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Formulation And Effectiveness Testing of Moringa Leaf (Moringa Oleifera) Ethanol Extract Lotion as A Skin Moisturizer

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Abstract

As the body's outermost organ, the skin is directly exposed to a prooxidant environment and triggers the formation of free radicals which are also called reactive oxygen species. In Indonesia itself, there are many natural plants that can be used as traditional ingredients and are starting to be developed because the side effects are smaller compared to chemical substances. The results of the research showed that the three concentrations of Moringa oleifera leaf ethanol extract produced produced a distinctive aroma, had a soft texture, was easy to spread, formed a semi-solid or gel consistency, and did not feel sticky. The observation results showed that the three concentrations of cream formulation formulations were physically homogeneous, this shows that the ingredients used in making the cream were mixed perfectly. The 0.5% concentration has an average pH value of 6.32, the 2% concentration has a pH of 6.30, and the 5% concentration has a pH of 6.28. From these results it can be said that the pH value is still within the ideal pH range. The 5% concentration has the most dominant or greatest spreadability value compared to the 0.5% and 2% concentrations. The average adhesion value at a concentration of 0.5% is 42.05, at a concentration of 2% the average is 55.84 and at a concentration of 5% the average is 77.72%. From the results of the average value obtained from the three concentrations above, the three concentrations in this study fall into the adhesive strength range of 2.00 - 300.00 seconds, where this adhesive strength is a requirement for good cream adhesive strength. The ethanol extract lotion formulation of Moringa leaves (Moringa oleifera) in 0.5%, 2%, 5% preparations is effective in moisturizing the skin with a concentration of 5% being the most effective in moisturizing the skin. The lotion formulation of ethanol extract of Moringa leaves (Moringa oleifera) in preparations of 0.5%, 2%, 5% has effectiveness in smoothing the skin with a concentration of 5% being the most effective in smoothing the skin. The ethanol extract lotion formulation of Moringa oleifera leaves in 0.5%, 2%, 5% preparations is effective in shrinking pores, with a concentration of 5% being the most effective. The ethanol extract lotion formulation of Moringa leaves (Moringa oleifera) in 0.5%, 2%, 5% preparations is effective in reducing wrinkles, with a concentration of 5% being the most effective in reducing wrinkles. The ethanol extract lotion formulation of Moringa oleifera leaves in 0.5%, 2%, 5% preparations is effective in increasing the density of collagen fibers, with a concentration of 5% being the most effective in increasing the density of collagen fibers.

Keywords: ***Lotion Preparation, Moringa Leaves, Skin Moisturizer***

1. Introduction

Skin or also called integumentary tissue, which consists of epithelial, mesenchymal, glandular and neurovascular elements, is not only the covering of the body. The skin plays an important role in maintaining homeostasis. Integumentary tissue has a membrane with the lowest water permeability, thereby preventing skin dehydration in dry weather conditions (Halim, 2017).

Human skin has a function as a barrier to protect the body from various external environmental influences, both physical, mechanical and chemical. Apart from that, it also serves as a body covering

that has aesthetic value. Skin is said to be healthy and normal if the outer layer of skin contains more than 10% water. This is caused by the regulation of fluid balance in the skin. If the fluid balance in the skin is disturbed, oil production in the skin is reduced and is influenced by an unfavorable environment, it can cause the skin to become dry (Isfardiyana, 2016).

As the body's outermost organ, the skin is directly exposed to a pro-oxidant environment and triggers the formation of free radicals which are also called reactive oxygen species (ROS). The mechanism of damage caused by free radicals is quite complex, through a chain reaction that causes oxidative stress which causes cell damage and skin disorders (Andarina and Djauhari, 2017).

Free radicals can damage the collagen and elastic structures that make up the skin so that the skin becomes less elastic and wrinkle lines appear, disrupt the distribution of melanin pigment and melanocytes so that pigmentation is uneven, and damage the macro molecules that form cells, namely proteins, carbohydrates, fats and DNA which are can cause skin cancer (Rodina et al., 2016). 50% of the formation of free radicals is caused by exposure to UV rays. People who are exposed to UV rays every day will experience premature aging because the collagen tissue and oil glands are no longer able to moisturize the skin and regenerate it. Free radicals due to ultraviolet exposure, apart from damaging DNA, can also suppress the body's immunity, and activate chemicals in the body that can cause cancer, cause skin damage, sunburn, erythema, cause brown spots, as well as thickening and drying of the skin. (Wadoe et al., 2019).

Dry skin or xerosis cutis is a skin condition that experiences a lack of water content in the stratum corneum to below 10%. Dry skin is a problem that is often encountered, but is often ignored. Dry skin that is not cared for properly can become a source of infection, disrupt sleep due to itching, and even depression. Dry skin will also look dull, feel rough, scaly, wrinkled, and less elastic than normal skin (Yulisa and Menaldi, 2023). This will reduce a person's self-confidence in their appearance. If it is severe, it can interfere with a person's work activities. For this reason, it is very important to keep your skin healthy. In dry skin, a natural protection factor is available, namely Natural Moisturizing Factor (NMF). However, in certain conditions natural skin protection factors are not sufficient so additional non-natural protection is needed, namely by providing moisturizer. Moisturizers, also known as emollients, are the addition of water to the skin and increase the water binding capacity of the stratum corneum. The stratum corneum layer is an interactive and dynamic structure, its function is to protect and maintain skin moisture. Moisturizers are generally used to reduce fine lines, soften and moisturize the skin. This may improve an individual's self-confidence, psychological satisfaction, and quality of life. Moisturizer works effectively to treat dry skin and maintain smooth skin. Moisturizer is one of the products that is in great demand, even now moisturizing products have been developed using natural ingredients, such as plants and vitamins (Butarbutar and Chairunisaa, 2021). In Indonesia itself, there are many natural plants that can be used as traditional ingredients. Recently, traditional ingredients have been widely used and are starting to be developed because the side effects caused by natural ingredients as ingredients for health and beauty are smaller compared to those from basic ingredients. chemicals. Apart from low side effects, using traditional ingredients can save costs because the price is more affordable. (Daud and Suyanti, 2017).

