Face Mist Formulation 96% Ethanol Fruit Peel Extract Red Dragon (*Hylocereus polyrhizus*) As An Antioxidant Using the DPPH Method

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Abstract. High levels of air pollution can harm skin health. The skin is a layer of tissue that covers the entire body and protects it from external dangers. Red dragon fruit peel (Hylocereus polyrhizus) is a plant that contains flavonoids, alkaloids, betasinin, and functions as an antioxidant. Face mist is a type of cosmetic that serves as a skin freshener. This study aims to formulate a face mist using red dragon fruit peel (Hylocereus polyrhizus), which has a function to prevent skin damage due to free radicals and prevent premature aging. Face mist preparations are formulated into 4 formulations, namely with concentrations of 1%, 3%, and 5%. The characteristics of the physical properties of the face mist include organoleptic tests, homogeneity tests, pH tests, humidity tests, irritation tests, dry time tests, and antioxidant testing using the DPPH method. The results showed that 96% ethanol extract of red dragon fruit peel has antioxidant activity, namely in formulation 1, amounting to 440.880 µg/ml, in formulation 2, amounting to 430.606 µg/ml and in formulation 3, amounting to 421.797 µg/ml and in the comparison quercetin has antioxidant activity amounting to 38.059µg/ml. The face mist preparation formulation has a pH value of 5.0-5.8, in the humidity test, it has a value of 40%-60%, in the dry time test, it has a value of <5 minutes, and has a very weak antioxidant value in the face mist preparation.

Key words: [Ethanol extract 96%, red dragon fruit peel, Hylocereus polyrhizus, DPPH]

INTRODUCTION

High levels of air pollution negatively impact skin health, as skin plays a crucial role in the body's defense system. Damage to the skin can impact both health and appearance. Skin needs to be cared for and protected from external influences, especially pollution. High levels of pollution can cause skin health problems (Nusaibah *et al*., 2022). Skin is a layer of tissue that covers the entire body and protects it from external hazards. It contains pigmented mesodermal cells, or melanin, produced by melanocytes, which absorb some of the potentially harmful ultraviolet (UV) radiation from sunlight (Yanty & Siska, 2018).

An antioxidant is any substance in low concentration compared to the oxidized substrate that significantly facilitates or inhibits the oxidation of the substrate (Andriani & Murtisiwi, 2020). Antioxidants have a very important role in human health because they function as a soaker or trap that can react with free radicals. Antioxidants can also be obtained naturally and synthetically. Natural antioxidants are antioxidants found in the human body that are natural as the body's defense system. Natural antioxidants produced by the body are not enough to fight free radicals in excess in the body, so it requires antioxidant input from outside the body. Synthetic antioxidants are compounds that will be chemically synthesized (Widyantari & Sari, 2022).

Cosmetics come from the Greek word kosmetikos which means skill in decorating (Rachmawati et al., 2021) while according to the regulation of the Minister of Health of the Republic of Indonesia No. 220 / MenKes / Per / X / 1976 Cosmetics are materials or mixtures of materials that are used by rubbing, placing, pouring, sprinkling, or spraying on the body, splashing, spraying, used on the body or parts of the body, cosmetics are used on parts of the human body to clean, maintain, increase attractiveness or change appearance, and are not included in the classification of drugs to cure or treat a disease (Putri, 2019).

The red dragon fruit peel, originally known as an ornamental plant, has high economic value (Sari, 2017). Red dragon fruit peel has very high antioxidants compared to the fruit (Sawiji & La, 2021). Red dragon fruit peel has many benefits for treating various types of diseases, namely lowering blood sugar levels, lowering cholesterol, preventing colon cancer, strengthening kidney and bone function, protecting oral health (canker sores), preventing bleeding and vaginal discharge symptoms, strengthening brain function and improving visual acuity, cosmetic ingredients, and medication for vaginal discharge complaints (Syarifuddin *et al*., 2019). Red dragon fruit peel also contains anthocyanins that are water-soluble and can produce colors ranging from red to blue. In addition, the skin of red

dragon fruit also contains vitamin C, vitamin E, vitamin A, and several secondary metabolic compounds such as alkaloids, terpenoids, flavonoids, thiamine, niacin, cobalamin, phenolics, carotenes, and phytoalbumins, which also have antioxidant and antibacterial benefits (Kristanto, 2008).

