FORMULATION OF LIPBALM FROM SARI MEAT PAPAYA FRUIT (Carica papaya L.) AS A PREPARATION SUNBLOCK

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ABSTRACT

This study aims to determine whether papaya pulp can be formulated as a lipbalm preparation, how the physical stability of the preparation is and whether it can be efficacious as a sunscreen.

This research uses quantitative research which is carried out experimentally in a laboratory and uses a simple random sampling research design.

The results showed that papaya pulp extract can be formulated as lipbalm preparation, then the formulation of lipbalm preparations with concentrations of 5%, 7.5% and 10% can affect the physical stability of the preparation and papaya pulp extract with a concentration of 5% produces an SPF value of 5.912, 7.5% 7,841 and 10% 12,591. Based on the results of the study, the three lipbalm preparations made can be efficacious as sunscreen preparations but provide low protection.

Keywords: Papaya juice, Lipbalm, Sunscreen

INTRODUCTION

Indonesia is known as a tropical country, where the influence of sunlight is very large on the lives of living things. Sun exposure can have both good and bad effects on humans depending on the wavelength of sunlight, the frequency of exposure, and the intensity of exposure to sunlight.

Sun exposure can have both good and bad effects on humans depending on the wavelength of sunlight, the frequency of exposure, and the intensity of exposure to sunlight. The effect is different for each individual depending on the sensitivity. Exposure to the sun's UV rays can damage the lip's keratin cells, which protect the lips. The damaged keratin cells will exfoliate. In this condition, the lips will look chapped.

rupture and this process will continue until all the damaged cells are replaced by new cells.

Based on the problems caused by exposure to the sun, protection is needed either physically by covering the body or chemically by utilizing the use of sunscreens, both sunscreens derived from synthetic compounds or compounds derived from nature. However, products that use synthetic materials can cause adverse effects such as toxicity associated with anaphylaxis. Therefore, it is necessary to develop a sunscreen product that comes from nature. One of the plants that comes from nature is papaya.

Papaya *(Carica papaya L.)* is a local plant that is empirically used to treat skin rashes and sunburn due to excessive sun exposure. The part of the papaya plant that is widely used is the flesh.

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Papaya flesh is reported to contain -tocopherol compounds, ascorbic acid (vitamin C), beta carotene, vitamin B1, and niacin [16].

In addition, papaya also contains secondary metabolites such as flavonoids, polyphenols, alkaloids and tannins which have the potential as antioxidants. Flavonoids are compounds that have been shown to have antioxidant activity that has the potential as a sunscreen.

Papaya fruit has a high content of antioxidants, such as Vitamin C, Folate, Vitamin A, Minerals, Magnesium, Vitamin E, Potassium, Fiber and Vitamin B [28].

The chemical content of papaya fruit is flavonoid which is suspected as an active ingredient in sunscreen. Flavonoids are also antioxidants that are believed to be able to prevent the harmful effects of UV rays so that they can be used to reduce skin damage.

Therefore, flavonoids derived from combined biosynthesis consist of shikimic acid-derived units and polyketide pathways [15].

Phenolic compounds, especially the flavonoid group, have potential as sunscreens due to the presence of a chromophore group (conjugated single double bond) which is able to absorb UV rays, both UV A and UV B, thereby reducing the intensity on the skin.

Sunscreens are cosmetic ingredients that physically or chemically inhibit the penetration of UV rays into the skin. Sunscreen can absorb at least 85% of sunlight at a wavelength of 290-320 nm for UVB and can transmit sunlight at a wavelength of more than 320 nm for UVA.

The active ingredients that are commonly used as sunscreens are divided into two, namely physical sunscreens and chemical sunscreens. Physical sunscreens work by reflecting ultraviolet radiation, their ability is based on particle size and layer thickness, can penetrate the dermis to the subcutaneous or hypodermis layers and are effective in the UV-A, UV-B and visible radiation spectrums.