Like research conducted by Girsang E, et al (2019) on snake fruit (Salacca zalacca) as a natural ingredient that can inhibit skin aging, the research results explain that together the compounds found in snake fruit can inhibit proteins related to skin aging and have the potential to used as an anti-aging agent (Girsang, E et al, 2019). Apart from snake fruit, there are also other plants that have many benefits, such as Moringa leaves. One natural ingredient that can be used as an anti-oxidant is Moringa oleifera leaves. In previous research it was reported that Moringa leaves contain seven times more vitamin C than oranges, ten times more vitamin A than carrots, seventeen times more calcium than milk, nine times more protein than yoghurt, fifteen times more potassium than bananas and iron are twice as large as spinach. The content of ascorbic acid, ß-carotene, tocopherol acid, flavonoids, phenolics, carotenoids, hydroxynamite acid derivatives, and flavonoids means that Moringa leaves can be used as a source of natural antioxidants. This antioxidant activity causes Moringa leaves to be used as antiaging (Sugihartini and Nuryanti, 2017).

Research by Susanty et al (2019) on testing the antioxidant activity of Moringa oleifera leaf extract using the DPPH method stated that Moringa leaf extract has very strong antioxidant activity. The beta carotene content in Moringa leaf extract also has potential as an antioxidant because it protects lipid membranes from peroxidation and at the same time stops chain reactions from free radicals. The mechanism of beta carotene as an antioxidant occurs indirectly, namely preventing lipid peroxidation

in cell membranes by protecting cell membranes and maintaining cell membrane integrity with free radicals (Satriyani, 2021).

2. Methods

This type of research is experimental research using a pre-test and post-test control group design. Experimental research is a research activity to control and observe research (Sugiyono, 2017). Experiments were carried out to determine the formulation and effectiveness of Moringa oleifera leaf extract lotion in moisturizing, smoothing, shrinking pores and reducing skin wrinkles and to see the density of collagen fibers. The sample for this research was Moringa oleifera leaf extract lotion obtained from the online shop Shopee. Making an extract from 600 grams of Moringa leaves soaked in 96% ethanol. The test animals that will later be used are male Wistar rats obtained from the Laboratory of the Faculty of Pharmacy, University of North Sumatra, 25 rats weighing 150-250 g. Mice were kept in the Laboratory of the Faculty of Pharmacy, University of North Sumatra.

3. Results and Discussion

Test Results of Moringa Leaf Ethanol Extract Lotion Formulation (Moringa oleifera)

The following are the results of lotion formulation tests from ethanol extract of Moringa oleifera leaves which include organoleptic tests, homogeneity tests, pH tests, spreadability tests, and adhesiveness tests.

Organoleptic Test Results

The following are the results of organoleptic test observations on the Moringa leaf ethanol extract formulation in terms of color, aroma and shape.

Table 1. The result of organoleptic test observations on the preparatory formulation of kelor leaf ethanol extract (*Moringa oleifera)*

Testing	0,5%	2%	5%
Organoleptis -Color	Green	Green	Green
Organoleptis -Aroma	Characteristic smell	Characteristic smell	Characteristic smell
Organoleptis -Shape	Gel	Gel	Gel

Source: Primary Data 2023

Organoleptic examination did not show any color differences in the cream preparations with concentrations of 0.5%, 2% and 5%, all three of which had a green color due to Moringa leaf extract. The three concentrations of Moringa oleifera leaf ethanol extract produced produce a distinctive aroma. has a soft texture, spreads easily, forms a semi-solid or gel consistency, and does not feel sticky.

Homogeneity Test Results

The following are the results of observations for the homogeneity test on the ethanol extract formulation of Moringa leaves (Moringa Oleifera)

Table 2. Results of homogeneity test observations on Moringa leaf ethanol extract preparation formulations (*Moringa oleifera)*

Testing	Result		
	0,5%	2%	5%
Homogeneous	Homogeneous	Homogeneous	Homogeneous

Source: Primary Data 2023

The homogeneity examination at the three concentrations of Moringa leaf ethanol extract formulation aims to observe the presence of coarse particles on the slide. The observation results showed that the three concentrations of cream formulation formulations were physically homogeneous, this shows that the ingredients used in making the cream were mixed perfectly.

pH Test Results

Testing the pH of the preparation is carried out with the aim of determining the acidity level of the preparation. If the pH of the preparation is low or acidic it will cause irritation to the skin, if the pH of the preparation is high or alkaline it will cause dry skin when applied. The results of testing the pH of the Moringa leaf ethanol extract formulation can be seen in Table 4.3 below.

Table 3. pH Examination Results

Setup	pH Measurement Results			
	pH			Avarage ±STD
0,5%	6,32	6,32	6,31	6.32±0.06
2%	6,30	6,30	6,29	6.30±0.06
5%	6,28	6,28	6,28	6.28±0.00

Source: Primary Data 2023

Table 3 explains the results of the pH test on the Moringa leaf ethanol extract preparation formulation. From the table it can be seen that the 0.5% concentration has an average pH and STD value of 6.32 ± 0.06, a 2% concentration has an average pH value and The STD is 6.30 ± 0.06, and the 2% concentration has an average pH and STD value of 6.28 ± 0.00. From these results it can be said that the pH value is still within the ideal pH range. According to SNI 16-4399-1996 in (Astikah, 2019), the ideal pH of a cream formulation is in accordance with the pH of the skin, which is in the range of 4.5 - 8.0. If the pH of the cream does not match the pH of the skin, it will cause skin irritation.

Spreadability Test Results

The spreadability test is carried out to determine the base's ability to spread on the skin surface when applied. A good base spreading ability will make it easier when the cream preparation is applied to the skin. The spreadability test results can be seen in table 4 below.

Table 4. Spread Force Test Results On Kelor Leaf Ethanol Extract Preparation (*Moringa oleifera*)

Load mass	**Dispersion Force Diameter (cm)**		
	0,5%	**2%**	**5%**
0	4,2	4,4	4,8
100	4,7	5	5,2
125	5	5,3	5,5

Source: Primary Data 2023

Table 4 explains the results of the spreadability test on Moringa leaf ethanol extract preparations. From the results of observations it can be seen that the 5% concentration has the most dominant or greatest spreadability value compared to concentrations of 0.5% and 2%. From these results it can be concluded that the more The greater the concentration of Moringa leaf ethanol extract preparation, the greater the resulting distribution area due to an increase in viscosity. The wider the spreading area produced by a cream, the better the spreading ability of the cream will be when applied.

