JFAPS-FULL PAPER DIAH INDAH

by Diah Indah

Submission date: 10-Sep-2022 08:35AM (UTC+0700)
Submission ID: 1896288490
File name: JFAPS-FULL_PAPER_DIAH_INDAH.docx (132.49K)
Word count: 2373
Character count: 12363

Optimization of the Mixing of Hibiscus Flower Extract as a Lipbalm Color with Variations in Concentration

Diah Indah Kumala Sari*[1], Fransisca Dita Mayangsari[1], Elasari Dwi Pratiwi[1]

[1] Department of Pharmacy, Health Science Faculty, Universitas Muhammadiyah Lamongan, Jawa Timur, Indonesia, 62211

*Email: diah_indah_kumala_sari@umla.ac.id

ABSTRACT

Hibiscus rosa sinensis L. are widely used by the community to decorate the garden because of their splendor. In addition, hibiscus flowers have antioxidant which functions as an antioxidant to free radicals and anthocyanin flavonoids as a natural r4 color. This natural dye can be obtained by extracting hibiscus flowers through maceration using 96% ethanol as solvent. The purpose of this study was to determine the effectiveness of mixing hibiscus flower extract with a fat base with varying levels. Process extract hibiscus flowers with petals with blended until smooth then added ethanol 96% (1 liters) and stirred 30 minutes. Filtrate result is taken and then plac2 in a porselen dish and put in a oven 60ºC for 1 day. Four formulas were made by varying levels of hibiscus flower extract: F1 (0%), F2 (2%), F3 (4%) and F4 (6%). Physical evaluation included organoleptic, homogeneity, dispersibility, pH and qualitative tests for identification of anthocyanins. Hibiscus flowers were obtained from Sendang Rejo Village, Lamongan Regency. The results of the organoleptic, homogeneity, dispersion, pH and identification of anthocyanins evaluations were then analyzed descriptively. The data from the organoleptic test indicated that F1 had an odorless white color, while F2, F3, and F4 had a red and white color with a distinctive hibiscus flower aroma. The homogeneity test showed that F1 had good homogeneity while F2, F3, and F4 were not homogeneous (heterogeneous). The spreadability test on the four formulas did not fall within the range of requirements, namely 5 cm-7 cm with an average value of 3.53 but this was related to several significant reasons. The pH test results matched the requirements for topical preparations, namely 4.5-6.5 with an average value of 5.075. Hibiscus flowers extract obtained through the maceration method with 96% ethanol could not give a homogeneous red color from the anthocyanin substance. Physical evaluation and anthocyanin identification test obtained good results. The results of the characteristic evaluation show that the organoleptic test and homogeneity test does not meet the standard requirements set by the Indonesian cosmetic codex.

Key words: Anthocyanin; Hibiscus flowers; Lip balm; Physical Evaluation

1. Introduction

In the 5.0 era, cosmetics is a mandatory thing for toddlers to the elderly, both men and women. Cosmetics is growing rapidly competing with drug and herbal medicine industry. Cosmetics is divided into two: (1) decorative cosmetics such as lipstick, eyeshadow, blush, eyebrow pencil, and hair dye and (2) skin care cosmetics include day cream, night cream, bath soap, shampoo, deodorant, and lip balm.

Lip balm is a semi-solid preparation included in the cerata class with a fat base. It is used to moisturize lips and prevent chapped lips due to exposure to sunlight, dust, and pollution which causes damage to the lip skin layer. Lip balm is used to regenerate dry and rough skin cells. Lip balm is occlusive which can retain lip moisture. If the lips look rough, cracked, black and uneven in color, it can lead to a decrease in self-confidence [11] . Therefore, lip care must be carried out intensely, both using lip scrubs and lip balms to beautify and increase self-confidence. The formula used in the manufacture of lip balm must be standardized in the

Indonesian Cosmetics Codex, both active ingredients and excipients. Basically, the character of lip balm is similar to lipstick because it has a fat or wax base which is used as a moisturizer. However, lip balm has emollient properties and is colorless when applied to the lips. Cosmetic active ingredients are divided into two, namely herbal and synthetic. The development of the cosmetic industry currently refers to herbal preparations which have a high selling value with halal status. One of the plants that can be used as an active substance in lip balm preparations is Hibiscus flowers. Hibiscus flowers with Latin name *Hibiscus Rosa Sinensis* L. has a beautiful ornament with red color when blooming. It grows widely in the world including Southeast Asia and India. This plant contains flavonoid anthocyanins which are widely used as food coloring and cosmetics.