Face mist is one of the cosmetic products that is water-based and contains natural ingredients that are beneficial for facial skin, which is used as a skin freshener on the face and can be used as a moisturizer to prevent facial skin from being exposed to free radicals (Muro'ah *et al*., 2024). Face mist has various forms, for example, face mist in the form of gel, liquid, oil, mousse, in choosing a face mist primer we must pay attention to the basic ingredients, because there are face mist primers that are used for oily facial skin and there are also those used for dry facial skin (Andriana & Puspitorini, 2018).

METHODS

Types of research

In this study, quantitative research was conducted experimentally by making a face mist preparation from 96% ethanol extract of red dragon fruit (Hylocereus polyrhizus) skin.

Research Design

This research was conducted by making a face mist preparation using 96% ethanol extract of red dragon fruit peel as an antioxidant, then conducting physical properties and antioxidant tests on the preparation.

Time and Place of Research

This research was conducted in April – June 2024, at the Pharmaceutical Technology Laboratory of the Kudus Cendekia Utama Health Technology Institute.

Population and Sample

96% ethanol extract of red dragon fruit peel (Hylocereus polyrhizus) obtained from PT. Lansida Herbal Technology.

Tools and Materials

The tools used in this study were stirring rods, porcelain cups, Erlenmeyer flasks (Pyrex), measuring cups (Pyrex), beakers (Pyrex), UV-Vis spectrophotometers, pH meters, viscometers, micropipettes, measuring flasks, mortars and mortars, beakers, dropper pipes, and analytical scales.

Material

The materials used in this study were Aquades, glycerin, 96% ethanol extract of red dragon fruit peel (Hylocereus polyrhizus) from PT Lansida Herbal Technology, 96% ethanol, quarsetin, filter paper, parchment paper, DPPH, propylene glycol, and sodium benzoate.

Face Mist Preparation Formulation

The formulation of the face mist preparation is based on the formula from Asur (2023) with the addition of 96% ethanol extract of red dragon fruit peel, which can be seen in the table below.

Table 1. The formulation of the face mist

Material	Function	Concentration (%)	Formulation			
			F0	F1	F2	F3
Fruit peel extract red dragon (*Hylocereus polyrhizus)*	Active ingredient	-	-	1	3	5
Glycerin	Moisturizer	≤30	10	10	10	10
Propylene glycol	Moisturizer	≈15	4	4	4	4
Sodium benzoate	Preservative	0,1-0,5	0,2	0,2	0,2	0,2
Aquades	Solvent	-	ad100	ad100	ad100	ad100

Information:

F0: Base (without red dragon fruit peel concentration)

F1: Face mist formulation containing 1% red dragon fruit peel extract

F2: Face mist formulation containing 3% red dragon fruit peel extract

F3: Face mist formulation containing 5% red dragon fruit peel extract

Dragon fruit skin extract is taken then mixed with an oil phase such as glycerin, put it in a mortar then stir until homogeneous, add the water phase such as propylene glycol and sodium benzoate dissolved using distilled water, add little by little then stir until homogeneous until it forms a face mist preparation then add the water phase, namely distilled water until the limit mark.

Physical Properties Test of Preparations

1) Organoleptic Test

   Organoleptic test: the formulation of the face mist preparation is tested by visual observation or the five senses of the shape, color, and smell of the preparation.

2) Homogeneity test

   The homogeneity test was carried out by taking 5 mL of face mist preparation for each formulation, then putting it into a beaker glass and then observing it visually to see whether or not there were coarse grains in the preparation.

3) pH test

   The pH test is carried out using a pH meter; the method is for each 5 mL of each preparation formulation, and then the pH meter is inserted into the preparation formulation.