Adhesion Test Results

The adhesion test is intended to determine the ability of the Moringa leaf ethanol extract preparation to adhere to the applied area, namely the skin. The adhesive strength test results of the three concentrations can be seen in table 5 below.

Table 5. Adhesion Test Results

Concentration	**Adhesion (Seconds)**			**Average**
	1	**2**	**3**	
0,5%	42,57	41,31	42,29	42,05
2%	55,55	54,62	57,35	55,84
5%	77,68	79,91	75,58	77,72

Source: Primary Data 2023

Table 5 explains the results of the adhesion test on the ethanol extract of Moringa leaves. From the results of the observations it was found that the average value of adhesion at a concentration of 0.5%

was 42.05, at a concentration of 2% the average was 55.84 and at a concentration of 5% the average was the average is 77.72%. From the results of the average value obtained from the three concentrations above, the three concentrations in this study fall into the adhesive strength range of 2.00 – 300.00 seconds. The requirement for good cream adhesion is 2.00 – 300.00 seconds (Roosevelt et al., 2018). From these results, the three concentrations in this study meet the requirements to be a preparation for moisturizing the skin, the greater the concentration, the greater the adhesive power.

The Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing the Skin

Table 6. Results of Observation of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing the Skin

F	Volunteers	Week 0	Week 1	Week 2	Week 3	Week 4	Percent Humidity
	1	23	25	27	29	30	23,33
	2	25	26	28	30	31	19,35
	3	25	26	27	28	29	13,79
	4	24	25	27	28	29	17,24
F1	5	26	27	28	30	31	16,13
	War- war	**24,6**	**25,8**	**27,4**	**29**	**30**	**18,00**
	1	23	26	28	30	32	28,13
	2	24	25	28	31	33	27,27
	3	23	25	27	29	31	25,81
	4	22	24	26	28	30	26,67
F2	5	25	27	29	31	33	24,24
	War- war	**23,4**	**25,4**	**27,6**	**29,8**	**31,8**	**26,42**
	1	22	25	27	30	33	33,33
	2	23	26	29	31	34	32,35
	3	23	25	28	30	33	30,30
	4	24	27	30	32	35	31,43
F3	5	24	26	29	31	25	4,00
	War- war	**23,2**	**25,8**	**28,6**	**30,8**	**32**	**27,50**
	1	25	26	27	28	29	13,79
	2	24	25	26	27	28	14,29
	3	25	26	27	28	28	10,71
	4	24	24	25	25	26	7,69
F4	5	25	26	27	27	27	7,41
	War- war	**24,6**	**25,4**	**26,4**	**27**	**27,6**	**10,87**
	1	22	26	29	31	35	37,14
	2	23	26	30	32	36	36,11
	3	24	28	31	33	36	33,33
	4	24	27	30	34	37	35,14
F5	5	23	26	30	31	34	32,35
	War- war	**23,2**	**26,6**	**30**	**32,2**	**31,6**	**26,58**

Information :

F1: Moringa leaf extract lotion preparation with a concentration of 0.5% F2: Moringa leaf extract lotion preparation with a 2% concentration F3: Moringa leaf extract lotion preparation with a 5% concentration F4: Negative control or no treatment

F5: Positive control with Citra Hand Body Lotion

Table 6 shows the results of the moisture test of the Moringa leaf extract lotion preparation given to volunteers for 4 weeks. From the results of the observations it can be seen that the 0.5% concentration had a percent increase of 18%, the 2% concentration had a percent increase of 26.42% and for the concentration 5% has a percent increase of 27.50%. From these results, it can be seen that the highest percent increase in the effectiveness of skin moisture from the Moringa leaf extract lotion preparation was at a concentration of 5%.

Skin Moisture Normality Test Results

Table 7. Skin Moisture Research Data Normality Test Results

Group	*P Value*	Information
Concentration: 0.5%	0,119	Data Normal

Concentration: 2%	0,421	Data Normal
Concentration: 5%	0,125	Data Normal
Negative Control	0,814	Data Normal
Positive Control	0,814	Data Normal

Source: Primary Data 2023

Table 7 shows the results of the normality test using the Shapiro Wilk test. From the results of the normality test on the skin moisture data, it can be seen that the p value for all research groups has a p value > 0.05, which means that the data for all skin moisture concentration groups is normally distributed.

Skin Moisture Homogeneity Test Results

Table 8. Skin Moisture Data Homogeneity Test Results

Group	*P Value*	Information
Concentration: 0.5% Concentration: 2% Concentration: 5% Negative Control Positive Control	0,111	Homogeneous

Source: Primary Data 2023

Table 8 explains the results of the homogeneity test of skin moisture research data. It is known that the p value for each group in this study was 0.111 > 0.05, so it can be concluded that the variance of skin moisture data for all groups is homogeneous. With normal and homogeneous research data results, data analysis can be continued using the One Way Anova statistical test.

Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing the Skin

Table 9. Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing the Skin

Group	*P Value*
Concentration: 0.5%	0,000
Concentration: 2%	0,000
Concentration: 5%	0,011

Source: Primary Data 2023

Table 9 is the result of testing the effectiveness of the Moringa oleifera (Moringa oleifera) ethanol extract lotion formulation in moisturizing the skin. The research results show that the p value for each group in this study, namely concentrations of 0.5%, 2% and 5%, are all <0. 05 which shows that the ethanol extract of Moringa oleifera leaves at concentrations of 0.5%, 2% and 5% is effective in moisturizing the skin.

Test Results of the Similarity of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing the Skin

Table 10. One Way Anova *Test Results* Similarity of Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing Skin

Group	Mean ± SD	*P - Value*
Concentration: 0.5%	30,00 ± 1,000	
Concentration: 2%	31,80 ± 1,304	0,406
Control 5%	32,00 ± 4,000	

Source: Primary Data 2023

Based on the ANOVA output in table 9, it is known that the P - Value is 0.406 > 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract is the same in moisturizing the skin, seen from the average value for Moringa leaf ethanol extract which is the most

effective in Moisturizing the skin is Moringa leaf ethanol extract with a concentration of 5%, the average is 32.00 with a standard deviation value of 4,000.

The Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing Skin

Table 11. Results of Observation of the Effectiveness of Moringa Oleifera Ethanol Extract Lotion Formulation in Smoothing the Skin

F	Rat	Week 0	Week 1	Week 2	Week 3	Week 4	Percent Fineness
F1	1	33	30	29	27	26	21,21
	2	34	32	30	28	26	23,53
	3	33	32	28	28	26	21,21
	4	34	33	30	29	27	20,59
	5	34	32	29	28	26	23,53
	War- war	**33,6**	**31,8**	**29,2**	**28**	**26,2**	**22,02**
F2	1	34	31	29	26	24	29,41
	2	35	32	30	27	24	31,43
	3	35	32	29	26	24	31,43
	4	36	34	31	29	26	27,78
	5	34	30	28	26	23	32,35
	War- war	**34,8**	**31,8**	**29,4**	**26,8**	**24,2**	**30,46**

Source: Primary Data 2023 Description

F1: Moringa leaf extract lotion preparation with a concentration of 0.5% F2: Moringa leaf extract lotion preparation with a 2% concentration F3: Moringa leaf extract lotion preparation with a 5% concentration F4: Negative control or no treatment

F5: Positive control with Citra Hand Body Lotion

Table 11 explains the results of observing the smoothness of skin that has been given the formulation of Moringa oleifera (Moringa oleifera) ethanol extract lotion. From the observation results, data was obtained that the initial condition of the mice's skin smoothness was around normal conditions. After using the Moringa oleifera (Moringa oleifera) ethanol extract lotion formulation, all formula groups showed an increase in skin smoothness with an average percentage increase, namely, F1 of 22.02%, F2 of 30.46%, and F3 of 44.44% where at a concentration of 5% showed the highest average increase in skin smoothness, namely 44.44%.

Skin Smoothing Normality Test Results

Table 12. Normality Test Results of Skin Smoothing Research Data

Group	*P Value*	Information
Concentration: 0.5%	0,083	Data Normal
Concentration: 2%	0,135	Data Normal
Concentration: 5%	0,146	Data Normal
Negative Control	0,314	Data Normal
Positive Control	0,076	Data Normal

Source: Primary Data 2023

Table 12 shows the results of the normality test using the Shapiro Wilk test. From the results of the normality test on skin smoothness data, it can be seen that the p value for all research groups has a p value > 0.05, which means that the data for all concentration groups in skin smoothing is normally distributed.

Skin Moisture Homogeneity Test Results

Table 13. Skin Smoothing Data Homogeneity Test Results

Group	*P Value*	Information
Concentration: 0.5% Concentration: 2% Concentration: 5%	0,494	Homogeneous

Negative Control	
Positive Control	

Source: Primary Data 2023

Table 13 explains the results of the homogeneity test of the skin smoothing research data. It is known that the p value for each group in this study was 0.494 > 0.05, so it can be concluded that the variance of the skin smoothing data for all groups is homogeneous. With normal and homogeneous research data results, data analysis can be continued using the One Way Anova statistical test.

Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing the Skin

Table 14. Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing the Skin

Group	*P Value*
Concentration: 0.5%	0,000
Concentration: 2%	0,000
Concentration: 5%	0,000

Source: Primary Data 2023

Table 14 is the result of testing the effectiveness of Moringa oleifera lotion formulation in smoothing the skin, from the results of the study showed that the p value of each research group was 0.5%, 2% and 5% concentrations < 0.05 which showed that Moringa leaf ethanol extract (Moringa oleifera) at concentrations of 0.5%, 2% and 5% had effectiveness in smoothing the skin.

Test Results of the Similarity of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing the Skin

Table 15. One Way Anova *Test Results* Similarity of Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing Skin

Group	Mean ± SD	*P - Value*
Concentration: 0.5%	26,20 ± 1,000	
Concentration: 2%	24,20 ± 1,304	0,000
Control 5%	21,00 ± 4,000	

Source: Primary Data 2023

Based on the ANOVA output in table 15, it is known that the *P – Value* value of 0.000 < 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract differs significantly in smoothing the skin, judging from the average value for Moringa leaf ethanol extract which is most effective in moisturizing the skin is Moringa leaf ethanol extract with an average concentration of 5% of 21.00 with a standard deviation value of 4,000.

The Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Shrinking Pores

Table 16. Results of Observation of the Effectiveness of Moringa Oleifera Ethanol Extract Lotion Formulation in Shrinking Skin Pores

F	Rat	Week 0	Week 1	Week 2	Week 3	Week 4	Percent Decrease
F1	1	35	32	30	28	27	22,86
	2	36	34	32	30	28	22,22
	3	35	34	30	30	28	20,00
	4	36	35	32	31	28	22,22
	5	35	33	30	29	27	22,86
	War- war	**35,4**	**33,6**	**30,8**	**29,6**	**27,6**	**22,03**
F2	1	36	33	31	28	25	30,56
	2	37	34	32	29	26	29,73
	3	37	34	31	28	25	32,43
	4	37	35	32	30	27	27,03
	5	36	32	30	28	25	30,56
	War- war	**36,6**	**33,6**	**31,2**	**28,6**	**25,6**	**30,05**
	1	37	31	29	27	22	40,54

F3	2	37	31	28	27	20	45,95
	3	35	32	30	27	23	34,29
	4	35	33	31	27	22	37,14
	5	36	34	31	29	26	27,78
	War- war	**36**	**32,2**	**29,8**	**27,4**	**22,6**	**37,22**
F4	1	30	30	29	29	28	6,67
	2	33	32	31	31	30	9,09
	3	33	33	32	32	31	6,06
	4	31	30	30	30	29	6,45
	5	31	30	29	28	27	12,90
	War- war	**31,6**	**31**	**30,2**	**30**	**29**	**8,23**
F5	1	37	32	30	25	21	43,24
	2	38	34	30	26	22	42,11
	3	36	30	27	23	19	47,22
	4	36	31	28	24	21	41,67
	5	35	30	26	22	18	48,57
	Instalment-instalment	**36,4**	**31,4**	**28,2**	**24**	**20,2**	**44,51**

Source: Primary Data 2023

Information :

F1: Moringa leaf extract lotion preparation with a concentration of 0.5% F2: Moringa leaf extract lotion preparation with a 2% concentration F3: Moringa leaf extract lotion preparation with a 5% concentration F4: Negative control or no treatment

F5: Positive control with Citra Hand Body Lotion

Table 16 explains the results of observations on the effectiveness of ethanol extract of Moringa oleifera leaves in shrinking the skin. From the observation results, data was obtained that the initial condition of the mouse skin pores was around normal conditions. After using the Moringa oleifera (Moringa oleifera) ethanol extract lotion formulation, all formula groups showed skin pore reduction with an average percentage, namely, F1 of 22.03%, F2 of 30.05%, and F3 of 37.22% where in a concentration of 5% showed the highest average skin pore reduction, namely, 37.22%.

