http://ejournal.seaninstitute.or.id/index.php/healt
Jurnal Eduhealt, Volume 13, No. 01 September 2022
ISSN. 2087-3271

The Effectiveness and Stability Test of Moisturizing Cream Extracts of Fruit Peel Papaya (Carica papaya L) and Rambutan Nephelium lappaceum L)

Kartika Sari[1], Abu Dzarrin Al Ghifari[2], Teti Indrawati[3], Shelly Taurhesia[4], Dhanella Cristy[5]
[1,2,5] Program Studi Farmasi, Sekolah Tinggi Ilmu Kesehatan Tarumanagara, DKI Jakarta, Indonesia
[3,]Program Studi Farmasi, Institut Sains Dan Teknologi Nasional, DKI Jakarta, Indonesia
[4]Program Studi Magister Ilmu Kefarmasian, Universitas Pancasila, DKI Jakarta, Indonesia

ARTICLE INFO

Key Word:
Fruit peel, extract, cream, skin, moisturizing

email :
kartikasari.apt22@gmail.com

ABSTRACK

The skin of the fruit that has not been used by humans and other living things so far, has a fairly good nutritional value for the skin. The purpose of this study was to determine the effectiveness and stability of the moisturizing cream. Fruit peel papaya and fruit peel rambutan were extracted respectively using ethanol 70% by maceration method, produced maserate, concentrated using a rotary evaporator. The combination of extracts was made into a cream preparation using the emulsification method. The resulting cream was evaluated for stability and effectiveness in humans. Skin moisture test showed that the increase in skin moisture value occurred in all formulas, where the highest percentage value was seen in F4, namely the initial moisture value of 46.99±3.908 and after 28 days of use it became 58.95±3.792 there was an increase in skin moisture value of 11 ,96, while in F1 as a positive control the results of the skin moisture value before use of 46.98 ± 4.634 and after using for 29 days it became 53.61 ± 4,888 there was an increase in skin moisture value of 6.63. The resulting cream is stable on storage for 3 months at temperatures of 25^0 and 40^0

1. INTRODUCTION

Fruit peel have good nutritional value for humans and other living things, fruit peels have been carried out several studies can be processed into food, medicine and cosmetics (Melliawati, 2015). Skin moisturizers can prevent skin dehydration which causes dryness and cracks in the skin and other bad consequences. Moisturizers are divided into three groups, namely; sugar group (sucrose, dextrose, maltose, fructose), polyol group (glycol, sorbitol, glycerol, mannitol) and salt group (sodium chloride, sodium bromide, potassium chloride) (Sari, 2019).

The content of papaya fruit peel (Carica papaya L.) consists of various types of enzymes, vitamins (A, B1 and C) which are very important to ward off free radicals, minerals (calcium, phosphorus, potassium and iron), 0.5 g protein, fat and carbohydrates 12.20 g (sugars include sucrose, glucose and fructose), flavonoids, alkaloids and phenols. The results of research on ripe papaya skin as an antioxidant, sunscreen and moisturizer (Marliani, 2015). The content of rambutan fruit peel (Nephelium lappaceum L.) includes steroid, terpenoid, phenolic and

flavonoid compounds with the highest content of phenolic compounds, phenolic components from rambutan peel include geranin and corilagin which are flavonoids, and allegic acid from the tannin group. (Hasan, 2018).

Cream is a semi-solid preparation, which is in the form of an emulsion containing the appropriate basic ingredients. Vanishing cream is preferred for daily use because it has the advantage of providing a cooling effect on the skin, not greasy and has good spreading ability (Sari, 2019). Previous research was limited to testing antioxidants from creams containing papaya peel extract and rambutan peel extracts. The results showed that these creams had very strong antioxidant activity when compared to positive control creams containing vitamin C (Sari, 2019). This study aims to continue previous research, namely testing the effectiveness of moisturizers and cream stability

