preparation color was not as expected due to the instability of the anthocyanin in the extract. When applied to the skin's surface, the preparation is also less able to leave color, so the purpose of the preparation as a decorative cosmetic was not yet achieved.

The homogeneity test showed that the three formulas were homogeneous meets the requirements of homogeneity, which does not contain coarse grains that can be touched (Ramani et al., 2021). It remained homogeneous after four weeks of storage (Table 3). The dyes can blend or mix well. The condition for good color homogeneity is that the color must be evenly distributed in the powder carrier. The color homogeneity test determines whether the carrier particles or dyes can blend or mix well (Bindharawati et al., 2015).



Figure 3. The appearance of dragon fruit peel blush-on (From left to right, F1, F2, F3)

The pH requirement for an excellent blush-on preparation according to the skin's pH is 4.0-7.0 (Ramadani et al., 2018). The pH test ensures that the preparation will not irritate the skin. pH also affects the preparation's stability and the active ingredients' stability (Cendana et al., 2021). All three formulas have a pH value that meets the requirements, and the pH remains stable for four weeks of storage (Table 4).

Table 2. Organoleptic test results of blush-on compact powder

Formula	Appearance	Week-				Week-4
		0	1	2	3	
F1	Shape	Solid	Solid	Solid	Solid	Solid
	Color	White	White	White	White	White
	Aroma	Cinnamomic	Cinnamomic	Cinnamomic	Cinnamomic	Cinnamomic
F2	Shape	Solid	Solid	Solid	Solid	Solid
	Color	Light brown	Light brown	Light brown	Light brown	Light brown
	Aroma	Cinnamomic	Cinnamomic	Cinnamomic	Cinnamomic	Cinnamomic
F3	Shape	Solid	Solid	Solid	Solid	Solid
	Color	Brown	Brown	Brown	Brown	Brown
	Aroma	Cinnamomic	Cinnamomic	Cinnamomic	Cinnamomic	Cinnamomic

Table 3. The homogeneity test result of blush-on compact powder

Formula	Week-				
	0	1	2	3	4
F1	H	H	H	H	H
F2	H	H	H	H	H
F3	H	H	H	H	H

*H = homogeneous

Table 4. pH test result of blush-on compact powder

Formula	Week-				
	0	1	2	3	4
F1	7	7	7	7	7
F2	7	7	7	7	7
F3	7	7	7	7	7

The friability test aims to determine the hardness of the final preparation following the requirements of compact powder preparations and to determine the resistance to shock or the possibility of the preparation falling. The condition for the fragility of good preparation is that the blush-on preparation must not break or crack (Iskandar et al., 2021). All three blush-on

formulas were fragile when tested for fragility (Table 5). It is possibly due to the low levels of Manihot starch used in the formulation, where this excipient increases the density of the preparation due to its role as a binder (Bindharawati et al., 2015).

Table 5. The friability test result of blush-on compact powder

Formula	Week-				
	0	1	2	3	4
F1	F	F	F	F	F
F2	F	F	F	F	F
F3	F	F	F	F	F

*F = fragile

The Hedonic test determines the panelist's preference for dragon fruit peel blush-on compact powder. The hedonic test was carried out by distributing questionnaires to 20 panelists to express their likes or dislikes for blush-on preparations whose level of preference was measured using a 4-point hedonic scale (Sari et al., 2021; Tayupanta et al., 2018).

Table 6. The hedonic test result of blush-on compact powder

Indicator	Hedonic scale	F1	F2	F3
		(Number of panelists (percentage %))		
Texture	4	6 (30)	3 (15)	3 (15)
	3	13 (65)	9 (45)	6 (30)
	2	1 (5)	8 (40)	11 (55)
	1	0 (0)	0 (0)	0 (0)
Color	4	1 (5)	0 (0)	0 (0)
	3	7 (35)	0 (0)	0 (0)
	2	12 (60)	18 (90)	16 (80)
	1	0 (0)	2 (10)	4 (20)
Aroma	4	3 (15)	2 (10)	2 (10)
	3	4 (20)	5 (25)	5 (25)
	2	13 (65)	13 (65)	13 (65)
	1	0 (0)	0 (0)	0 (0)

*4 = like very much; 3 = like moderately; 2 = dislike slightly; 1 = dislike moderately.