While chemical sunscreens work by absorbing ultraviolet radiation and converting it into a form of heat energy, it can absorb almost 95% of UV-B radiation which can cause sunburn (erythema and wrinkles) [22].

SPF is a universal indicator that explains the effectiveness of a product or substance that is UV protector, the higher the SPF value of a sunscreen product or active substance, the more effective it is to protect the skin from the adverse effects of UV rays [6].

The method of measuring the SPF value in vitro is generally divided into two types. The first type is by measuring the absorption or transmission of UV radiation through a layer of sunscreen products on a quartz plate or biomembrane. The second type is to determine the absorption characteristics of the sunscreen using spectrophotometric analysis of the diluted solution of the tested sunscreen.

The classification of SPF values according to the European Commission (EC) Recommendation is as follows (Osterwalder and Herzog, 2009): 1. Sunscreen with an SPF value of 6-10 provides low protection, 2. Sunscreen with an SPF value of 15-25 provides protection, 3. Sunscreen with an SPF value of 30-50 provides high protection, 4. Sunscreen with an SPF value of 50+ provides very high protection. The higher the desired SPF value, the higher the amount of active sunscreen ingredients needed as well.

Based on the results of research that has been carried out on the preparation of sunscreen lotion, papaya pulp extract *(Carica papaya L.)* with various extract concentrations produces an SPF value of 28,517 at a concentration of 5% and is

categorized as the best protection. Therefore, researchers want to formulate other cosmetic preparations, for example, lipbalm preparations.

Cosmetics according to the Regulation of the Minister of Health of the Republic of Indonesia No. 1175/MENKES/PER/VIII/2010, concerning Cosmetics Production Permit, Cosmetics are materials or preparations intended for use on the external parts of the human body (epidermis, hair, nails, lips and external genital organs) or teeth and oral mucous membranes, especially to cleanse, perfume, change appearance and correct body odor or protect and maintain the body in good condition [1].

In its development in the modern era, cosmetics now have the main purpose of personal hygiene, increasing attractiveness through make-up, increasing self-confidence, protecting skin and hair from UV damage, pollution and other environmental factors, preventing premature aging and generally helping someone values life more [4].

Based on their use, cosmetics are divided into 2 groups, namely Skin Care Cosmetics and Makeup Cosmetics (decorative or make-up).

Types of skin care cosmetics consist of (cleanser): for example soap, cleansing cream, cleansing milk and skin freshener (freshener); cosmetics to moisturize the skin (moisturizer): for example, moisturizing cream, night cream, anti-wrinkle cream, lip balm; skin protective cosmetics, such as sunscreen cream and sunscreen foundation, sun block cream/lotion; cosmetics to thin or sand the skin (peeling), such as scrub cream [4].

Meanwhile, the type of make-up (decorative or make-up) is needed to apply makeup and cover blemishes on the skin so as to produce a more attractive appearance and have a good psychological effect [4].

Cosmetics Moisturizers or moisturizers are ingredients that are applied to the skin, which aims to prevent, or treat dry skin. In addition, moisturizer also aims to improve and maintain skin integrity, maintain the barrier system (skin protection) so that the skin is expected to always be in a healthy and good condition, especially in supporting the skin's function as the body's defense system from various kinds of external disturbances [2].

Lipbalm is a cosmetic preparation that is applied to the lips to function as a moisturizer and skin protector, especially the lips so that they are protected from the sun by forming an immiscible oil layer on the surface of the lips. The layer formed by the lip balm is a protective layer of the lips from outside influences. The reason for choosing lipbalm preparations is because lipbalm is easy to apply and can prevent lip skin damage [3].

Based on this, the researcher is interested in conducting further research on the formulation of lipbalm preparations from the pulp of papaya (Carica Papaya L.) as a sunscreen preparation.

RESEARCH METHODS

This type of research is a quantitative research conducted experimentally in a laboratory and this research uses a simple random sampling research design.