2. METHOD

The tools used in this research are Neraca Analitik (Sartorius), Homogenizer (Daihan), Rotavapor (Buchi), pH meter (Benchtop), Viscometer Brookfield (Tipe RV), oven (Memmert), lemari pendingin (Electrolux) dan *skin analyzer* (Mode-SK-8). The materials used are papaya fruit peel dan rambutan fruit peel (Balitro, Bogor) Gliserin (PT. Pharmaco Aaper), Isopropil miristat (Care Chemical), Steareth-2 (PT. BASF chemical), Steareth-21 (PT. BASF chemical), Setil alkohol (PT. Sigma Aldrich), Metil paraben (PT. Brataco chemical), Propil paraben (PT. Brataco chemical), *Aquadest*, Sudan III dan Biru metil. The monograph of each material has a Certificate of Analysis and a plant determination has been carried out at LIPI Cibinong.

The extraction method was carried out by maceration using ethanol 70% in a ratio of 1:10 after obtaining the maserate then concentrated using a rotary evaporator at a temperature of 40^0-50^0C, and making cream preparations using the mixing and melting method, tested for the effectiveness and stability of the cream. Effectiveness test on humans for 28 days and stability test for 3 months

Table 1. Cream Formula Extracts of Papaya Fruit Peel (*Carica papaya* L.) and Rambutan Fruit Peel (*Nephelium lappaceum* L.)

No	Materials	Quantity (%)				
		F0	F1	F2	F3	F4
1	Ekstrak kulit buah pepaya	0	0	2,50	3,00	3,50
2	Ekstrak kulit buah rambutan	0	0	2,00	2,00	2,00
3	Gliserin	0	10	0	0	0
4	Isopropil miristat	8,00	8,00	8,00	8,00	8,00
5	Steareth-2	1,51	1,51	1,51	1,51	1,51
6	Stereth-21	3,49	3,49	3,49	3,49	3,49
7	Setil alcohol	5,00	5,00	5,00	5,00	5,00
8	Metil paraben	0,1	0,1	0,1	0,1	0,1
9	Propil paraben	0,1	0,1	0,1	0,1	0,1
10	*Aquaset* ad	100	100	100	100	100

3. RESULTS AND DISCUSSION

The results of testing the effectiveness of the moisturizer on a combination cream of papaya peel extract and rambutan fruit peel were carried out on the day before (H0), the 14th day of use (H14) and the 28th day of use and the test results can be seen in table 2.**Table 2. Results of Testing the Effectiveness of Moisturizing Skin**

No	Formula	Averange of Moisturazing Skin (%)				
		H0	H14	∆ H14-H0	H28	∆ H28-H0
1	Blanko	50,57±5,538	47,90±4,934	-2,67	51,51±6,150	0,94

2	1	46,98±4,634	51,33±5,868	4,35	53,61±4,888	6,63
3	2	49,38±2,987	52,79±2,552	3,41	54,11±2,869	4,73
4	3	46,00±3,596	50,43±5,124	4.43	55,68±4,032	9,68
5	4	46,99±3,908	53,21±4,888	6,22	58,95±3,792	11,96

Note: H0 : The day before using the cream

H14: Day 14 of using the cream

H30: Day 28 of using the creamThe skin moisture test showed that the increase in skin moisture value occurred in all formulas, where the highest percentage value was seen in F4, namely the initial moisture value of 46.99±3.908 and after 29 days of use it became 58.95±3.792 there was an increase in skin moisture value of 11 .96 of the initial skin moisture value and the lowest value of moisture is seen in the blank (negative control), namely the initial moisture value is 50.57±5.538 and after 28 days of use it becomes 51.51±6.150, the value of the increase in skin moisture is 0.94 , while in F1 as a positive control, the value of skin moisture before use was 46.98 ± 4.634 and after 28 days of use it became 53.61 ± 4.888 there was an increase in skin moisture value of 6.63.

These results indicate that the value of the increase in skin moisture in F3 and F4 exceeds the skin moisturizing effect of F1, thus the higher the papaya peel extract and rambutan peel extract have good skin moisturizing power. Statistical testing with paired T test between the control group was negative, positive and the formula containing the extract, where sig = 0.001 with comparison = 0.05 means that there is a significant difference in the average percentage of skin moisture. In the statistical test annova sig = 0.002 with comparison = 0.05, it means that there is a significant difference in the average percentage of humidity effect from day to day. With statistical analysis it can be concluded that F2, F3 and F4 have effectiveness as moisturizers for the skin, when viewed from the results of the Blank test, positive control and test cream, where the results of using the subject provide changes in moisture after 28 days of use.