Skin Smoothing Normality Test Results

Table 17. Normality Test Results of Skin Pore Research Data

Group	*P Value*	Information
Concentration: 0.5%	0,106	Data Normal
Concentration: 2%	0,096	Data Normal
Concentration: 5%	0,607	Data Normal
Negative Control	0,967	Data Normal
Positive Control	0,490	Data Normal

Source: Primary Data 2023

Table 17 shows the results of the normality test using the *Shapiro Wilk* test, from the results of the normality test on skin pore reduction data, it can be seen that the p value of all research groups has a p value of > 0.05 which means that the data on all concentration groups in the skin pore are normally distributed.

Skin Moisture Homogeneity Test Results

Table 18. **Skin Pore Data Homogeneity Test Results**

Group	*P Value*	Information
Concentration: 0.5% Concentration: 2% Concentration: 5% Negative Control Positive Control	0,160	Homogeneous

Source : Primary Data 2023

Table 18 explains the results of the homogeneity test of skin pore research data, it is known that the p value for each group in this study is 0.160 > 0.05, so it can be concluded that the variance of skin pore data for all groups is homogeneous. With normal and homogeneous research data results,

data analysis can be continued using *the One Way Anova statistical test.*

Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing the Skin

Table 19. Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Shrinking Skin Pores

Group	*P Value*
Concentration: 0.5%	0,000
Concentration: 2%	0,000
Concentration: 5%	0,000

Source: Primary Data 2023

Table 19 is the result of testing the effectiveness of Moringa oleifera lotion formulation in shrinking skin pores, from the results showed that the p value of each study group was 0.5%, 2% and 5% concentrations < 0.05 which showed that Moringa oleifera ethanol extract at concentrations of 0.5%, 2% and 5% had effectiveness in shrinking skin pores.

Test Results of the Similarity of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing the Skin

Table 20. One Way Anova *Test Results* Similarity of Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Smoothing Skin

Group	Mean ± SD	*P - Value*
Concentration: 0.5%	27,60 ± 0,548	
Concentration: 2%	25,60 ± 0,894	0,000
Control 5%	22,60 ± 2,191	

Source: Primary Data 2023

Based on the ANOVA output in table 20, it is known that the *P – Value* value of 0.000 < 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract differs significantly in shrinking skin pores, judging from the average value for Moringa leaf ethanol extract which is most effective in shrinking skin pores is Moringa leaf ethanol extract with an average concentration of 5%. The average is 22.60 with a standard deviation of 2.191.

The effectiveness of *Moringa oleifera* lotion formulation in reducing wrinkles

Table 21. Results of Observation of the Effectiveness of Moringa Oleifera (Moringa oleifera*) Ethanol Extract Lotion Formulation* in Shrinking Wrinkles

F	Rat	Week 0	Week 1	Week 2	Week 3	Week 4	Percent Decrease
F1	1	38	36	35	32	31	18,42
	2	39	38	36	34	33	15,38
	3	38	35	34	32	30	21,05
	4	37	36	34	33	31	16,22
	5	39	37	35	33	31	20,51
	War- war	38,2	36,4	34,8	32,8	31,2	18,32
F2	1	39	36	33	31	29	25,64
	2	37	35	32	29	27	27,03
	3	37	34	31	28	27	27,03
	4	37	35	31	29	26	29,73
	5	38	36	33	30	28	26,32
	Rata- rata	37,6	35,2	32	29,4	27,4	27,13
	1	38	36	32	29	25	34,21
	2	37	35	30	28	25	32,43
	3	39	35	32	29	26	33,33
	4	39	36	32	28	25	35,90
	5	36	33	29	26	22	38,89
	Rata- rata	37,8	35	31	28	24,6	34,92

1	39	39	38	38	37	5,13
2	40	40	38	37	37	7,50
3	40	34	39	39	38	5,00
4	40	39	39	38	37	7,50
5	38	37	36	36	35	7,89
Rata- rata	39,4	37,8	38	37,6	36,8	6,60
1	39	35	31	26	22	43,59
2	39	36	33	27	24	38,46
3	40	36	32	27	23	42,50
4	40	35	30	26	21	47,50
5	40	36	31	26	22	45,00
Rata- rata	39,6	35,6	31,4	26,4	22,4	43,43

Source: Primary Data 2023 Description

F1: Moringa leaf extract lotion preparation with a concentration of 0.5% F2: Moringa leaf extract lotion preparation with a concentration of 2% F3: Moringa leaf extract lotion preparation with a concentration of 5% F4 : Negative control or no treatment

F5: Positive Control with Citra Hand Body Lotion

Table 21 describes the observed effectiveness of *Moringa oleifera* ethanol extract in reducing wrinkles. After the use of *Moringa oleifera* lotion formulation, all formula groups showed a reduction in wrinkles on the skin with an average percentage, namely, F1 by 18.32%, F2 by 27.13%, and F3 by 34.92% where at a concentration of 5% showed the highest average reduction in skin wrinkles, namely, 34.92%.

Normality Test Results Reduce Wrinkles

Table 22. Research Data Normality Test Results Reduce Wrinkles

Group	*P Value*	Information
Concentration: 0.5%	0,135	Data Normal
Concentration: 2%	0,814	Data Normal
Concentration: 5%	0,144	Data Normal
Negative Control	0,135	Data Normal
Positive Control	0,814	Data Normal

Source: Primary Data 2023

Table 22 shows the results of the normality test using the *shapiro wilk* test, from the results of the normality test on the data reducing skin wrinkles, it can be seen that the p value of all research groups has a p value of > 0.05 which means that the data on all concentration groups in reducing wrinkles are normally distributed.