4) Humidity test

   The moisture test was conducted to determine the moisture of human skin, the method was by using 12 volunteers then each volunteer was tested with a face mist preparation formulation before being sprayed the preparation was tested for its moisture then the preparation was sprayed and waited for a predetermined time, namely 1 minute, 30 minutes and 1 hour after that the moisture was measured using a skin analyzer.

5) Irritation test

   The irritation test was carried out to determine whether there was irritation after being sprayed with the face mist preparation, the method was carried out on 12 volunteers, then the face mist preparation was sprayed on each volunteer, then they waited for the specified time, namely 1 minute, 30 minutes and 1 hour, then the results were seen whether there was irritation such as redness, itching and heat on the skin that had been sprayed with the face mist.

6) Dry time test

   The dry time test was carried out to determine how long the drying time was after spraying the face mist preparation. The method was carried out on 12 volunteers, then the face mist formulation was sprayed on each volunteer, and then the drying time was calculated with a stopwatch.

Antioxidant activity test using the DPPH method

1) Preparation of DPPH solution

   The preparation of 0.4 mM DPPH solution was carried out by weighing 7.8864 mg of DPPH, then dissolving it in 50 mL of ethanol, so that the concentration of 0.4 mM DPPH solution was calculated against the DPPH BM of 394.32 g/mol. Then the solution was placed in a dark bottle and shaken until homogeneous.

2) Determination of the maximum wavelength of DPPH

   The maximum wavelength was determined by making a 0.4 mM DPPH reagent solution by inserting 1.0 mL of 0.4 mM DPPH solution into a dark vial, then adding 4 mL of ethanol then wrapping it with aluminum foil, then homogenizing it. Then it was inserted into a cuvette and the absorbance was measured using a UV-Vis spectrophotometer at a wavelength of 500-600 nm.

3) Determining Operating Time

   1 mL of 0.4 mM DPPH solution was added to 4 mL of 30 ppm quercetin standard solution. Then, the absorbance of the solution was measured using a UV-Vis spectrophotometer at the maximum wavelength that had been determined until it reached a stable absorbance.

4) Preparation of DPPH balance solution

   Take the 0.05 mM DPPH solution that has been made, and take 1.5 mL. Then add ethanol PA to the mark of the 5 mL measuring flask. Wrapped in aluminum foil and then homogenized. The incubation process is carried out in a dark room and protected from light for the predetermined operating time, then the blank DPPH solution is inserted into the cuvette, and its

absorbance is measured using a UV-Vis spectrophotometer at the maximum wavelength that has been determined.

5) Preparation of quercetin comparison solution

The preparation of quercetin was carried out by weighing 25 mL of quercetin, then adding ethanol to the limit mark, and then shaking until homogeneous. The concentration of the 1000 ppm quercetin solution was reduced to 100 ppm. The concentration series was made by taking 1 mL, 2 mL, 3 mL, 4 mL, and 5 mL, dissolving them in 10 mL of ethanol, then obtaining concentrations of 10 ppm, 20 ppm, 30 ppm, 40 ppm, and 50 ppm.

6) Antioxidant activity testing of quercetin comparison solution

Testing the positive control solution of quercetin on each quercetin, pipetted as much as 2 ml, then added 1.5 mL DPPH solution and 1.5 mL ethanol. Then incubated in a dark room and at room temperature for 38 minutes. Next, test the quercetin control solution using a UV-Vis spectrophotometer with the maximum wavelength that has been obtained previously.

7) Preparation of test solution concentration for face mist preparation with 96% ethanol extract of red dragon fruit peel.

Weighing the preparation of face mist, 96% ethanol extract of red dragon fruit peel as much as 25 mg, then put it into a 25 ml measuring flask, then added ethanol to the limit mark, then shaken until homogeneous, so that the concentration of the mother liquor is 1000 ppm. Then the mother liquor is made with 5 series of concentrations, namely by taking 0.5 mL, 1 mL, 1.5 mL, 2 mL, 2.5 mL, then dissolved in 5 mL of ethanol as a solvent, and the concentrations obtained were 100 ppm, 200 ppm, 300 ppm, 400 ppm, and 500 ppm.