This research was carried out from August to October 2021 at the Pharmaceutical Technology Laboratory, Faculty of Science, Technology and Health Sciences, University of Bina Mandiri Gorontalo.

The population in this study was the California papaya which grew in Meranti village, Tapa sub-district, Bone Bolango district, Gorontalo province, which obtained 500 grams of papaya fruit and the sample used by the researcher was 225 ml of papaya juice obtained from papaya fruit.

1. Data collection technique

Measuring Cup (Pyrex®), Water bath (HH-S6), pH meter (ATC), Analytical balance (Sartorius), oven (Memmert), UV-Vis Spectrophotometer and necessary glassware. Papaya pulp, cera alba, glycerin, methyl paraben, propyl paraben (Barataco®), BHT, Ethanol, Magnesium, concentrated HCl and filter paper.

2. Sample Setup

The sample used was papaya fruit by hand picking. samples obtained as much as 500 gr. The collected samples were then cleaned of dirt, then peeled, set aside the papaya seeds and washed with clean water then cut into pieces, then blended, after that filtered using a filter cloth and obtained papaya juice as much as 225 ml.

3. Phytochemical Screening

A total of 1 ml of papaya juice was put into a test tube, then 2 drops of ethanol were added, then shaken until homogeneous, then 0.1 mg of magnesium powder, 2 drops of concentrated HCl were added. If a yellow, orange or red color is formed, then papaya juice contains flavonoid compounds [6].

As much as 1 ml of papaya juice was put into a test tube then added 2 drops of $FeCl_3$ 10%. If the solution is green, purple, blue or black, then papaya juice is positive for tannins [6].

A total of 1 ml of papaya juice was put into a test tube then added 10 ml of hot water then cooled and shaken for 10 seconds. After shaking, if the solution causes foam as high as 1-10 cm for not less than 10 minutes and then drops of 2N HCl, the foam does not disappear, then papaya juice is positive for saponins [6].

The formula design can be seen in table 1.

Table 1. Papaya Flesh Juice Lipbalm Formula Design

Ingredient	Concentration (%)			
	F0	F1	F2	F3
Papaya pulp		5	7.5	10
Cera alba	10	10	10	10
Glycerin	5	5	5	5
Methyl paraben	0.02	0.02	0.02	0.02
Propyl paraben	0.18	0.18	0.18	0.18
BHT	0.05	0.05	0.05	0.05
Oleum cacao ad	10	10	10	10

Source: Data Processed, 2021

4. Preparation of Lipbalm

Weighed cacao oleum, propyl paraben, BHT and cera alba (Mass 1) then cacao oleum was melted over a water bath at a temperature of 62-65° C until it melted completely. Then mix propyl paraben, BHT and cera alba into cacao oleum. Next, the methyl paraben and glycerin (Mass 2) were weighed. Then mix Mass 1 and Mass 2, then add the papaya pulp, stir until homogeneous. After that, put the lipbalm in a container and leave it at room temperature until it freezes [3].

Physical Stability Test for Lipbalm

a) Organoleptic Test

The finished lipbalm preparations were stored at room temperature and observations were made on each preparation which included observations of color, odor, and dosage form [10].

b) pH test

Determination of the pH of the preparation is carried out using a pH meter by means of first calibrating the instrument using a neutral standard buffer solution (pH 7.01) and an acid buffer solution (pH 4.01) until the instrument shows the pH value. Then the electrodes were washed with distilled water, then dried with a tissue. The sample was made in a concentration of 1%, which was

weighed 1 g of the preparation and dissolved in 100 ml of distilled water, then heated. After the solution temperature is normal, the electrode is immersed in the solution. Let the tool show the pH value until it is constant. The desired pH of the preparation is in accordance with the lip pH, which is in the range of 4.5-8 [20].

c) Melting Point Test

The method of observing the melting point of the lipbalm is done by putting the lipbalm into the oven with an initial temperature of 500 C for 15 minutes, observing whether it melts or not, after that it is increased by 10 C every 15 minutes and observed at what temperature the lipbalm begins to melt [22].