Therefore, this study was conducted to obtain concrete parameters using safe natural ingredients for mixing fat-based lip balm preparations with Hibiscus flowers extract.

2. Methods

2.1 Tools and Materials

The tools used were analytical balance (Shimadzu ATX224), water bath, porcelain cup, beaker glass, lip balm pot, oven (UN55 Memmert), and watch glass. The ingredients were Hibiscus flowers, 96% ethanol, cera alba, Vaseline album, lanolin, propylene glycol, nipagin, Butylene Hydroxy Toluene (BHT), Rose oil, Virgin Coconut Oil (VCO).

2.2 Sample Preparation

Sample Preparation and Maceration Hibiscus flowers were peeled off the petals and then placed on a tray, covered with a black cloth and aired to dry. The flowers were blended until smooth and sieved to remove the finer parts. Then, the flowers were put into 1 liter jar. 96% ethanol was added, and then stirred for 30 minutes and tightly closed at room temperature. Then, the flowers were stirred for 10 minutes and filtered. The filtrate was taken. Next, the porcelain dish was placed in the oven at 60ºC for 3 (three) days.

2.2.1 The Formulation of Hibiscus flowers extract lip balm

The preparation of lip balm hibiscus flower extract was made for 4 (four) formulas: F1 (0%), F2 (2%), F3 (4%) and F4 (6%). BHT was dissolved into VCO in a glass beaker, then added to the mixture of cera alba, lanolin, and Vaseline album which was being melted on a water bath and stirred homogeneously (C1). Then, the aqueous phase of nipagin and propylene glycol homogeneously (C2) were mixed. C2 was mixed with C1 homogeneously and then hibiscus flower extract was added and mixed until smooth. The preparation was placed in a pot and evaluated.

Ingredients	Functions	Formula (%)			
		1	2	3	4
Hisbiscus Flowers Extract	Active ingredient (anthocyanin)	0	2	4	6
Propylene Glycol	Cosolvent	10	10	10	10
Methyl hydroxy benzoate	Preservative	8	8	8	8
Butyl hydroxy toluene	Antioxidant	0.1	0.1	0.1	0.1
Lanolin	Emolien	10	10	10	10
Vaselin alba	Fat base	15	15	15	15
Cera alba	Fat base	15	15	15	15
Rose oil	*Fragrance*	0.05	0.05	0.05	0.05
Virgin coconut oil	Fat base	to 20	to 20	to 20	to 20

2.3 Evaluation of Hibiscus Flower Extract Lip Balm

a) Organoleptic test

The preparation of hibiscus flower extract lip balm was evaluated visually with parameters of texture, color, and aroma [5].

b) Homogeneity test

A total of 0.5 gram of the preparation was placed on a glass object and then covered using a deck glass and observed under a microscope with a magnification of 40x [5].

c) Spreadability test

A total of 0.5 gram of the preparation was placed on a ballast glass then covered with a glass and measured the diameter of the distribution area. After 1 (one) then add the ballast, let stand for 1 minute and measure the diameter of the distribution area until the preparation is constant and does not expand anymore [5].

d) pH Test

A total of 1 gram of the preparation was put in a glass beaker and added 10 ml of CO2-free aqua. Then, pH meter was inserted into the preparation and waited for the value to appear and stabilize [5].

3. Results

This study used hibiscus flowers extract which was formulated into four: F1 (0%) F2 (2%) F3 (4%) and F4 (6%). The results of the hibiscus flower extract can be seen in Figure 1, while the formula results can be seen in Figure 2. Organoleptic evaluation is in table 1. Homogeneity, spreadibility and ph evaluation is in table 2.

