Strada International Conference on Health, 31-36
Volume 1 Number 1 July 2024
ISSN xxxx-xxxx (Print) xxxx-xxxx (Online)

VARIATION OF EMULGATOR CONCENTRATION IN BODY LOTION PREPARATION FROM TOMATO FRUIT JUICE (LYPERSICUM ESCULENTUM L.) AND OLIVE OIL) ON PHYSICAL TEST

Juvita Herdianty[1], Arif Wijayanto[2]
[1,2] Department of Pharmacy, Institut Ilmu Kesehatan STRADA Indonesia, Kediri, Indonesia
Email: juvitaherdianty@strada.ac.id

ABSTRACT

Skin care is becoming increasingly popular for both men and women to maintain healthy skin. The skin protects the body from the outside world because it is the outermost tissue of the body. Therefore, the skin is very easily exposed to sunlight and dangerous environmental elements, this causes damage and reduction in collagen and can also cause damage to the skin, the skin looks dark, scaly, dry and can also cause wrinkles if we don't look after or care for the skin. (A. Wilapangga and D. Rahmat, 2023). Tomatoes are a natural ingredient that has various benefits, including being used to maintain healthy skin. Apart from being used as vegetables, fruit and medicine, tomatoes themselves contain many benefits. Lycopene, which is a substance with high antioxidant activity, is found in many tomatoes (N. Product, 2021). Olive oil also contains a number of vitamins such as vitamins A, D, and E as well as a number of minerals. The vitamin E content is useful for treating skin damage because it contains tocopherol compounds which have antioxidant activity, which can protect from free radicals. (Mursyid AM, 2017). The aim of this research was to determine variations in emulsifier concentration using Tween 80 and Span 80 in tomato juice (Solanum lypersicum L.) body lotion preparations with variations in the best emulsifier concentration. The work procedure consists of taking samples, identifying plants (tomatoes), processing samples, making lotion preparations, evaluating lotion preparations including organoleptic tests, homogeneity tests, pH tests, spreadability tests, adhesion tests, stability tests. The research results show that tomato juice can be formulated into a body lotion formulation using an emulsifier. The test results on F1, F2 and F3 preparations meet the requirements for organoleptic tests, homogeneity tests, pH tests in accordance with SNI standards, namely 4.5-8, spreadability tests with a range of 5-7 cm, and emulsion type tests. However, in the F2 dispersion test, the dispersion is wider than F1 and F3.

Keywords: span80; tomatoes; tween80

BACKGROUND

Skin care is becoming increasingly popular for both men and women to maintain healthy skin. Skin protects the body from the outside world because it is the outermost tissue of the body. Therefore, the skin is very easily exposed to sunlight and dangerous environmental elements, this causes damage and reduced collagen and can also cause damage to the skin, the skin looks dark, scaly, dry and can also cause wrinkles if we don't pay attention. after or caring for the skin. (A. Wilapangga and D. Rahmat, 2023).

Tomatoes are a natural ingredient that has various benefits, including being used to maintain healthy skin. Apart from being used as a vegetable, fruit and medicine, tomatoes themselves contain many benefits. Lycopene, which is a substance with high antioxidant activity, is often

found in tomatoes (N. Product, 2021). Olive oil also contains a number of vitamins such as vitamins A, D, and E as well as a number of minerals. The vitamin E content is useful for treating skin damage because it contains tocopherol compounds which have antioxidant activity so they can protect against free radicals. (Musyid AM, 2017).

METHODS

Work procedures consist of taking samples, identifying plants (tomatoes), processing samples, making lotion preparations, evaluating lotion preparations including organoleptic tests, homogeneity tests, pH tests, spreadability tests, adhesion tests, stability tests.