The results obtained in the hedonic test were based on the texture of the preparation with the "like very much" hedonic scale for the F1 formula was 30%, F2 was 15%, and F3 was 15%. The level of preference for the texture of the preparation is not too high due to the lack of density and fragility. Based on the color of the preparation with the "like very much" hedonic scale, 5% of the panelists liked F1, and none on F2 and F3. It is because the color of dragon fruit peel extract as an active ingredient that acts as a natural coloring agent in blush-on preparations, has had an unattractive color from the start, namely brown color due to the instability of anthocyanin compounds in dragon fruit peel which is responsible for giving color. Based on the aroma of the preparation with the hedonic scale of "like very much," 15% of the panelists liked F1, 10% liked F2, and 10% liked F3. From these results, it can be said that the

panelists preferred F1 with the lowest levels of dragon fruit peel extract (20%) in terms of texture, color, and aroma of the preparation (Table 5).

Conclusion

The preparation of blush-on compact powder from dragon fruit peel extract has not met the physical quality requirements in the color, friability, and hedonic tests. It has not fulfilled its function as a decorative cosmetic to give color to the skin. Further research is needed to produce dragon fruit peel extract with a long-lasting color that can be used as a natural dye in decorative cosmetic preparations, one of which is blush-on.

Acknowledgments

Thanks to the Faculty of Pharmacy, Universitas Mahasaraswati Denpasar, for the support and facilities in completing the research.

Author Contributions

Conceptualization, NMDSS; formal analysis, RAJ, NPUA; methodology, NMDSS, NPUA; project administration, NMDSS, RAJ, and NPUA; resources, NMDSS, RAJ, NPUA; supervision, NMDSS; validation, RAJ, NPUA; writing—original draft preparation, NMDSS; writing—review and editing, NMDSS, NPUA. All authors have read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflict of interest.