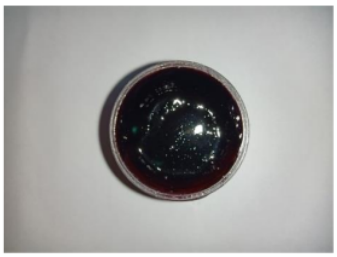

Figure 1. Hibiscus flower extracts

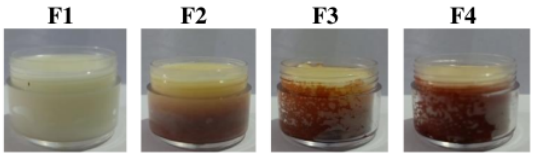

Figure 2. The Preparation of Hibiscus Flower Extract Lip balm

Table 1. Results of organoleptic physical evaluation

Lip balm formula	Form	Color	Odor
F1	Cerata	White	No odor
F2	Cerata	Red mixed white	Poor smell of Hibiscus Flowers
F3	Cerata	Red mixed white	Moderate Smell of Hibiscus Flowers
F4	Cerata	Red mixed white	Strong smell of Hibiscus Flowers

Table 2. The results of the physical evaluation of homogeneity, spreadibility, and pH

Parameters	F1	F2	F3	F4
Homogeneity	Homogeneous	No Homogeneous	No Homogeneous	No Homogeneous
Spreadability	2.75 cm	3.4 cm	3.85 cm	4.15 cm
pH	4.6	5.1	5.3	5.3

4. Discussion

Hibiscus flower extract has chemical components of flavonoids, citric acid, tartaric acid, cyclopropenoids, flavonoid glycosides, hibiscetine, malic acid and anthocyanin pigments with pelargonidin types [2,3]. To date, more than 540 types of anthocyanins can give blue, red, and purple colors [4]. During the maceration process, temperature and storage can damage anthocyanin pigments, although their degradation is not affected by oxygen but is strongly influenced by temperature accumulation. The opening of the ring and the degradation of anthocyanins are factors that cause color changes [7].

The organoleptic results showed that F1 was white while F2, F3, and F4 were red mixed with white. A part from their bright and attractive colors, their solubility is also quite high in water [1,8]. The texture of F1 looked drier than F2, F3 , and F4 because F1 did not have an antioxidant which functioned as a moisturizer. There was no aroma caused by F1 because there was no active ingredient of hibiscus flower extract, while F2, F3, and F4 had a distinctive strong hibiscus flower aroma. The aroma comes from the refreshing acid compound in hibiscus flowers [6].

The results of the homogeneity evaluation showed that the preparation of F1 had a homogeneous composition. This is because cera alba can be used to increase the melting point value and is a good binder in this formula. F2, F3, and F4 had a heterogeneous composition of a mixture of red (anthocyanin substances) from hibiscus flower extract and white (fat base) derived from cera alba [9]. This is because the withdrawal of hibiscus flower extract using ethanol as a polar solvent cannot be mixed with the cera alba base, namely fat (non polar). This results in the inability to mix the extract and the fat base of the formula. F1 is well mixed because there is no mixing between polar and non-polar compounds.

The evaluation of dispersion determines how widely the hibiscus flower extract lip balm preparation can spread when applied. Good

dispersion for topical preparations is 5-7 cm as much as 1 gram. The results of the average dispersion test of 3.53 cm can be concluded that it does not meet the standard requirements because the preparation is weighed only 0.5 grams instead of 1 gram, so the number of preparations used affects the spreadability of the preparation. In addition, the semi-solid texture such as cerata in the formula affects the spreadability to be narrower due to the absence of the aqueous phase.

Evaluation of pH determination of hibiscus flower extract lip balm that is applied to the lips is expected to be in the range of 4.5-6.5 because it is the pH of a topical preparation. Topical preparations that have too acidic pH will cause sensitive and red skin, while if it is too alkaline it will cause eczema and cracked skin, so it is necessary to have a specific pH in order to prevent skin damage due to inappropriate pH values. The chemical structure and pH of anthocyanins from hibiscus flower extract have different pH values depending on the conditions. Neutral pH (pH 7) does not give color. Acidic pH (pH<3) is red and alkaline pH (pH>10) is blue [4].

The results obtained are acceptable in accordance with the requirements of the Indonesian Cosmetics Codex. However, for uneven color results, a mixing process with better heating needs to be carried out.

5. Conclusions And Suggestions

It can be concluded that the hibiscus flower extract using 96% ethanol solvent through the maceration method cannot be used as a lipbalm formulation based on cera alba fat. The results of the characteristic evaluation show that the organoleptic test and homogeneity test does not meet the standard requirements set by the Indonesian cosmetic codex.