RESULTS

The results of the research show that tomato juice can be formulated into a body lotion formulation using the emulsifier Span 80 and Tween 80. The test results on preparations F1, F2 and F3 meet the organoleptic test requirements, observations from the organoleptic test show that the body lotion preparation only makes tomatoes (Lypersicum Esculentum L.) produced in F, F2 and F3 has the same form, namely semisolid lotion, peach color, with a typical tomato smell. The difference in emulsifier concentration used in F1 with an emulgator concentration of Tween 80 5% and Span 80 10%, F2 with an emulgator concentration of Tween 80 and Span 80 10% and F3 Tween 80 and Span 80 15% did not affect the organoleptic test results. The results of the homogeneity test on F1, F2 and F3 after measuring the lotion preparation shown on the object glass did not feel the presence of solid materials or coarse grains, this shows that the mixing process of each ingredient in the oil phase and air phase was good. The results of the pH test according to SNI standards are 4.5-8, the spreadability test is in the range of 5-7 cm, namely the results of the spreadability test on F1 with an emulgator tween concentration of 80-5% and a span of 80-10% produce an average value of spread diameter of 5 .67 cm, in F2 with a concentration of tween 80 emulsifier and 10% span 80, it produces an average value of spreading diameter of 6.28 cm and F3 tween 80 emulgator and 15% span 80 produces an average value of spreading diameter of 6.79 cm. The larger The spreadability of the lotion means the release of the desired therapeutic effect on the skin is faster. The difference in pH test results is influenced by the amount of concentration of Tween 80 and Span 80 emulsifier added to the tomato fruit juice (Lypersicum Esculentum L.) body lotion preparation. and F3 body lotion preparation of tomato fruit juice (Lypersicum Esculentum L.) meets the spreadability test requirements.

The organoleptic test results of body lotion from tomato juice and olive oil can be seen in the table 1.

Table 1. Organoleptic Test Results

Organoleptic Test	F1	F2	F3
Color	Peach	Peach	Peach
Smell	Olives and tomatoes	Olives and tomatoes	Olives and tomatoes
Form	Semi solid	Semi solid	Semisolid
Texture	Soft	Soft	Soft

Explanation
F1: Tween 80 dan Span 80 5 %
F2:Tween 80 dan Span 80 10 %
F3:Tween 80 dan Span 80 15 %

The results of the pH test using a pH meter are in table 2. Based on the results of the pH test, values were found that fall into the range, namely 4.5 - 8 for both F1, F2 and F3.

Table 2. pH test Results

Replication	F1	F2	F3
Replikasi 1	6,1	6,3	6,7
Replikasi 2	6,1	6,4	6,6
Replikasi 3	6,1	6,2	6,6
average	**6,1**	**6,3**	**6,6**

Explanation
F1: Tween 80 dan Span 80 5 %
F2:Tween 80 dan Span 80 10 %
F3:Tween 80 dan Span 80 15 %

Based on the results of the homogeneity test on the body lotion preparation, it is presented in table 3.

Table 3. Homogeneity Tes

Formulation	Replication	Result
F1	1	Homogeneous
F2	2	Homogeneous
F3	3	Homogeneous

Explanation
F1: Tween 80 dan Span 80 5 %
F2:Tween 80 dan Span 80 10 %
F3:Tween 80 dan Span 80 15 %

The results of the spreadability test on body lotion preparations using the tween 80 and span 80 emulsifiers are presented in table 4, showing that they meet the standard, namely 5-7 cm.

Table 4. Spreadability Test

Formulation	Replication	Load power	Result
F1	1	100 gram	5,35
	2		5,30
	3		5,37
average			**5,34**
F2	1	100 gram	5,68
	2		5,58
	3		5,69
average			**5,65**
F3	1	100 gram	6,72
	2		6,70
	3		6,68
average			**6,70**

Explanation
F1: Tween 80 dan Span 80 5 %
F2:Tween 80 dan Span 80 10 %
F3:Tween 80 dan Span 80 15 %

Based on the results of the emulsion type test in the body lotion preparation, it is presented in table 6.