References

- Armanzah, R. S., & Hendrawati, T. Y. (2016). Pengaruh Waktu Maserasi Zat Antosianin sebagai Pewarna Alami dari Ubi Jalar Ungu (*Ipomoea batatas* L.). *Seminar Nasional Sains dan Teknologi*, November, 1–10. Retrieved from <https://jurnal.umj.ac.id/index.php/semnastek/article/view/724>
- Bindharawati, N., Darsono, F. L., & Wijaya, S. (2015). Formulasi Sediaan Pemerah Pipi dari Ekstrak Kelopak Bunga Rosella (*Hibiscus sabdariffa* Linn.) sebagai Pewarna dalam Bentuk Compact Powder. *Jurnal Farmasi Sains dan Terapan*, 2(2), 33–36. Retrieved from <http://journal.wima.ac.id/index.php/JFST/article/view/721>
- Butar-Butar, M. E. T., Sianturi, S., & Fajar, F. G. (2022). Formulasi dan Evaluasi Blush on Compact powder Ekstrak Daging Buah Naga (*Hylocereus polyrhizus*) sebagai Coloring Agent. *Majalah Farmasetika*, 8(1), 27–43. <https://doi.org/10.24198/mfarmasetika.v8i1.40591>
- Cendana, Y., Adrianta, K. A., & Suen, N. M. D. S. (2021). Formulasi Spray Gel Minyak Atsiri Kayu Cendana (*Santalum album* L.) sebagai Salah Satu Kandidat Sediaan Anti inflamasi. *Jurnal Ilmiah Medicamento*, 7(2), 84–89. <https://doi.org/10.36733/medicamento.v7i2.2272>
- Fajriyah, N., Andriani, A., & Fatmawati, F. (2015). Efektivitas Minyak Zaitun untuk Pencegahan Kerusakan Kulit pada Pasien Kusta. *Jurnal Ilmiah Kesehatan*, 7(1), 1–5. Retrieved from <https://jurnal.umpp.ac.id/index.php/jik/article/view/61>
- Fathinatullabibah, F., Kawiji, K., & Khasanah, L. U. (2014). Stabilitas Antosianin Ekstrak Daun Jati (*Tectona grandis*) terhadap Perlakuan pH dan Suhu. *Jurnal Aplikasi Teknologi Pangan* 3(2), 60–63. Retrieved from <https://jatp.ift.or.id/index.php/jatp/article/view/79>
- Iskandar, B., Ernilawati, M., Tri Agustini, T., Firmansyah, F., & Frimayanti, N. (2021). Formulasi Blush On Stick dengan Zat Pewarna Alami Ekstrak Kering Buah Naga Merah (*Hylocereus polyrhizus* L.). *Cendekia Journal of Pharmacy*, 5(1), 70–80. Retrieved from <https://cjp.jurnal.stikeskendekiautamakudus.ac.id/index.php/cjp/article/view/117>
- Loppies, J. E., Kaherunnisa, K., Rejeki, E. S., Yumas, M., & Sampebara, A. L. (2020). Stabilitas Zat Warna Antosianin Biji Kakao pada Berbagai Kondisi Kopigmentasi. *Jurnal Industri Hasil Perkebunan*, 15(2), 94–104. <https://doi.org/10.33104/jihp.v15i2.6611>
- Nugraheni, M. (2014). *Pewarna Alami, Sumber dan Aplikasinya pada Makanan dan Kesehatan* (1st ed.). Graha Ilmu Yogyakarta. Retrieved from <http://grahailmu.id/produk/pewarna-alami-sumber-dan-aplikasinya-pada-makanan-kesehatan/>
- Nurhabibah, N., Najihudin, A., & Indriawati, D. S. (2019). Formulasi dan Evaluasi Sediaan Perona Pipi (Blush On) dari Ekstrak Etanol Kulit Kayu Manis (*Cinnamomum burmanni* Nees ex BI). *Jurnal Ilmiah Farmako Bahari*, 9(2), 33–44. <https://doi.org/10.52434/jfb.v9i2.518>
- Pujilestari, T. (2016). Review: Sumber dan Pemanfaatan Zat Warna Alam untuk Keperluan Industri. *Dinamika Kerajinan Dan Batik: Majalah Ilmiah*, 32(2), 93–106. <https://doi.org/10.22322/dkb.v32i2.1365>
- Rachmawati, W., Damayanti, S., & Mulyana, A. (2017). Identifikasi Zat Warna Rhodamin B pada Kosmetik Pemerah Pipi dan Eye Shadow dengan Metode KLT dan KCKT. *Jurnal Farmasi Galenika*, 01(02), 71–77. Retrieved from <https://www.e-jurnal.com/2016/12/identifikasi-zat-warna-rhodamin-b-pada.html>
- Rahmasari, E. N., & Puspitorini, A. (2020). Pemanfaatan Belimbing Wuluh (*Averrhoa bilimbi* L.) dan Minyak Zaitun untuk Masker Perawatan Kulit Wajah. *Journal of Beauty and Cosmetology*, 2(1), 57–68. Retrieved from <https://journal.unesa.ac.id/index.php/jbc/article/download/11667/4868>
- Ramadani, F. R., Saisa, S., Ceriana, R., & Andayani, T. (2018). Pemanfaatan Kulit Buah Naga Merah (*Hylocereus polyrhizus*) sebagai Pewarna Alami Kosmetik Pemerah Pipi (Blush-On). *Journal of Healthcare Technology and Medicine*, 4(2), 165–175. <https://doi.org/10.33143/jhtm.v4i2.204>
- Ramani, S., Cahaya Himawan, H., & Kurniawati, N.