Conditions The ideal lip balm melting temperature is actually set to a temperature close to the lip temperature, varying between 36-380C. However, due to the need to pay attention to the resistance factor to the surrounding weather temperature, especially the temperature of the tropics, the melting temperature of lip balm is made high, which is in the range of 50- 700 C [31].

d) Homogeneity Test

Homogeneity test was carried out using an object glass. A number of samples were smeared on a slide then closed and pressed with another slide, then observed the homogeneity of the sample which did not show any coarse grains from the preparation [21].

Determination of Prescription SPF Value

Determination of the effectiveness of sunscreen preparations is carried out by determining the SPF value in vitro using the UV-VIS spectrophotometry method:

a) Sample Setup

Lipbalm preparation is weighed as much as 1 g. Each lipbalm was transferred to a 100 ml volumetric flask and then diluted with 70% ethanol. Ultrasonication was carried out for 5 minutes and then filtered with filter paper then the first 10 ml of the filtrate was discarded. A total of 5 ml of the solution was pipetted, put into a 25 ml volumetric flask, then diluted with 70% ethanol after which the samples were ready to be analyzed to determine the SPF value for each sample [19].

The samples tested in determining the SPF value consisted of: Formula 0 (lipbalm base), Formula I (5% papaya pulp extract), Formula II (7.5% papaya pulp juice), Formula III (10% papaya pulp extract)).

b) Determination of SPF Value

Determination of the SPF value of the cream was measured by UV-Vis spectrophotometer using 70% ethanol as a blank. The absorption of the test solution was measured in the wavelength range of 290-320 nm with 5 nm intervals. The SPF value of lipbalm preparations was analyzed in vitro using the Mansur method with the following equation:

$$\text{SPF} = CF \; x \sum_{290}^{320} \text{EE}\ (\lambda)\ x\ I\ (\lambda)\ x\ A\ (\lambda)$$

Description :

EE = Erythemal effect spectrum
I = Intensity of the light spectrum
A = Absorption of sunscreen products
CF = correction factor [10]

Data Analysis Techniques

The research data were analyzed using the SPSS 16.0 program. The first step was to analyze the data using the Kolmogorov-Smirnov method to determine homogeneity and normality. Then if the data is normal, it is continued to be analyzed using the One Way Anova method to determine the average difference between groups. If there is a difference, it is continued with the Post

Hoc Tukey HSD test to see the difference between treatments. Meanwhile, if the data is not normal, it is continued with analysis using the Kruskal Wallis method to determine the average difference between groups. If there is a difference, it is continued with the Post Mann-Whitney test to see the difference between treatments.

RESEARCH RESULT

This California papaya *(Carica papaya L.)* was obtained from plantations in Gorontalo Province, Bone Bolango Regency, Tapa District, Meranti Village.

The results of phytochemical screening can be seen in table 2

Table 2. Phytochemical Screening Results

Compound	Checker	Results
Flavonoids	NaOH	Yellow color
Saponins	HCL	Foam is formed
Tannins	FeCl3	No green color formed

Source: Data Processed, 2021

Results of Evaluation of Lipbalm Preparations

a) Organoleptic Test

Table 3. Organoleptic Test Results

Concentration	Color	Smell	Shape
F0	Yellow	Typical base	Good
F1	Yellow	Papaya juice special	Good
F2	Yellow	Papaya juice special	Good
F3	Yellow	Papaya juice special	Good

Source: Data Processed, 2021

Description :

F0 : Lipbalm formula without papaya juice (negative control)

F1 : Libalm formula with 5% papaya juice concentration

F2 : Libalm formula with 7.5% papaya juice concentration

F3 : Libalm formula with 10% papaya juice concentration

Based on table 3. the results of the organoleptic test of the lipbalm preparation produced at F0 have a characteristic odor of the base, yellow color and good shape. Meanwhile, F1, F2, and F3 have a distinctive smell of papaya juice, yellow color and good shape.