Table 6. Result Emulsion Type

Formulation	Replication	Result	Emulsion Type
F1	1	The light is on	O/W
	2	The light is on	O/W
	3	The light is on	O/W
F2	1	The light is on	O/W
	2	The light is on	O/W
	3	The light is on	O/W
F3	1	The light is on	O/W
	2	The light is on	O/W
	3	The light is on	O/W

Explanation
F1: Tween 80 dan Span 80 5 %
F2:Tween 80 dan Span 80 10 %
F3:Tween 80 dan Span 80 15 %

DISCUSSION

The organoleptic test is carried out by visually observing the shape, color and odor of the preparation. The results of observations from organoleptic tests showed that the body lotion preparation of ethanol extract of Moringa leaves (Lypersicum esculentum L.) produced in F1, F2 and F3 had the same form, namely semisolid lotion, light green in color, with a distinctive smell of Moringa leaves. The difference in emulgator concentration used in FI with emulgator concentrations of Tween 80 and Span 80 5%, F2 with emulgator concentrations of Tween 80 and Span 80 10% and F3 with emulgator concentrations of Tween 80 and Span 80 15% did not affect the organoleptic test results.

The homogeneity test is carried out to determine how homogeneous or evenly mixed the ingredients in the lotion preparation are. Homogeneity is indicated that all lotion preparations do not show any coarse grains in the preparation when applied to a glass object, if the lotion preparation is not homogeneous, its use on the skin, the active substance contained in the lotion preparation that has been made is not dispersed evenly so that it does not achieve the desired effect. . Homogeneity in an emulsion system is influenced by the mixing technique used and the tools used in the emulsion making process (Noer and Sundari, 2016). The results of the homogeneity test on F1, F2 and F3 after observing the lotion preparation proved that on the glass object there was no solid material or coarse grains felt, this shows that the mixing process of each ingredient in the oil phase and water phase was good. The difference in emulsifier concentration used in F1 with an emulgator concentration of Tween 80 and Span 80 5%, F2 with an emulgator concentration of Tween 80 and Span 80 10% and F3 with an emulgator concentration of Tween 80 and Span 80 15% did not affect the results of the homogeneity test.

The pH test is carried out to determine whether the body lotion produced is acidic or basic. Topical preparations with a pH value that is too acidic can irritate the skin, whereas if the pH value is too alkaline it can make the skin dry and scaly. The standard pH quality requirements for skin moisturizers according to SNI 16-4399-1996 are in the range of 4.5-8.0 (Rahayu, 2016). Based on the results of pH measurements using a pH meter (Mettler Toledo) which has been calibrated first, the electrode is first washed using distilled water, dried and standardized with a pH 4 buffer solution and a pH 7 buffer solution, then the electrode is dipped in body lotion, press the button (Read) on the keypad, the measurement process takes place, wait and see the constant number displayed on the pH meter screen.

The dispersion power test is carried out with the aim of determining whether the active substance can be dispersed evenly or not on the skin so that it can produce an even and maximum therapeutic effect or not (Amatullah, et al., 2017). The specified diameter of the lotion is in the range of 5cm –7cm (Puspita Dewi, 2018). Weigh 1 gram of the body lotion preparation, then place it in the middle of a diameter-scale glass tool to test the spreadability.
On top of the body lotion preparation, another glass or other transparent material is placed and given a certain weight of 50 grams, 100 grams each, left to rest for 1 minute, then the diameter of distribution is recorded. The results of the spreading power test on F1 with an emulgator concentration of tween 80 and span 80 5% produced an average value of spreading diameter of 5.34 cm; F2 with an emulgator concentration of Tween 80 and Span 80 of 10% produces an average value of spreading diameter of 5.65 cm and F3 with an emulgator concentration of Tween 80 and Span 80 of 15% produces an average value of spreading diameter of 6.70 cm. The greater the spreading power of the lotion, the faster the release of the desired therapeutic effect on the skin.
The emulsion type test was carried out using the electrical conductivity method. Testing using the electrical conductivity method is carried out by dipping a pair of electrodes that have been connected to a lamp and a power source into a body lotion preparation of tomato juice (Lypersicum esculentum L.). The light comes on when the electrode is dipped in a lotion type o/o (oil in water) and vice versa the light goes off if the type is o/o (water in oil) (Martin, et al., 1993). This is caused by the dispersing phase of the lotion, namely water, which is a good electrical conductor in conducting electric current. The results of the emulsion type testing that has been carried out show that the light is on at F1, F2 and F3, so the emulsion type of the tomato fruit juice (Lypersicum esculentum L.) body lotion preparation is the o/w type (oil in water) with different concentrations of Tween 80 emulsifier and Span 80 used in F1, F2 and F3 does not affect the emulsion type test results.