Homogeneity Test Results Reduce Wrinkles

Table 23. Data homogeneity test results reduce wrinkles

Group	*P Value*	Information
Concentration: 0.5% Concentration: 2% Concentration: 5% Negative Control Positive Control	0,954	Homogeneous

Source: Primary Data 2023

Table 23 explains the results of the homogeneity test of research data reducing wrinkles, known p value for each group in this study is 0.954 > 0.05, so it can be concluded that the data variance reducing skin wrinkles of all groups is homogeneous. With normal and homogeneous research data results, data analysis can be continued using *the One Way Anova statistical test.*

Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Reducing Wrinkles

Table 24. Test Results of the Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Reducing Wrinkles

Group	*P Value*
Concentration: 0.5%	0,000
Concentration: 2%	0,000
Concentration: 5%	0,000

Source: Primary Data 2023

Table 24 is the result of the test of the effectiveness of Moringa oleifera lotion formulation in reducing skin *wrinkles, from the results of the study showed that the p value of each study group was a concentration of 0.5%, 2% and 5% in total < 0.05 which showed that Moringa leaf ethanol extract (Moringa* oleifera*) at concentrations of 0.5%, 2% and 5% had effectiveness in reducing skin wrinkles.*

Results of the Similarity Test of the Effectiveness of Moringa Oleifera Ethanol Extract Lotion Formulation in Reducing Skin Wrinkles

Table 25. One Way Anova *Test Results* Similarity of Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Reducing Skin Wrinkles

Group	Mean ± SD	*P - Value*
Concentration: 0.5%	31,20 ± 1,095	
Concentration: 2%	27,40 ± 1,140	0,000
Control 5%	24,60 ± 1,517	

Source: Primary Data 2023

Based on the ANOVA output in table 25, it is known that the *P – Value* value of 0.000 < 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract differs significantly in reducing skin wrinkles, judging from the average value for Moringa leaf ethanol extract which is most effective in reducing skin wrinkles is Moringa leaf ethanol extract with an average concentration of 5% of 24.60 with a standard deviation value of 1.517.

The Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Increasing Collagen Fiber Density

Table 26. Test Results of the Effectiveness of Moringa oleifera *Ethanol Extract Lotion Formulation* in Increasing the Density of Collagen Fibers

Group	Mean ± SD	*P - Value*
Concentration: 0.5%	3,60 ± 0,548	
Concentration: 2%	4,00 ± 0,000	0,001
Control 5%	4,40 ± 0,548	

Source: Primary Data 2023

Table 26 shows the results on the effectiveness of Moringa oleifera lotion formulation in increasing collagen fiber density known P – *Value* 0.001 < 0.05, so it can be concluded that Moringa *oleifera* ethanol extract in concentrations of 0.5%, 2% and 5% is effective in increasing collagen fiber density, *and the effectiveness of each Moringa* leaf ethanol extract group differs in Increasing the density of collagen fibers, judging from the average value for Moringa leaf ethanol extract, the most effective in increasing collagen fiber density is Moringa leaf ethanol extract with an average concentration of 5% of 4.40 with a standard deviation value of 0.548.

The Effectiveness of Moringa oleifera Ethanol Extract Lotion Formulation in Moisturizing the Skin

The results of research regarding the effectiveness of Moringa oleifera (Moringa oleifera) leaf ethanol extract lotion formulations in moisturizing the skin show that a concentration of 0.5% has a percent increase of 18%, a concentration of 2% has a percent increase of 26.42% and a concentration of 5% has a percent increase of 27 .50%. From these results, it can be seen that the highest percent increase in the effectiveness of skin moisture from the Moringa leaf extract lotion preparation was at a concentration of 5%.

The results of the research show that the p value of each research group, namely concentrations of 0.5%, 2% and 5%, are all <0.05, which indicates that the ethanol extract of Moringa oleifera leaves at a concentration of 0.5%, 2% and 5% is effective in moisturizing the skin. Based on the ANOVA output, it is known that the P - Value is 0.406 > 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract is the same in moisturizing the skin, seen from the average value for Moringa leaf ethanol extract which is the most effective in moisturizing the skin. Moringa leaf ethanol extract with a concentration of 5% has an average of 32.00 with a standard deviation value of 4.000. The results of this research are in line with research conducted (Marlina, 2023) which shows that the facemist moisture test on normal skin is formula A of 11.76%, B of 12.50%, C of 16.37% and D of 38.45%. The percent moisture level for dry skin is formula A of 26.67%, B of 27.00%, C of 28.24% and D of 30.54%. So it can be concluded, the best formula is formula D with moisture test results on normal skin of 38.45% and on dry skin 30.54% with a microbial contamination test that meets quality requirements. . The same results were also obtained from research conducted by Sausan (2020) entitled using Moringa leaf extract lotion on skin moisture, where the results showed that there was an influence between using Moringa leaf extract lotion on skin moisture.

From these results, it can be concluded that the greater the amount of extract added to the cream base, the greater the vitamin E content in the Moringa leaf extract cream. Vitamin E is able to maintain water bonds in the skin, so that skin elasticity and flexibility is maintained. Apart from that, vitamin E also provides protection to the skin from the bad effects of ultraviolet rays, so that moisture is maintained and the skin does not dry out (Sugihartini, 2017). Moringa leaves can also treat dry skin due to insufficient intake of nutrient B2. Moringa leaves contain nutrient B2 which is useful for treating dry skin, maintaining skin moisture so that regular consumption of Moringa leaves can maintain skin moisture (Isnan, 2017).

Based on test results, Moringa Oleifera leaves with a concentration of 7.5% have an SPF value of 39.89, which is a good value for skin care against sunlight. Moringa leaves (Moringa Oleifera) contain phenolics which include flavonoids, flanolol, chlorogenic acid, elagic acid, and ferulic acid, and antioxidants which include vitamin A, vitamin B, vitamin C. Phenolics provide the best protection against enzymes that damage collagen and elastin in skin, β-carotene has been able to increase protein and collagen as well as DNA content and increase the thickening of the epidermis. Vitamin B can maintain skin moisture by drawing water into the stratum corneum to soften the skin (Dewi, 2017).

