

Physical Stability Test of Ethanol Extract Ointment Preparation of Ambon Banana Peel (*Musa acuminata cavendish* *subgroup*)

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ABSTRACT

Medical plants found in nature, one of which is the banana plant. Bananas have many benefits but have not been widely used by the public. contains tannins, saponins and flavonoids found in banana hump reported to contain vitamin C, vitamin A, protein and fat which work in the process of wound healing. Ointments are the most suitable preparation for the treatment of burns because they function as carriers of medicinal substances for use on the skin, as lubricants and skin protectors so as to prevent contact of the injured skin surface with external stimuli. Ointment is a semi-solid preparation that is easily applied and used as an external medicine.

This study aims to look at the physical stability of the formulation of sakep preparation of ethanol extract of ambon banana peel at concentrations of 10%, 15%, 20%. Evaluation of physical properties includes organoleptic tests, homogeneity, pH, spreadability and adhesion. The test results showed that the best formulation was formulation 3, namely the kapok banana peel extract ointment with a concentration of 20% which met the requirements for pH testing, spreadability test and adhesion ability.

Keywords : Extract, Formulation, Ointment.

INTRODUCTION

Plants with medicinal properties found in nature, one of which is the banana plant. Bananas have many benefits but are not widely used by the public. Banana peels can relieve pain in burns, overcome itching on the skin, treat the skin, speed up the healing of wounds that are already starting to dry, and fertilize the soil (as fertilizer), apart from containing tannins, saponins and flavonoids found in banana tubers which are reported to contain vitamins. C, vitamin A, protein and fat which work in the wound healing process. Ointment is the most suitable preparation for treating burns because it functions as a carrier for medicinal substances for use on the skin, as a lubricant and skin protector, thus preventing contact of the injured skin surface with external stimuli. Ointment is a semi-solid preparation that is easy to apply and use as an external medicine.

The extract ointment preparation in this study was tested with a positive control as a comparison, namely Gentamicin Ointment. Gentamicin is an aminoglycoside antibiotic that is effective for inhibits bacteria that cause primary and secondary skin infections such as *Staphylococcus aureus*. In this research, an ointment preparation will be made using ethanol extract of kapok banana peel using varying extract concentrations, namely 10%, 15% and 20%, which will then be tested for physical quality readers who are not experts on the subject. Use a narrative format and avoid sub-chapters.

METHODS

Tools and materials

The equipment used in this study were analytical scales, sieves, stirring rods, measuring cups, filter paper, aluminum foil, ovens, hot plates, beakers, mortars, pestles, pH meters, glass plates, petri dishes, droppers, ointment containers. The materials used in the study were 8500 grams of goroho banana peel, 96% ethanol, stearic acid, cetyl alcohol, glycerin, Triethanolamine (TEA), liquid paraffin, methyl paraben, distilled water.

Sample Preparation

Ambon banana peel was used as much as 8500 grams which was then washed with running water, chopped, and dried indoors. The sample was then blended and sieved to become *simplicia* (Edy et al, 2019).

Extract Preparation

Ambon banana peel was extracted using the maceration method with 96% ethanol solvent. The maceration process was carried out for 5 days until filtrate 1 and dregs 1 were obtained. Dregs 1 were then re-macerated for 3 days until filtrate 2 and dregs 2 were obtained. Filtrate 1 and filtrate 2 were mixed and evaporated using an oven until a thick extract was obtained (Edy et al, 2019).

Evaluation of Physical Properties of Ointment

- **Organoleptic Test** Organoleptic test examination includes odor, color, and texture. Testing was carried out with replication on each formula three times (Directorate General of POM, 1979).
- **Homogeneity Test** A total of 1 gram of ointment was applied to a piece of transparent glass. Then the preparation was observed to show a homogeneous composition and no coarse grains were seen (Ida and Noer, 2012). Testing was carried out with replication three times for each formula.
- **pH Test** The pH test aims to determine the safety of the ointment preparation when used so that it does not irritate the skin. Weighed as much as 1 gram of ointment extract and diluted with 10 ml of distilled water. The pH of a good preparation is in accordance with the pH of the skin, which is 4.5 - 6.5 (Tranggono and Latifa, 2007; Parwanto et al, 2013; Edy et al, 2016). Testing is carried out with three replications for each formula.
- **Spreading Power Test** Weigh 0.5 grams of ointment, then place it in the middle of a petri dish in an inverted position, leave it for 1 minute and give a load of 50 grams to 250 grams every 1 minute 5. The standard spreadability of the ointment is 5 cm - 7 cm (Ulaen et al, 2012; Parwanto et al, 2013; Edy et al, 2016). Testing is carried out with three replications for each formula.
- **Adhesion Power Test** Weigh 0.5 grams of ointment applied to a glass plate and given a load of 250 grams for 5 minutes. The load is lifted and the two attached glass plates are removed while the time is recorded until the two plates are released from each other. The standard for good ointment adhesion is >4 seconds (Ulaen et al, 2012; Parwanto et al, 2013; Edy et al, 2016). Testing was carried out with three replications for each formula.
- **Stability Test** The stability test was carried out using the cycling test method. The ointment was stored at a temperature of $\pm 40^{\circ}\text{C}$ for 24 hours and then at a temperature of $\pm 40^{\circ}\text{C}$ for 24 hours. Testing was carried out for 6 cycles, where each cycle observed physical changes in the ointment including organoleptic, homogeneity, pH, spreadability and adhesion (Suryani et al, 2017).