8) Antioxidant activity testing of a face mist preparation made from 96% ethanol extract of red dragon fruit peel

Preparing the solution that has been made, each concentration of the test solution in a 2 mL pipette is put into a 5 mL measuring flask, then added with 1.5 mL of 0.5 mM DPPH solution and 1.5 mL of ethanol then homogenized, the test solution is incubated in a dark room and protected from light for the specified operating time. Next, the absorbance is measured using a UV-Vis spectrophotometer at the specified maximum wavelength.

9) Determination of IC50 value and creation of calibration standard curve

The determination of antioxidant activity using the DPPH method is expressed as an IC50 value. The lower the IC50 value, the greater the antioxidant activity. The percentage of DPPH inhibitory activity in face mist and quercetin is expressed by the formula below:

$$\% \text{ Inhibition: } \frac{Abs\ Kontrol - Abs\ Sampel}{Abs\ Kontrol} \times 100\%$$

The inhibition percentage data is then graphed between concentration (x) and % inhibition (y) so that the linear regression equation y = ax + b can be obtained. By entering the value y = 50, the IC50 value will be obtained.

RESULTS AND DISCUSSION

Phytochemical screening of 96% ethanol extract of red dragon fruit peel

Table 2. Phytochemical screening data of samples

No	Secondary metabolites	Color description results	Red Dragon Fruit Peel Extract
1	Flavonoid	Yellow/orange in color	+
2	Alkaloid		
	a) Mayer test	a) formation of white or yellow sediment	-
	b) Wagner test	b) formation of brown sediment	-
	c) Dragendorff test	c) formation of orange precipitate	-
3	Tannin test	Blue or greenish black discoloration	-
4	Saponin test	Formation of foam	+

Information:

+ : Positive or contains the tested compound

- : Negative or does not contain the tested compound

Based on the results of the phytochemical screening above, the 96% ethanol extract of red dragon fruit peel contains secondary metabolic compounds, namely flavonoids, because it produces a yellow or orange complex compound due to the complex compound of magnesium ions with phenoxine ions in flavonoid compounds. The compounds contained in the extract that are suspected to be flavonoids will undergo a reduction process with concentrated Mg and HCl and will form a complex compound, namely [Mg (OAr)6] 4- (Oktavia & Sutoyo, 2021). and saponins show positive results because the addition of 2N HCl can produce more and stable foam, and the foam lasts for 10 minutes with the formation of foam (Sulistyarini et al., 2019).

Physical Properties Parameter Test of Face Mist Preparations

1) Organoleptic Test

The organoleptic test aims to see the physical appearance of the face mist preparation of 96% ethanol extract of red dragon fruit skin by observing the color, smell, and shape of the preparation. This test is carried out using the five human senses. The results of the organoleptic test of the face mist preparation can be seen in Table 3.

Table 3. Organoleptic Test Results

Formulation	Color	Smell	Form
F0	Clear white	Special extract	Liquid
F1	Light brown	Special extract	Liquid
F2	Chocolate	Special extract	Liquid
F3	Dark chocolate	Special extract	Liquid

The research results obtained from the face mist preparations that have been made have almost the same characteristics, namely, having the same shape and smell. The difference in each formulation is in the color. Formulation 0 has a clear white color, formulation 1 has a light brown color, formulation 2 has a brown color and formulation 3 has a dark brown color, this shows that the increasing concentration of 96% ethanol extract of red dragon fruit peel added to each formulation will affect the resulting color, making it increasingly concentrated (Amelia Tricamila 2024).

2) Homogeneity test

The homogeneity test aims to determine the homogeneity of the face mist preparation and to identify possible changes in the preparation. The results of the homogeneity test can be seen in Table 4.