b) Homogeneity Test

Table 4. Homogeneity Test Results

Concentration	Homogeneity
F0	Homogeneous
F1	Homogeneous
F2	Homogeneous
F3	Homogeneous

Source: Data Processed, 2021

Description :

F0 : Lipbalm formula without papaya juice (negative control)

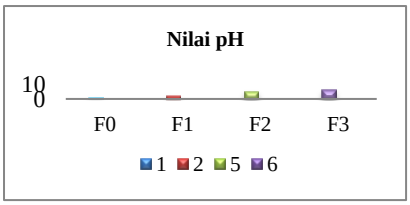
F1 : Libalm formula with 5% papaya juice concentration

F2 : Libalm formula with 7.5% papaya juice concentration

F3 : Libalm formula with 10% papaya juice concentration

Based on table 4. the results of the homogeneity test at F0, F1, F2, and F3 showed that all lipbalm preparations were homogeneous, which did not show any coarse granules from the preparation [5].

c) pH Test Results



Graph 1. pH Test Results

Source: Data Processed, 2021

Description :

F0 : Lipbalm formula without papaya juice (negative control)

F1 : Libalm formula with 5% papaya juice concentration

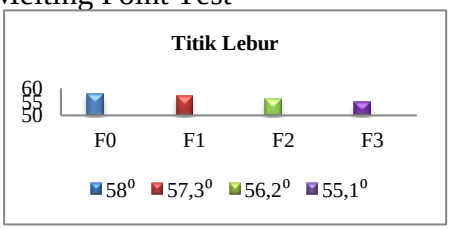
F2 : Libalm formula with 7.5% papaya juice concentration

F3 : Libalm formula with 10% papaya juice concentration

Based on graph 1, the pH test results on F0 and F1 show that both formulas produce very low pH values ranging from

1-2, while F2 and F3 produce good pH values ranging from 5-6. The pH of the preparation must be in the range of 4.5-8 (Rawlin, 2003), based on the above results, F2 and F3 have met the requirements for a good pH value.

d) Melting Point Test

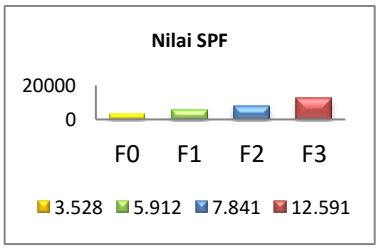


Graph 2. Melting Point Test Results
Source: Data Processed, 2021

Description :
F0 : Lipbalm formula without papaya juice (negative control)
F1 : Libalm formula with 5% papaya juice concentration
F2 : Libalm formula with 7.5% papaya juice concentration
F3 : Libalm formula with 10% papaya juice concentration

Based on graph 2. the results of the lipbalm melting point test ranged from 55oC-58oC. This shows that the melting point of this lipbalm preparation has met the requirements by taking into account the resistance factor to the surrounding weather temperature, especially the temperature in the tropics, which is in the range of 50oC-70oC [11].

SPF Value Determination Results



Graph 3.SPF Value Results
Source: Data Processed, 2021

Description :
F0 : Lipbalm formula without papaya juice (negative control)
F1 : Libalm formula with 5% papaya juice concentration
F2 : Libalm formula with 7.5% papaya juice concentration
F3 : Libalm formula with 10% papaya juice concentration

Based on graph 3. The SPF value results show that Formula 0 (without papaya juice) produces an SPF value of 3,528. Then in Formula 1 with a concentration of 5% it produces an SPF value of 5.912, in Formula 2 with a concentration of 7.5% it produces an SPF value of 7,841 and in Formula 3 with a concentration of 10% it produces an SPF value of 12,591.

DISCUSSION

The research on the formulation of lipbalm from papaya (Carica papaya L.) pulp as a sunscreen was carried out at the Pharmaceutical Technology Laboratory, Bina Mandiri University, Gorontalo. The sample used in this study was papaya pulp.