In order to obtain more significant results, it is necessary to conduct further research on mixing hibiscus flower extract with penoxyethanol, methanol or other non-polar solvents to see the homogeneity of the preparation.

References

1. Vilas Boas AC, Henrique P de C, Lima LC de O, Neto AD. and Organic Acids 480 Antioxidant Activity , Boas , Content of Grape Juices Produced in Southwest of Minas. Ciência e Agrotecnologia [Internet]. 2014;38(5):480–6. Available from: http://www.scielo.br/pdf/cagro/v38n5/a07v38n5.pdf

2. Sáyago-Ayerdi SG, Arranz S, Serrano J, Goñi I. Dietary fiber content and associated antioxidant compounds in Roselle flower (Hibiscus sabdariffa L.) beverage. J Agric Food Chem. 2007;55(19):7886–90.

3. Badreldin HA, Naser Al W, Gerald B. Phytochemical, pharmacological and toxicological aspects of Hibiscus sabdariffa L.: a review. Phyther Res. 2005;19(5):369–75.

4. Riniati R, Sularasa A, Febrianto AD. Ekstraksi Kembang sepatu (Hibiscus Rosa Sinensis L) Menggunakan Pelarut Metanol dengan Metode Sokletasi untuk Indikator Titrasi Asam Basa. IJCA (Indonesian J Chem Anal. 2019;2(01):34–40.

5. Zhelsiana DA, Pangestuti YS, Nabilla F, Lestari NP, Wikantyasning ER. Formulasi dan Evaluasi Sifat Fisik Masker Gel Peel-Off Lempung Bentonite. 4 th Univesity Res Coloquium [Internet]. 2016;42–5. Available from:

http://hdl.handle.net/11617/7730

6. Amperawati S, Hastuti P, Pranoto Y, Santoso U. Efektifitas Frekuensi Ekstraksi Serta Pengaruh Suhu dan Cahaya Terhadap Antosianin dan Daya Antioksidan Ekstrak Kelopak Rosella (Hibiscus sabdariffa L.). J Apl Teknol Pangan. 2019;8(1):38–45.

7. He XL, Li XL, Lv YP, He Q. Composition and color stability of anthocyanin-based extract from purple sweet potato. Food Sci Technol. 2015;35(3):468–73.

8. Inggrid HM, Jaka, Santoso H. Natural red dyes extraction on roselle petals. IOP Conf Ser Mater Sci Eng. 2016;162(1).

9. Sampebarra AL. Mempelajari Kestabilan Dan Efek Iritasi Sediaan Lipstik Yang Diformulasi Dengan Lemak Kakao. J Ind Has Perkeb. 2016;11(2):97–103.

10. Dyah P, Ratih, Pangestu M. Archives Pharmacia Volume 2 Nomor 2. Formulasi dan Eval sediaan Balsam Bibir Menggunakan ekstrak Bunga Kembang Sepatu (Hibiscus rose Sin L) sebagai Pewarna Alami. 2020;2.

11. Kadu M, Vishwasrao S, Singh S. Review on Natural Lip Balm. International Journal of Research in Cosmetic Science. Int J Res Cosmet Sci. 2014;5(1):1–7.

JFAPS-FULL PAPER DIAH INDAH

ORIGINALITY REPORT

6%	5%	2%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	journal.uad.ac.id Internet Source	2%
2	ro.scribd.com Internet Source	1%
3	Sri Wahyuni Nasution, Stepfany Monica Helmin, Jessyca Sembiring S, Daniel Arswendo, Novia Fransiska Br S, Ronel Polin Sihombing. "Phytochemical and Antibacterial Analysis of Mangkokan Leaf Extract Against Salmonella typhimurium Bacteria", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 Publication	1%
4	ejurnal.litbang.pertanian.go.id Internet Source	1%
5	Maielen Teixeira Gonçalvez, Aline Santos Vieceli, Tayane Cristina Rigon, Guilherme Bertolino et al. "Electromyography in muscle activation lumbar region in a comparison between manual therapy and	<1%

photobiomodulation associated with kinesiotherapy in individuals with low back pain", ABCS Health Sciences, 2022
Publication

6	e-jurnal.stikes-isfi.ac.id Internet Source	<1%
7	repository.petra.ac.id Internet Source	<1%
8	www.ijritcc.org Internet Source	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		