Table 4. Data from the results of the homogeneity test

Formula	Homogeneity test	Meets/ Not Meets
F0	Homogeneous	Fulfil
F1	Homogeneous	Fulfil
F2	Homogeneous	Fulfil
F3	Homogeneous	Fulfil

Based on the results of observations of the homogeneity test of the face mist preparation, it can be seen in table 4.3 where the formulas F0 (base), F1 (1%), F2 (3%), F3 (5%) show that the mist phase has good homogeneity because in all formulations in the preparation there are no coarse particles, and the ingredients contained in the face mist preparation formulation have been mixed evenly, so it can be stated that the face mist preparation formula can be said to be stable.

3) pH test

A pH test is performed to determine the pH value of the face mist preparation and to determine whether it matches the skin's pH, ensuring safety and preventing skin irritation. This can be seen in Table 5.

Table 5. Data on pH test results of the preparation

Formulation	Average ±SD	Standard	Meets/Not Meets
F0	5.8 ±0.100	4.5-6.5	Fulfil
F1	5.5 ±0.400	4.5-6.5	Fulfil
F2	4.7 ±0.208	4.5-6.5	Fulfil
F3	5.0 ±0.115	4.5 -6.5	Fulfil

Based on the results of the pH test observation data, the results showed that the pH of F0 to F4 decreased, so that it became acidic after being added with 96% ethanol extract of red dragon fruit skin as much as 1%, 3%, and 5%. The pH results in F0, which is a formulation without 96% ethanol extract of red dragon fruit skin, has a pH value of 5.8 while in F1-F3, after being added with 96% ethanol extract of red dragon fruit skin decreased, namely becoming more acidic, where the results in F1 were 5.5, F2 4.7 and F3 5.0. If a pH has a value outside the skin pH value interval, it will cause scaly skin, or irritation, and if the pH has a value above the skin pH can cause the skin to feel slippery, dry quickly, and can also affect skin elasticity (Asjur et al., 2023).

Based on the results of statistical analysis data shows that the pH test in the normality and homogeneity test shows normally distributed results because (p value> 0.05) in homogeneous data with a significant value of 0.291 (p value> 0.05). Then continue with the one way anova test to find out whether there is a difference or not, the results of this test show that the data has a significant difference of 0.002 (p value <0.05) then continued with the post hoc tukay test to find out the differences in each group, the results show that in F0: F1, F1: F3, F2: F3 shows significant data or there is no difference because (p value> 0.05) and in F0: F2, F0: F3, F1: F2 shows that the data is not significant or there is a difference because (p value <0.05). This shows that the increasing variety of extracts added will affect the pH value in the preparation.

4) Humidity test

This test was conducted to determine whether the F0, FI, FII, and FIII concentrations maintained good skin moisture after using the face mist. The test was performed on the backs of volunteers' hands. The moisture test results are shown in Table 6.

Table 6. Humidity test results data

Formulation	Time	Mean ±SD
F0 (0%)	1 minute	60 ± 0.00
	30 minutes	41 ± 0.577
	1 hour	42 ± 5, 507
F1 (1%)	1 minute	59 ± 0.577
	30 minutes	40 ± 1,527
	1 hour	44 ± 4,582
F2 (3%)	1 minute	59 ±0.577
	30 minutes	43 ±4,358
	1 hour	36 ±5,033
F3 (5%)	1 minute	60 ±0.00
	30 minutes	39 ±2,886
	1 hour	41 ±6,244