The papaya fruit used by researchers is a type of California papaya obtained from plantations in the Bone Bolango Regency, precisely in Tapa District, Meranti Village. Before taking papaya fruit samples, the researchers first made a determination on the papaya fruit plant. Determination of this plant is done to avoid mistakes and also to ensure the correct identity of the plants that will be used by researchers. Based on the results of the determination, the California papaya tree is shorter than other types of papaya, at least 2 meters high. The leaves are many-fingered and have a bud on the surface of the base. The fruit has a thick skin and a flat surface, the flesh is chewy, thick, and sweet in taste. Its weight ranges from 600 g to 2 kg [7].

In this study using 3 formulas with different concentrations. F1 with a concentration of 5% requires 50 ml of

papaya juice, F2 with a concentration of 7.5% requires 75 ml of papaya juice and F3 with a concentration of 10% requires 100 ml of papaya juice, so all of the three formulas require papaya juice. as much as 225 ml. 225 ml obtained from 500 grams of papaya fruit. The reason for choosing papaya fruit is because it has high antioxidant activity compared to ripe papaya [8].

Processing of papaya fruit is the initial stage carried out in this study, where the papaya fruit is first washed with running water. The purpose of washing the fruit is so that the fruit used is clean of impurities. Then the papaya fruit is peeled after that it is washed again to remove the sap from the papaya fruit. Then the peeled papaya fruit is mashed using a grater to make it easier for the papaya fruit to be blended. After that the papaya fruit is mashed again using a blender, then the papaya fruit that has been smooth is filtered using a filter cloth. The purpose of filtering is to separate the juice from the residue.

The next step is phytochemical screening. Phytochemical screening was carried out to find out what compounds were contained in papaya juice. Based on the results of the phytochemical screening carried out, there are several compounds contained in papaya juice, namely flavonoid compounds that use NaOH reagent which is characterized by the formation of a yellow color change in the sample. Then the presence of saponin compounds using HCl reagent which is characterized by the formation of foam on the test sample. Furthermore, the tannin compound using FeCl3 reagent did not form a green color. This is in line with research that has been done, which states that the ethanolic extract of papaya fruit does not contain tannin compounds [28].

Empirically papaya fruit can be used to treat skin rashes or skin burned by excessive sunlight. Papaya fruit contains phenolic compounds belonging to the flavonoid group which are thought to be active ingredients in sunscreens so that they can prevent the harmful effects of UV rays and can also prevent damage to the skin [30].

Flavonoids are secondary compounds that are widely found in plants, including papaya fruit plants. Flavonoids have potential as sunscreens due to the presence of chromophore groups (conjugated single double bonds) that are able to absorb UV rays, both UVA and UVB which can reduce the intensity on the skin [14].

Next is the manufacture of lipbalm preparations. Lipbalm is a preparation that is used on the lips to prevent drying and protect the lips from adverse environmental factors [12].

After that, the finished lipbalm was tested for physical stability with test parameters consisting of organoleptic tests, pH tests, homogeneous tests and melting point tests. The purpose of this physical stability test is the ability of a product to maintain its properties and characteristics to be the same at the time of manufacture.

Organoleptic test was carried out by observing the physical appearance of the lipbalm preparation including smell, color and shape. The results of observations made for 28 days that the F0 preparation did not change color, had a characteristic odor of the base and had a good shape that did not melt at room temperature storage and there was no separation in the preparation. Preparations F1, F2 and F3 also did not change color, had a characteristic smell of juice, had a good shape that did not melt at room temperature storage and did not separate in the lipbalm preparations that were made.