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RESULTS

Ambon Banana Peel Extraction

Ambon banana peel simpisia was extracted by maceration method using 96% ethanol solvent and evaporated using oven to produce 45.8 grams of thick extract. The yield percentage was 6.27% b/v.

Table 1. Formulation of Ambon banana peel extract ointment

Material Name	Function of Materials	Control	Concentration (%)		
			F1	F2	F3
Banana Peel Extract	Active Ingredients	-	10	15	20
Cera Alba	Stabilizing agent	5	5	5	5
Lanolin	Ointment Base	3	3	3	3
Propyl Paraben	Preservative	0,01	0,01	0,01	0,01
Cetil Alkohol	Hardening agent	1	1	1	1
Vaselin Album	Ointment Base	90,99	80,99	75,99	70,99

Physical Properties Evaluation of Ointment

a. Organoleptic Organoleptic tests include the odor, color and texture of the Goroho banana peel extract ointment which are observed visually. The results of the organoleptic test of the ointment can be seen in table 2.

Table 2. Organoleptic Test Results

Formula	Organoleptic Test Assessment Parameters		
	Shape	Colour	Smell
Control	Semi Solid	White	typical
Formula 1	Semi Solid	Light brown	typical
Formula 2	Semi Solid	Brown	typical
Formula 3	Semi Solid	Dark brown	typical
Control +	Semi Solid	White	typical

a. Homogeneity

The homogeneity test of the ointment aims to see whether all components of the ointment are mixed well or not. The results of the homogeneity test of the ointment can be seen in table 3.

Table 3. Homogeneity test

Formula	The results obtained
Control -	Semi solid
Formula 1	Semi solid
Formula 2	Semi solid
Formula 3	Semi solid
Control +	Semi solid

b. pH

The pH test aims to determine the acidity level of the preparation to match the pH of the topical preparation. The results of the pH test of the ointment can be seen in table 4.

Table 4. pH Test Results

Formula	Average	Range
Kontrol -	6,21	

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Formulasi 1	6,12	
Formulasi 2	6,40	4,5 – 6,5
Formulasi 3	6,32	
Kontrol +	5,82	

The results of the pH test showed that all formula preparations met the requirements during the process. Pengujian

c. Spreadability

The spreadability test aims to determine the ability of the ointment to be easily applied or used. The results of the spreadability test can be seen in table 5.

Table 5. Spreadability Test Results

Formula	Average (cm)	Range
Kontrol -	4,1	
Formula 1	7,1	5 – 7 cm
Formula 2	7,91	
Formula 3	5,8	
Kontrol +	5	

DISCUSSION

The spreadability test aims to determine the ability of an ointment preparation to spread on the skin. This will affect whether an ointment preparation has been optimally absorbed or not. The spreadability of the ointment is said to be good if its diameter is around 5-7 cm. Measurement of the diameter of the spreadability of the ointment is carried out when the ointment has been added with a load of 150 grams. The diameter of the spreadability of the ointment formula 3 and the positive control showed results that met the requirements.

a. Adhesion

The spreading power test aims to determine how long the ointment can stick. The results of the ointment adhesion test can be seen in table 6.

Table 6. Adhesion Power Test Results

Formula	Rata Rata (detik)	Range
Kontrol -	03,10	
Formula 1	03,42	
Formula 2	03,80	Tidak kurang dari 4 detik
Formula 3	05,10	
Kontrol +	07,13	

longer the adhesive time of the ointment, the better because it allows the active substance to be completely absorbed. The standard adhesive power of the ointment is not less than 4 seconds (Ulaen et al, 2012). The results of the adhesive power test, the formula that meets the requirements for good adhesive power is formulation 3 and the positive control.

b. Stability The results of organoleptic tests during the cycling test can be seen in table 7. Table 7.

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Organoleptic Test Results During the Cycling Test			
Formula	Smell	Colour	Tekstur
Kontrol -	Tidak ada	What	Semi solid
Formulasi 1	Banana fruit ethanol specialties	Yellow	Semi solid
Formulasi 2	Khas Banana fruit ethanol specialties buah pisang	Yellow	Semi solid
Formulasi 3	Khas Banana fruit ethanol specialties buah pisang	Yellow	Semi solid

CONCLUSION

Organoleptic testing before cycling test (cycle 0) and during cycling test (cycle 1-6) did not experience any changes in color, odor and shape of the preparation. So this ointment meets the stability test standards.

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