Effectiveness of Moringa Leaf (Moringa oleifera) Ethanol Extract Lotion Formulation in Smoothing Skin

The results of research regarding the effectiveness of Moringa oleifera (Moringa oleifera) leaf ethanol extract lotion formulations in smoothing the skin showed that all formula groups showed an increase in skin smoothness with an average percentage increase, namely, F1 of 22.02%, F2 of 30.46%, and F3 amounting to 44.44%, where the 5% concentration showed the highest average increase in skin smoothness, namely 44.44%.

The results of the research show that the p value of each research group, namely concentrations of 0.5%, 2% and 5%, are all <0.05, which indicates that the ethanol extract of Moringa oleifera leaves at a concentration of 0.5%, 2% and 5% is effective in smoothing the skin. Based on the ANOVA output, it is known that the P - Value is 0.000 < 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract is significantly different in smoothing the skin, seen from the average value for Moringa leaf ethanol extract which is the most effective in moisturizing skin is Moringa leaf ethanol extract with a concentration of 5%, the average is 32.00 with a standard deviation value of 4,000.

The results of this research are in line with research conducted by Nining (2017) entitled Moringa leaf extract cream formulation as an antiaging preparation, the results of which show that the ethanol extract cream formula can be used to soften the skin.

Moringa leaves contain various chemical compounds which are classified as antioxidants consisting of tannins, flavonoids, steroids, alkaloids and quercetin which are beneficial for body and skin health (Tunas et al., 2019). Apart from its antioxidant content, Moringa leaves also have a variety of nutritional content consisting of protein, minerals and beta carotene which are beneficial for skin health (Gitariastuti et al., 2020).

Effectiveness of Moringa Leaf (Moringa oleifera) Ethanol Extract Lotion Formulation in Shrinking Pores

The results of research regarding the effectiveness of the Moringa oleifera leaf ethanol extract lotion formulation in shrinking skin pores showed that after using the Moringa oleifera leaf ethanol extract lotion formulation, all formula groups showed skin pore reduction with an average percentage, namely, F1 of 22 .03%, F2 was 30.05%, and F3 was 37.22% where at a concentration of 5% it showed the highest average skin pore reduction, namely, 37.22%.

The results of the research show that the p value of each research group, namely concentrations of 0.5%, 2% and 5%, is all <0.05, which shows that the ethanol extract of Moringa oleifera leaves at a concentration of 0.5%, 2% and 5% is effective in shrinking skin pores. Based on the ANOVA output, it is known that the P - Value is 0.000 < 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract is significantly different in shrinking skin pores, seen from the average value for Moringa leaf ethanol extract which is the most effective in To shrink skin pores, Moringa leaf ethanol extract with a concentration of 5% has an average of 22.60 with a standard deviation value of 2.191.

The results of this research are in accordance with Ella's (2020) research entitled the use of Moringa leaves as an antioxidant organic facial mask where the results of her research show that Moringa leaves contain vitamins A, B1, B2, C and E, as well as the benefits of Moringa leaves, namely hydrating dry skin, overcoming acne, reduces excess oil on the face, reduces signs of aging, forms natural collagen in the skin, removes dead skin cells, reduces skin pores, removes black spots

The Moringa plant (Moringa oleifera) is a type of tropical plant that is easy to grow in tropical areas like Indonesia. Moringa leaves grow easily in a variety of soil conditions. Moringa leaves contain many high antioxidants because Moringa leaves contain ascorbic acid, flavonoids, phenolics and caratenoids. Moringa leaves can be used as a basic ingredient in making cosmetics. Masks are one of the cosmetics to make facial skin brighter.

Pores can become enlarged due to sun exposure, acne scars and so on. To keep your face clean, apply a Moringa leaf mask to shrink the pores so that they don't become a place for dirt and blackheads to accumulate, or even become a place for acne to grow (Adhe, 2019). The anti-inflammatory and antibacterial content in Moringa leaves helps reduce acne. Moringa leaves also help clean pores and reduce excess oil production, so the skin becomes cleaner and free from acne. Moringa leaves are effective in shrinking pores on the face. This is because the content of vitamin A and vitamin C in Moringa leaves is quite large. These two vitamins will then help remove dirt from the pores and help reduce blockages. So the skin pores will become smaller (Sugihartini, 2017).

Effectiveness of Moringa Leaf (Moringa oleifera) Ethanol Extract Lotion Formulation in Reducing Wrinkles

The results of research regarding the effectiveness of the Moringa oleifera leaf ethanol extract lotion formulation in reducing skin wrinkles showed that after using the Moringa oleifera leaf ethanol extract lotion formulation, all formula groups showed a reduction in skin wrinkles with an average percentage, namely, F1 of 18.32%, F2 was 27.13%, and F3 was 34.92% where at a concentration of 5% it showed the highest average reduction in skin wrinkles, namely, 34.92%.

The results of the research show that the p value of each research group, namely concentrations of 0.5%, 2% and 5%, is all <0.05, which shows that the ethanol extract of Moringa oleifera leaves at a concentration of 0.5%, 2% and 5% is effective in reducing skin wrinkles. Based on the ANOVA output, it is known that the P - Value is 0.000 < 0.05, so it can be concluded that the effectiveness of each group of Moringa leaf ethanol extract is significantly different in reducing skin wrinkles, seen from the average value for Moringa leaf ethanol extract which is the most effective in reducing skin wrinkles. reducing skin wrinkles is the ethanol extract of Moringa leaves with a concentration of 5%, the average is 24.60 with a standard deviation value of 1.517. This research is in line with research conducted by Baldisserotto et al., (2018) which states that Moringa oleifera leaves can be used as a UV filter, antioxidant and antihyperproliferative as well as reducing wrinkles on the skin, so Moringa leaves can be used to protect against skin aging. , brightens the skin, protects against radiation exposure, protects against skin damage, moisturizes the skin and can also be used to rejuvenate the skin. These various uses make Moringa leaves suitable for use as an additional ingredient in moisturizers (Baldisserotto et al., 2018).

Moringa oil and Moringa leaves can be used for facial masks because they can prevent wrinkles on the face and fight skin damage due to free radicals. Moringa leaves can tighten the skin and make the face youthful (Adhe, 2019). Moringa leaves show extraordinary anti-aging effects, Moringa leaf extract is a very promising natural source of anti-aging skin ingredients, which can be further explored in the cosmetics industry and cosmetics that combat skin aging and wrinkles (Yongbing, 2022).