Furthermore, the results of the pH test, this test was carried out to determine the level of acidity in each lipbalm preparation so that the preparation made was safe and did not cause irritation to the

skin, especially on the skin of the lips. In F0 without papaya juice and F1 the pH ranges from 1-2 where the pH of the F0 and F1 preparations does not meet the requirements, this happens because at F0 no papaya juice has been added so that the acidic cacao oleum base can cause the pH of the preparation to drop. This happens because of the physicochemical properties of cocoa oleum which states the pH of cacao oleum is 1-4. Meanwhile, in F2 and F3 with a concentration of 7.5% and 10%, the pH ranged from 5-6. Because the higher the concentration of papaya juice, the higher the pH value. Papaya has a higher pH value of 4, 94 so that the more papaya juice is added, the higher the pH value of the papaya juice. This indicates that the pH of this lipbalm preparation is in the lip pH range, which is 4.5-8 [24]. In the pH test, the value ofsignificance of $P < 0.05$ so it can be concluded that there is a significant difference in pH in each lipbalm formula.

Furthermore, homogeneity test, this test is carried out aiming to see whether the preparation is made homogeneous or not which is characterized by the presence of coarse grains. The lipbalm preparations F0, F1, F2, and F3 produced a homogeneous preparation where there were no coarse grains in the papaya pulp lipbalm preparation. Because when the lipbalm preparation is applied to the slide, there are no coarse grains on the preparation. This is in line with research that has been carried out where in the study the lipbalm preparation made did not contain coarse grains when applied to the slide [31].

Next, test the melting point. At F0 produces a melting point of 580 C, while at F1 57.30 C, F2 56.20 C and F3 55.10 C. The difference in melting temperature is due to differences in the concentration of each lipbalm preparation made. Where the higher the concentration of papaya juice used in lipbalm preparations, the lower the melting temperature of the preparation. This happens because of the decreasing base used in each preparation and will affect the consistency of the lipbalm preparation that is made. This is in line with research that has been carried out stating that the reduced base used will have an effect on the preparations made [13].

The melting point test resulted in a significance value of $P < 0.05$, so it can be concluded that there is a significant difference in melting point for each lipbalm formula made.

After completing the physical stability test, it was continued with the determination of the SPF value on the lipbalm preparation. From the results obtained, each preparation produces a different SPF value. F0 (without papaya juice) produces an SPF value of 3,528, so based on these results the lipbalm base has activity as a sunscreen by providing very low protection. While F1 with a concentration of 5% produces an SPF value of 5.912, based on these results F1 has activity as a sunscreen by providing low protection. Furthermore, F2 with a concentration of 7.5% produces an SPF value of 7.841 then based on these results F2 has activity as a sunscreen by providing low protection. Then at F3 with a concentration of 10% it produces an SPF value of 12, 591 then based on these results F3 has activity as a sunscreen by providing low protection. Based on these results, it is known that increasing the concentration of papaya juice can increase the SPF value in each preparation. The increase in SPF value in lipbalm preparations is because papaya juice contains phenolic compounds of the flavonoid group. Based on the results of research that has been carried out, it is stated that phenolic compounds from the flavonoid group play an active role as sunscreen ingredients [30].

Furthermore, this study was tested statistically using SPSS 16.0 with the One Way Anova method to determine normality and homogeneity.

The data generated in this test is stated that the data is not normally distributed. Since the data were not normally distributed, the test was continued with the Kruskal Wallis method to determine the average difference between groups. Based on the above test, the four formulas have a significant effect on sunscreen preparations.In this case, H0 is rejected and H1 is accepted. This means that the juice from papaya can be used as a sunscreen preparation with the difference in the concentration of fruit juice in each formula.

CONCLUSION

Based on the results obtained, it can be concluded that:

1. Papaya pulp can be formulated into lipbalm preparations
2. Lipbalm formulations with concentrations of 5%, 7.5% and 10% can affect the physical stability of the preparation
3. Papaya pulp extract with concentrations of 5%, 7.5% and 10% is efficacious as a sunscreen by producing an SPF value at F1 which is 5,912 provides low protection, F2 produces an SPF value of 7,841 provides low protection and F3 produces an SPF value of 12,591 provides low protection. While at F0 without papaya juice, it produces an SPF value of 3,528 which provides very low protection.

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