CONCLUSION

Based on the results of research on tomato juice body lotion preparations, it can be concluded that the choice of emulsifier can influence several physical tests, including the test value, pH and spreadability test which are not much different and are still within the standard range, while for other physical tests such as organoleptic, homogeneity and the type of emulsion makes no difference.

REFERENCES

Fitriana, R, A, (2015). Optimasi Formula Krim Antibakteri Ekstrak Kulit Buah Manggis (Garcinia Mangostana Linn) Menggunakan Asam Stearat Sebagai Emulgator Dan Trietanolamin Sebagai Alkalizing Agent Dengan Metode Desain Faktorial, Naskah Publikasi, Fakultas Farmasi, Universitas Muhammadiyah Surakarta.

Lypersicum Esculentum. L Pohan, E. (2019). Formulasi Dan Uji Stabilitas Krim Ekstrak Methanol Daun Beluntas (Pluchea indica L.) Dari Kota Benteng Kabupaten Kepulauan Selayar Provinsi Sulawesi Selatan. Jurnal Farmasi Sandi Karsa, 5(1), 57–64.

Mursyid AM. (2017). Evaluasi Stabilitas Fisik Dan Profil Difusi Sediaan Gel (Minyak Zaitun). J Fitofarmaka Indones;4(1):205–211.

N. Product. (2021). "Pengaruh Trietanolamin Dan Asam Stearat Terhadap Mutu Fisik Dan Stabilitas Mekanik Krim Sari Buah Tomat," vol. 04, no. April, pp. 113–122.

N. Makassar, "Kandungan Likopen Buah Tomat (lycopersicum esculentum l .) terhadap Waktu dan Suhu Pemanasan," pp. 28–35.

Nonci, F. Y., Tahar, N., & Aini, Q. (2016). Formulasi dan Uji Stabilitas Fisik Krim Susu Kuda Sumbawa dengan Emulgator Nonionik dan Anionik. Jurnal Farmasi UIN Alauddin Makassar, 4(4), 169–178.

Purwaningsih, S., Salamah, E., & Budiarti, T. A. (2014). Formulasi Skin Lotion dengan Penambahan Karagenan dan Antioksidan Alami dari Rhizophora mucronata Lamk. Jurnal Akuatika, 5(1), 55– 62.

Rowe, R. C., Sheskey, P. J., & Quinn, M. E. (2009). Handbook Of Pharmaceutical Excipients (Sixth Edit). Pharmaceutical Press and American Pharmacist Association.

Rusmin. (2020). Formulasi Dan Uji Mutu Fisik Sediaan Lulur Krim Dari Serbuk Kemiri (Aleurites Moluccana (L.) Willd.). Jurnal Kesehatan Yamasi Makasar, 4(1), 47–57.

Saryanti, D., Setiawan, I., & Safitri, R. A. (2019). Optimasi Formula Sediaan Krim M/A Dari Ekstrak Kulit Pisang Kepok (Musa Acuminata L. Jurnal Riset Kefarmasian Indonesia, 1(3), 225–237.

Simangunsong, F.M.P., dkk. (2018). Karakteristik Krim Ekstrak Kunyit (Curcuma domestica Val.) Pada Berbagai Formulasi. Jurnal Reakayasa dan manajemen Agroindustri, 6(1), 11-21.

Tari, M., Indriani, O. (2023). Formulasi dan Uji Stabilitas Fisik Sediaan Krim Ekstrak Sembung Rambat (Mikania micranta Kunth). Babul Ilmi_Jurnal Ilmiah Multi Science kesehatan, 15(1),192-211.

T. H. E. Effectiveness, O. F. Tomato, and F. Antioxidant, “Indonesian Journal of Global Health Research,” vol. 4, no. 3, pp. 611–620, 2022.

Wilapangga and D. Rahmat, “Formulasi dan Evaluasi Sediaan Gel Nanopartikel Ekstrak Temulawak (Curcuma xanthorrhiza) sebagai Tabir Surya,” vol. 3, no. 1, pp. 26–32, 2023, doi: 10.37311/ijpe.v3i1.18854.