The results of the observation of chemical stability of the combination of papaya peel extract and rambutan peel extract. Cream stability testing was carried out for 3 months and measurements were carried out every month to observe the homogeneity and pH of the resulting cream. The test results can be seen in tables 3 and 4.

Table 3. Observation Results of Cream Homogeneity Stability Test

No	Moon	^{0}C	Homogenity				
			Blank	F1	F2	F3	F4
1	0	25	Homogen	Homogen	Homogen	Homogen	Homogen
		40	Homogen	Homogen	Homogen	Homogen	Homogen
2	1	25	Homogen	Homogen	Homogen	Homogen	Homogen
		40	Homogen	Homogen	Homogen	Homogen	Homogen
3	2	25	Homogen	Homogen	Homogen	Homogen	Homogen
		40	Homogen	Homogen	Homogen	Homogen	Homogen
4	3	25	Homogen	Homogen	Homogen	Homogen	Homogen
		40	Homogen	Homogen	Homogen	Homogen	Homogen

Table 4. Results of pH measurements

No	Moon	^{0}C	pH				
			Blank	F1	F2	F3	F4
1	0	25	5,11±0,206	5,07±0,440	5,06±0,227	5,04±0,201	5,02±0,218

		40	5,11±0,206	5,07±0,440	5,06±0,227	5,04±0,201	5,02±0,218
2	1	25	5,07±0,440	5,06±0,227	5,04±0,201	5,02±0,218	5,01±0,211
		40	5,07±0,440	5,06±0,227	5,04±0,201	5,02±0,218	5,01±0,211
3	2	25	5,11±0,206	5,07±0,440	5,06±0,227	5,04±0,201	5,02±0,218
		40	5,11±0,206	5,07±0,440	5,06±0,227	5,04±0,201	5,02±0,218
4	3	25	5,06±0,227	5,04±0,201	5,02±0,218	5,01±0,211	5,00±0,198
		40	5,06±0,227	5,04±0,201	5,02±0,218	5,01±0,211	5,00±0,198

Organoleptic examination and cream homogeneity test results of cream preparations (blank, F1, F2, F3 and F4) did not show any change in shape, color, odor and homogeneity of the cream for 3 months, thus the cream preparation made was stable for 3 months. Measurement of the pH of cream preparations from papaya peel extract and rambutan peel did not show a change in pH. The pH was still in the range of 4.5-6.5, thus the cream preparation made remained stable at 3 months of storage.

Testing the type of preparation based on the color dispersion and dilution method of cream of papaya peel extract and rambutan peel by adding water to the blanks, F1, F2, F3 and F4, the water in the cream can be mixed, and the painting is mixed with methylene blue into the blanks, F1, F2, F3 and F4, the color is evenly distributed on the cream, thus the cream preparation can be concluded to have an oil-in-water (m/a) type of preparation. The measurement results did not change the type of preparation, thus the cream preparations made remained stable at 3 months of storage.

Measurement of the flow properties of the cream preparations of papaya peel extract and rambutan peel extract can be seen in Figure 1-10. The results of the viscosity test and the flow properties of the preparations showed a viscosity of 22,000-90,000 cPs and pseudoplastic thixotropic flow properties. In storage for 3 months both at temperatures of 250^0C and 40^0C there was a change in viscosity due to water loss in the preparation.

4. CONCLUSION

The resulting cream was evaluated for stability and effectiveness in humans. The skin moisture test showed that the increase in skin moisture value occurred in all formulas, where the highest percentage value was seen in F4, namely the initial moisture value of 46.99±3.908 and after 29 days of use it became 58.95±3.792 there was an increase in skin moisture value of 11 ,96, while in F1 as a positive control, the value of skin moisture before use was 46.98 ± 4.634 and after 29 days of use it became 53.61 ± 4,888 there was an increase in skin moisture value of 6.63. The resulting cream was stable on storage for 3 months at temperatures of 250 and 400.