- (2021). Formulasi Sediaan Blush-on Ekstrak Kayu Secang (*Caesalpinia sappan* L) sebagai Pewarna Alami dalam Bentuk Powder. *Jurnal Farmamedika (Pharmamedica Journal)*, 6(1), 1-9. <https://doi.org/10.47219/ath.v6i1.117>
- Riyanti, R., Marwoto, P., Priatmoko, S., & Cahyono, E. (2022). The Acid-Base Indicator Paper of Extracted Ethanol from Ashoka Flower (*Ixora coccinea* Linn) with Variations of Solvent and Soaking Period. *Jurnal Penelitian Pendidikan IPA*, 8(4), 1694-1699. <https://doi.org/10.29303/jppipa.v8i4.1494>
- Sari, H., & Fahdi, F. (2021). Formulasi Ekstrak Buah Naga Merah (*Hylocereus polyrhizus*) sebagai Sediaan Pemerah Pipi (Blush On). *Jurnal Penelitian Farmasi & Herbal*, 3(2), 21-28. <https://doi.org/10.36656/jpfh.v3i2.655>
- Sari, N. R., & Setyowati, E. (2014). Pengaruh Masker Jagung dan Minyak Zaitun terhadap Perawatan Kulit Wajah. *Journal of Beauty and Beauty Health Education*, 3(1), 1-7. Retrieved from <https://journal.unnes.ac.id/sju/index.php/bbhe/article/view/7762>
- Sari, S. P., Ikayanti, R., & Widayanti, E. (2022). Kromatografi Lapis Tipis (KLT): Pendekatan Pola Kromatogram untuk Mengkonfirmasi Rhodamin B pada Perona Pipi. *Journal Syifa Sciences and Clinical Research*, 4(2), 494-500. Retrieved from <https://ejournal.ung.ac.id/index.php/jsscr/article/view/14865>
- Sari, S. W., Djamil, R., & Faizatun, F. (2021). Formulation of Blush Preparations using Natural Coloring from Red Beetroot Extract (*Beta vulgaris* L.). *Indonesian Journal of Chemistry*, 21(4), 860-870. <https://doi.org/10.22146/ijc.60414>
- Sekarsari, S., Widarta, I. W. R., & Jambe, A. A. G. N. A. (2019). Pengaruh Suhu dan Waktu Ekstraksi dengan Gelombang Ultrasonik terhadap Aktivitas Antioksidan Ekstrak Daun Jambu Biji (*Psidium guajava* L.). *Jurnal Ilmu Dan Teknologi Pangan (ITEPA)*, 8(3), 267-277. <https://doi.org/10.24843/itepa.2019.v08.i03.p05>
- Sheskey, P. J., Hancock, B. C., Moss, G. P., & Goldfarb, D. J. (2020). *Handbook of Pharmaceutical Excipients* 9th ed. Pharmaceutical Press and American Pharmacist Association. Retrieved from <https://www.pharmpress.com/product/9780857113757/excipients>
- Suena, N. M. D. S., Antari, N. P. U., & Cahyaningsih, E. (2017). Physical Quality Evaluation Of Body Butter Formulation From Ethanol Extract Of Mangosteen (*Garcinia mangostana* L.) Rind. *Jurnal Ilmu Kefarmasian Indonesia*, 15(1), 63-69. Retrieved from <http://jifi.farmasi.univpancasila.ac.id/index.php/jifi/article/view/455>
- Syamsuri, S. (2017). Analisis Kandungan Rhodamin B sebagai Pewarna pada Sediaan Lipstik Impor yang Beredar di Kota Makassar. *Jurnal Farmasi UIN Alauddin Makassar*, 5(1), 40-45. Retrieved from <https://garuda.kemdikbud.go.id/documents/detail/2754564>
- Tayupanta, T. de los Á. M., Espadero, M., Mancheno, M., Peña, S., Uguña, A., Álvarez, S., & Vega, M. A. (2018). Sensory analysis of cosmetic formulations made with essential oils of *Aristeguietia glutinosa* (matico) and *Ocotea quixos* (ishpingo). *International Journal of Phytocosmetics and Natural Ingredients*, 5(5), 1-5. <https://doi.org/10.15171/ijpni.2018.05>
- Yernisa, Y., Gumbira-Sa'id, E., & Syamsu, K. (2013). Aplikasi Pewarna Bubuk Alami dari Ekstrak Biji Pinang (*Areca catechu* L.) pada Pewarnaan Sabun Transparan. *Jurnal Teknologi Industri Pertanian*, 23(3), 190-198. Retrieved from <https://journal.ipb.ac.id/index.php/jurnaltin/article/view/7908>