The results of the data on the humidity test show that each formulation was tested with a predetermined time of 1 minute, 30 minutes, and 1 hour, where at F (0) the humidity value is 60%, 41% and 42% which is said to be moist skin because <60%. At F1, the results are 60%, 41%, and 48% which is said to be moist skin because <60%. At F2 at 1 minute and 30 minutes, the humidity value is 59%, 43%, which shows moist skin, and at 1 hour, the humidity

value is 36%%, which can be said to be dry skin because <40%. At F3 at 1 minute and 1 hour, the humidity value is 60% and 41% which can be said to be moist skin, and at 30 minutes, the humidity value is 39% which can be said to be dry skin because <40%. Based on the analysis resultsstatistics show that the normality and homogeneity tests show that the data is not normally distributed because (p value> 0.05) and the homogeneity test has a significant value of 0.000 (p value <0.05). Then the Kruskal-Wallis test continues, which shows significant data or there is a difference in the results of 0.000 (p value 0.05). Then the Mann-Whitney test is continued to determine the differences in each group, showing the results at 1 minute, with 1 hour showing significant data or there is a difference because (p value <0.05), at 1 minute and 30 minutes showing significant data or there is a difference because (p value <0.05). At 30 minutes with 1 hour showing insignificant data, or there is no difference because (p value> 0.05). The humidity of the face mist preparation shows a significant difference because the longer the time needed, the will cause the skin to become more moist.

5) Irritation test

Irritation testing was performed to determine whether skin irritation occurred after application of the product. Skin irritation testing was performed on the back of a volunteer's hand. The results of the irritation testing are shown in Table 7.

Table 7. Data from the results of the irritation test

Formulation	Time	Replication		
		I	II	III
F0	1 minute	-	-	-
	30 minutes	-	-	-
	1 hour	-	-	-
F1	1 minute	-	-	-
	30 minutes	-	-	-
	1 hour	-	-	-
F2	1 minute	-	-	-
	30 minutes	-	-	-
	1 hour	-	-	-
F3	1 minute	-	-	-
	30 minutes	-	-	-
	1 hour	-	-	-

This test was conducted with 12 volunteers who had normal skin. This test was carried out by spraying a face mist preparation of 96% ethanol extract of red dragon fruit peel on the back of the volunteer's hand, then waiting for a predetermined time of 1 minute, 30 minutes, and 1 hour. In the results of the irritation test, F0 to F3, no irritation occurred, such as redness, itching, and heat swelling, because the face mist had met the skin pH range (Lestari et al., 2020). Showing that the addition of a concentration of 96% ethanol extract of red dragon fruit peel, namely 1%, 3%, and 5%, did not affect the appearance of irritation on the skin (Asjur, 2023).

6) Dry time test

The drying time test aims to determine the drying time required after spraying the face mist. This test was conducted on 12 volunteers. The results of the drying time observation test can be seen in Table 8.

Table 8. Drying Time Test Results Data

Formulas i	Average ±SD	Standard	Meets/Not meets
F0 F1 F2	3.530±0.056	<5 minutes	Fulfill Fulfill Fulfill
F3	2.205±0.1202	<5 minutes	Fulfil
	2,380±0,1946	<5 minutes	
	1,900±0,3066	<5 minutes	

The results of the dry time test for the face mist preparation showed that F0 had an average of 3 minutes 19 seconds, F1 had an average of 3 minutes 33 seconds, F2 had an

average of 2 minutes 38 seconds, and F3 had an average of 1 minute 90 seconds. This shows that the higher the concentration of extract contained in the 96% ethanol extract face mist preparation, the faster the resulting dry time will be. Formulation 3 showed a faster dry time compared to other formulations, but the resulting dry time was slightly sticky and damp on the skin because it was influenced by the higher extract (Wahyuningsih et al., 2023).

Based on the data, the statistical test results on the drying time test of the preparation showed that the results of the normality and homogeneity tests showed that all formulations obtained normally distributed data because (p value> 0.05) and homogeneous data with a significant value of 0.096 (p value . 0.05). Followed by a one-way ANOVA test to determine whether there is a difference or not. The results of this test indicate that the data has a significant difference with a value of 0.004 (p value <0.05). Then continued with the Tukay post hoc test to determine the differences of each group in F0: F1, F0: F2, F2: F3 showed that the data was not significant or there was no difference because (p value> 0.05) in F0: F3, F1: F2, F1: F3 showed that the data had a significant difference because (p value <0.05). This shows that the more the concentration of 96% ethanol extract of red dragon fruit peel is added to the preparation, the higher the concentration of extract contained in the 96% ethanol extract face mist preparation, and the faster the drying time produced.