REFERENCES

1. Anonim, 2015. Statistik Tanaman Buah-Buahan dan Sayuran Tahunan Indonesia. Badan Pusat Statistik Indonesia. Jakarta.
2. Anonim, 2000. Departemen Kesehatan Republik Indonesia & Direktorat Jenderal Pengawasan Obat dan Makanan. Parameter Standar Umum Ekstrak Tumbuhan Obat. Jakarta: Bhakti Husada.
3. Anonim. Badan Pengawas Obat dan Makanan. Farmakope Herbal Indonesia. Jakarta.
4. Anonim. 2000. Departemen Kesehatan RI. Parameter Standar Umum Ekstrak Tumbuhan Obat. Jakarta. 2000.
5. Anonim. 1995. Farmakope Indonesia. Edisi IV. Jakarta: Departemen Kesehatan Direktorat Jenderal Pengawasan Obat dan Makanan; Hal. 7-9, 18, 48, 57, 112, 157, 186, 329, 529, 551, 652, 712-713.
6. Anonim. 2000. Departemen Kesehatan RI, Parameter Standar Umum Ekstrak Tumbuhan Obat, Jakarta. Halliwell, B. 2012. *Free Radicals and Antioxidant;* Updating a Personal View, Nutrition Review: Hal. 70, 257-265

7. Hasan H, dkk. 2018. Pemanfaatan Ekstrak Etanol Kulit Buah Rambutan (*Nephelium lappaceum* L.*)* Sebagai Krim Antioksidan, JF FIK UINAM, Vol. 6 No. 1.
8. Lachman L, Lieberman, HA. 1994. Teori dan Praktek Farmasi Industri. Edisi II. Jakarta: Universitas Indonesia Press: Hal. 3-1091.
9. Marliani L, Velayanti R, Roni A. 2015. Aktivitas Antioksidan dan Tabir Surya Pada Ekstrak Kulit Buah Pepaya (*Carica papaya* L.). Prosiding SNaPP Kesehatan.
10. Melliawati R, 2015. Pengelolahan Limbah Kulit Buah- Buahan Menjadi Selulosa oleh Bakteri *Acetobacter* sp. RMG-2. Pro Sem Nas Masy Diodiv Indon. Volume 1 (2), April.
11. Prashant Tiwari, Bimlesh Kumar, Mandeep Kaur, Gurpreet Kaur, Harleen Kaur. Phytochemical screening and extraction: A Review. Int.Pharm. Sciencia. 2011. 1(1). http://www.ipharmsciencia.com
12. Sari. K, Indrawati. T, Taurhesia. S. 2019. Pengembangan Krim Antioksidan Pelembab Ekstrak Kulit Buah Pepaya (*Carica papaya* L.) dan Kulit Buah Rambutan (*Nephelium lappaceum* L). Vol. 16 No. 1: 27-44Syamsidi A. 2014.
13. Pengaruh Variasi Ekstrak Kulit Buah Rambutan (*Nephelium lappaceum* L.*)* Terhadap Kestabilan Fisik Krim Antioksidan. Online Jurnal of Natura Science, Vol 3(2). Agustus: Hal 1-9.
14. Thitelerdecha, N., Teerawutgulrag, A., and Rakariyatham, N. 2008. *Antioxidant and Antibacterial Activities of Nephelium lappaceum L. Extracts, Food Science and Technology*. Thailand. 41: Hal. 2029-2035.
15. Voigth R. 1994. Buku Pelajaran Teknologi Farmasi, Edisi Kelima, Diterjemahkan oleh Drs. Soendani Noerono. Yogyakarta: Gadjah Mada University Perss.
16. Wulandari, N dan Lestari, S.R. 2012. *The Potency of Rambutan (Nephelium lappaceum L.) Fruit Peel Ethanolic Extract as an Antioxidant Natural Source Based on Viability Endotel Ce*l. Makalah disajikan dalam Seminar Internasional Lifes Science. Laboratorium Sentral Ilmu Hayati.