Effectiveness of Moringa Leaf (Moringa oleifera) Ethanol Extract Lotion Formulation in Increasing Collagen Fiber Density

The results of research on the effectiveness of the ethanol extract lotion formulation of Moringa oleifera leaves in increasing the density of collagen fibers have been completed, the results of which show that the effectiveness of the ethanol extract lotion formulation of Moringa oleifera leaves in increasing the density of collagen fibers is known to have a P value of 0.001 < 0, 05, so it can be concluded that the ethanol extract of Moringa oleifera leaves in concentrations of 0.5%, 2% and 5% is effective in increasing the density of collagen fibers, and the effectiveness of each group of Moringa leaf ethanol extract is different in increasing the density of collagen fibers, as seen From the average value for Moringa leaf ethanol extract, the most effective in increasing collagen fiber density is Moringa leaf ethanol extract with a concentration of 5%, the average is 4.40 with a standard deviation value of 0.548.

The results of this research are in line with research conducted by Atika (2017) entitled the effect of giving ethanol extract of Moringa leaves on the density of collagen fibers in the wound healing process in mice where the results show that giving ethanol extract of Moringa oleiferadose 50 mg/day and 100 mg/day can increase density. Collagen fibers 5 days after incision in deep wounds of Rattus novergicus.

Moringa oleifera is a plant that is often found in Indonesia and is one of the traditional medicines. In Indonesia, Moringa oleifera is usually used as a hedge plant to border the land. Moringa oleifera has therapeutic properties and has been used by ancient people to care for the skin and also has properties in the wound healing process. Moringa oleifera can speed up the process of compacting collagen fibers and closing wounds (Atika, 2017)

4. Conclusion

(1) the three concentrations of Moringa oleifera leaf ethanol extract produced produce a distinctive aroma, have a soft texture, spread easily, form a semi-solid or gel consistency, and do not feel sticky; (2) The observation results show that the three cream formulation concentrations are physically homogeneous, this shows that the ingredients used in making the cream are mixed perfectly; (3) The 0.5% concentration has an average pH and STD value of 6.32 ± 0.06, a 2% concentration has an average pH and STD value of 6.30 ± 0.06, and a 2% concentration has an average value The pH and STD are 6.28 ± 0.00. From these results it can be said that the pH value is still within the ideal pH range; (4) A concentration of 5% has the most dominant or greatest spreadability value compared to concentrations of 0.5% and 2%. From these results it can be concluded that the greater the concentration of the Moringa leaf ethanol extract preparation, the greater the area of distribution produced due to an increase viscosity; (5) The average adhesion value at a concentration of 0.5% is 42.05, at a concentration of 2% the average is 55.84 and at a concentration of 5% the average is 77.72%. From the results of the average value obtained from the three concentrations above, the three concentrations in this study fall into the adhesive strength range of 2.00 - 300.00 seconds, where this adhesive strength is a requirement for good cream adhesive strength; (6) Lotion formulation of ethanol extract of Moringa leaves (Moringa oleifera) in 0.5% preparation is effective in moisturizing the skin; (7) The 2% ethanol extract lotion formulation of Moringa oleifera leaves is effective in moisturizing the skin; (8) The 5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in moisturizing the skin; (9) The 0.5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in smoothing the skin; (10) The 2% ethanol extract lotion formulation of Moringa oleifera leaves is effective in smoothing the skin; (11) The 5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in smoothing the skin; (12) Lotion formulation of ethanol extract of Moringa leaves (Moringa oleifera) in 0.5% preparation is effective in shrinking pores; (13) The 2% ethanol extract lotion formulation of Moringa oleifera leaves is effective in shrinking pores; (14) The 5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in shrinking pores; (15) The 0.5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in reducing wrinkles; (16) The 2% ethanol extract lotion formulation of Moringa oleifera leaves is effective in

reducing wrinkles; (17) The 5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in reducing wrinkles; (18) Lotion formulation of ethanol extract of Moringa leaves (Moringa oleifera) in 0.5% preparation is effective in increasing the density of collagen fibers; (19) The 2% ethanol extract lotion formulation of Moringa oleifera leaves is effective in increasing the density of collagen fibers; (20) The 5% ethanol extract lotion formulation of Moringa oleifera leaves is effective in increasing the density of collagen fibers; (21) The concentration of Moringa oleifera leaf extract in the lotion formulation that is effective in moisturizing the skin is a concentration of 5%. The concentration of Moringa leaf extract (*Moringa oleifera) in the* formulation of lotion preparations that are effective in smoothing the skin is a concentration of 5%. The concentration of Moringa leaf extract (*Moringa oleifera*) in the formulation of lotion preparations that are effective in shrinking skin pores is a concentration of 5%. The concentration of Moringa leaf extract (*Moringa oleifera*) in the formulation of lotion preparations that are effective in reducing wrinkles on the skin is a concentration of 5%. The concentration of Moringa leaf extract (*Moringa oleifera*) in the formulation of lotion preparations that are effective in increasing collagen fibers is a concentration of 5%.

Suggestion

The suggestions that can be given from the results of the research that have been carried out are as follows:

For the World of Beauty

From the results that have been carried out, there are many benefits obtained from the ethanol extract of Moringa leaves in terms of skin health, it is recommended that the world of beauty can utilize the ethanol extract of Moringa leaves as the main ingredient in making creams, both creams for facial skin and creams for body skin, which can be utilized. Natural ingredients such as Moringa leaves will minimize the negative impact on users of chemicals which are usually used as ingredients in making beauty products.

For the Community

People can use natural ingredients found in their living environment as ingredients for healthy skin, one of which is using Moringa leaves which are proven to have various benefits for the skin. People who want to use natural ingredients as an alternative for maintaining healthy skin must also first confirm the ingredients. -any ingredients that actually have good benefits and have been proven to be good for skin health, one of which is Moringa leaves which can be used as an addition to a body scrub where the Moringa leaves are first crushed before application.

For Further Researchers

For future researchers who want to conduct research on the benefits of Moringa leaves, they can do so by looking at the benefits of Moringa leaves for other things, such as Moringa leaves as an anti-acne agent, and can also conduct research on the benefits of Moringa leaves as a sunscreen, as well as carrying out phytochemical screening tests to find out. What are the contents of Moringa leaves so that research on the benefits of Moringa leaves can be more perfect in the future.

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