Antioxidant activity test using the DPPH method

In the antioxidant activity test using the DPPH method, absorbance was measured using a UV-Vis spectrophotometer. The purpose of antioxidant activity is to determine a compound's ability as an antioxidant. This study used the DPPH method. This method was chosen because of its advantages: it is simple, easy, fast, and requires a small sample (Asriani Suhaenah, 2023).

The initial stage carried out in the antioxidant activity test was to determine the maximum wavelength of the DPPH solution, which resulted in 518 nm and an absorbance of 0.593. This corresponds to the maximum wavelength range of DPPH, which is 500-600 nm. Next, determine the operating time. The operating time obtained is 38 to 40 minutes.

This study used a positive control for quercetin because quercetin is a flavonoid often found in various plants and is known for its biological antioxidant activity, particularly in antioxidants (Husniati et al., 2021). The results of standard quercetin absorbance measurements were carried out using UV-Vis spectrophotometry with a maximum wavelength of 518 nm and incubated for 38 minutes. The parameter used in this study was the IC50, which is the concentration of the test compound to absorbs DPPH radicals by 50%. The lower the IC50 value, the greater the antioxidant value.

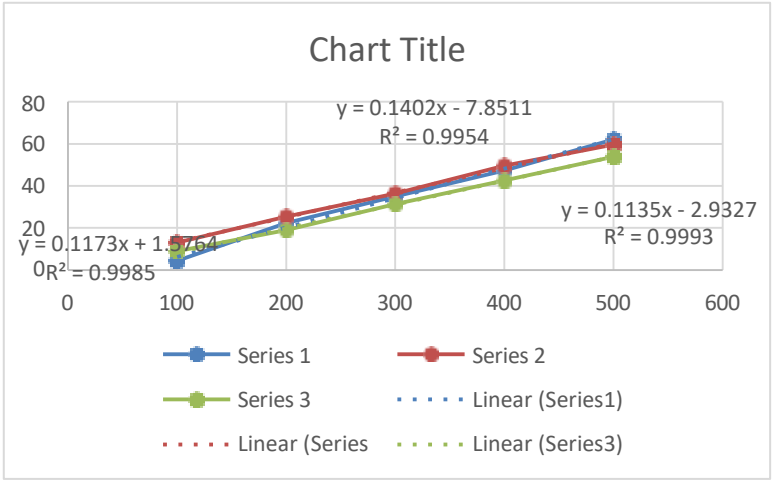

Figure 1. Standard curve of quercetin comparison

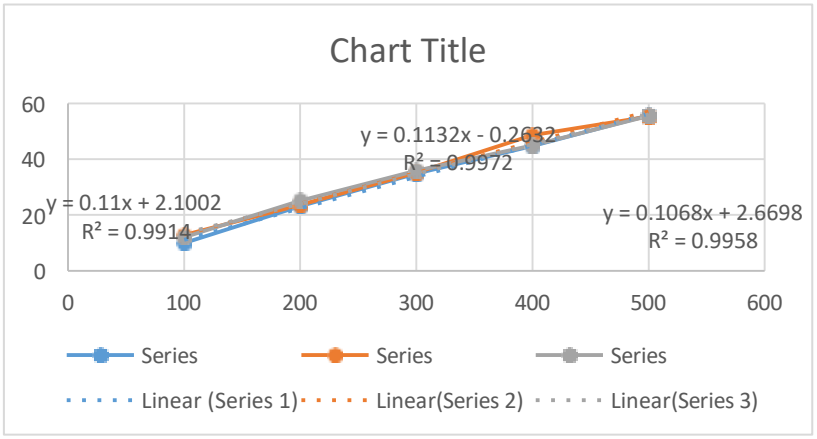

Figure 2. Standard curve of face mist preparation (F1)

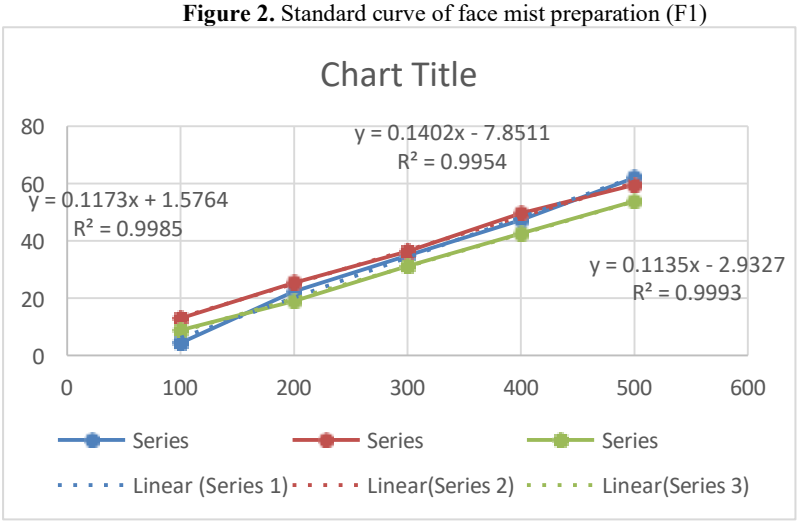

Figure 3. Standard curve of face mist preparation (F2)

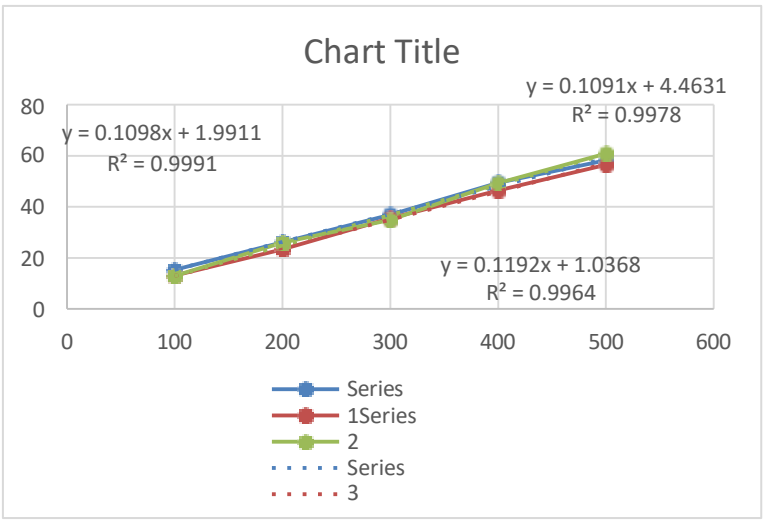

Figure 4. Standard curve of face mist preparation (F3)

Based on the antioxidant activity test, the positive control of quercetin has a very strong antioxidant activity category because it has an IC50 value of less than 50, namely a result of 38.0595 ppm, while in the antioxidant activity test on the face mist preparation, the IC50 value in formulation 1 has a value of 440.880, in formulation 2 has a value of 430.606, in formulation 3 has a value of 421.797 with a very weak antioxidant category because the results of the IC50 have a result of more than 250 ppm.

CONCLUSION

Conclusion

1. 96% ethanol extract of red dragon fruit peel can be formulated into a face mist preparation.
2. The preparation of 96% ethanol extract face mist of red dragon fruit peel meets the physical characteristics requirements, namely organoleptic test, homogeneity test, pH test, humidity test, drying time test, and irritation test.
3. The 96% ethanol extract of red dragon fruit peel has very weak antioxidant activity using the DPPH method.

Suggestion

After seeing the results of the research on the formulation study and activity test of the face mist extract of 96% ethanol of red dragon fruit peel (Hylocereus polyrhizus) using the DPPH method, in conducting further research, the author suggests adding extracts to each formulation because the antioxidants in this study showed very weak results.

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