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THE EFFECT OF THE COMPARISON FROM CONCENTRATION OF KELULUT HONEY *(HETEROTRIGONA ITAMA)* AND ADEPS LANAE TO THE PHYSICAL STABILITY OF OINTMENT

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ABSTRACT
Kelulut honey is a natural ingredient that has many benefits and relatively safe. One of the benefits is its regeneration process so it's useful in healing wounds. The result of research on the inhibition of 5% honey in DMSO shows that it can inhibit Staphylococcus Aureus and Pseudomonas Aeruginosae bacteria. The Ointment is a semisolid medicine that is soft, easy to apply, and is used as an external medicine on skin and mucous membranes. This study aims to find out how the physical stability of adeps lanae-based ointment combined with the active ingredient of kelulut honey (*Heterotrigona Itama*) and to determine the concentration of adeps lanae base which provides the best physical stability of honey ointment (*Heterotrigona Itama*). The ointment of kelulut honey was formulated using adeps lanae-based made with three variations in the ratio of active substances, namely F1 50%, F2 60%, and F3 70%, and tested for the stability of physical properties including organoleptic test and homogeneity, spread power test, sticky power test, and the protection power test was then analyzed statistically using *SPSS*. The ANOVA test results on dispersion and adhesion of ointment showed that there were no significant differences between F1, F2, F3 seen from sig ($p > 0.05$), and based on the results of the posthoc test the most stable formula was at 70% concentration ointment. The test results on physical stability indicate that all formulas have good physical stability and are able to provide protection against the skin.

KEYWORDS: Ointment, *Heterotrigona Itama*, Adeps Lanae, Physical Stability.

INTRODUCTION
Kelulut honey (Heterotrigona Itama) is a natural ingredient that has various benefits both in health, beauty and others. One of the benefits of honey is it can help speed up the process of wound healing. Honey is believed to have efficacy in accelerating wound healing processes such as anti-inflammatory activity, antibacterial activity, antioxidant activity, the ability to stimulate the process of removing dead tissue, reducing odor in the wound and maintaining wound moisture.[1][2] The excellent inhibition of the growth of six species of bacteria including Staphylococcus aureus has been proven in Heterotrigona Itama honey from Australia.[3] The results of research on the inhibition of honey 5% in DMSO can inhibit Staphylococcus Aureus and Pseudomonas Aeruginosae bacteria. The higher the level of honey the greater the inhibition of the bacteria.[4]

Ointment is a semisolid medicine that is soft, easy to apply, and is used as an external medicine on the skin and mucous membranes.[5] The formulation of an occlusive ointment contains a fatty base with water emulsifier in oil or oil in water[6], while percutaneous drug absorption per unit of skin surface area increases proportionally with increasing drug concentration in a carrier.[7] The ointment base used in this study was adeps lanae. Adeps lanae is one component of cold cream which functions to increase the absorbency of water, so it is estimated that it affects the release of salicylic acid which is difficult to dissolve in water.[8] A good preparation of ointment must meet the requirements for physical properties and be stable during storage.

The importance of physical stability tests to see the survival capacity of preparations within the limits set throughout the storage period and not experience changes in the nature and characteristics of the storage period of the preparation or the same as when the preparation was made.[8] The honey-coated ointment orientation was carried out again but using the adeps lanae base considering the damage to the ointment that occurred when using a base of vaselin flavum. The concentration of honey used at the orientation of the honey honey ointment is a concentration of 20%, 40%, 50%, 60%, to the highest concentration of 70%. The

orientation results indicate that the ointment is stable, not broken or damaged after 2 weeks of storage.

MATERIALS AND METHODS

Tools

Glassware, analytical scales, baths, high resolution cameras.

Materials

Kelulut honey **(***Heterotrigona Itama)*, propyl paraben (Clorogreen®), methyl paraben (Clorogreen®), dimethyloldimethyl hydantoin (Clorogreen®), and adeps lanae (PT. Brataco, J0836 / 15). All materials used are pharmaceutical quality.

Ways of working

1. Making Ointment Preparation

No	Materials	Formula 1	Formula 2	Formula 3
1	Kelulut honey (gr)	20	24	28
2	Methyl paraben (gr)	0,008	0,008	0,008
3	Propyl paraben (gr)	0,072	0,072	0,072
4	Dimethyl hydantoin (gr)	0,4	0,4	0,4
5	Adeps Lanae (gr)	19,52	15,52	11,52
Total Stock Weight (gr)		40		

Information: F1: Kelulut Honey Ointment concentration 50%
F2: Kelulut Honey Ointment concentration 60%
F3: Kelulut Honey Ointment concentration 70%

Making an ointment with a honey-coated active ingredient begins with weighing the ingredients used. The initial step is that adeps lanae is melted at a temperature of 70 ℃. After the adeps lanae melting is put into the mortar it's crushed slowly until it is homogeneous. After adeps lanae turns yellowish white, add honey to the mouth little by little while remaining crushed. Add DMDM hidantoin while remaining crushed. Then added a solution of methyl and propyl paraben, scour again until homogeneous. Prepared ingredients, put into pots of ointment. The ointment was then made as many as 3 replications, with the aim to see the repetition of the making of ointment (reproducibility) whether or not there was a change in physical stability or not.

2. Evaluation of the Physical Stability of Ointment

Evaluation of physical stability carried out was organoleptic test and homogeneity test, spreadability test, sticky power test and protection power test.[9] Examination of physical evaluation is carried out on days 0, 3, 7, 14, 21, and day 28.[10]

3. RESULTS OF ANALYSIS

Data analysis results of testing the physical properties of ointment (organoleptic, adhesion, dispersion, and protection power test) were tested for homogeneity and Kolmogorov-smirnov test. If the data is normally distributed in the Kolmogorovsmirnov test ($\alpha \geq 0,05$) and homogeneous in the homogeneity test ($\alpha \geq 0,05$), then one way ANOVA parametric test and post hock test are performed. If it is not in accordance with these provisions, then the non parametric test Kruskal-Wallis and Mann Whitney are continued. The data were significantly different if the parametric test or the non parametric test $\alpha \geq 0.05$.

RESULTS AND DISCUSSION

1. Evaluation of the Physical Stability of Ointment

a. Organoleptic and Homogenity

Organoleptic testing obtained a yellow ointment rather thick with a distinctive smell of honey. The ointment should have an attractive color, a pleasant smell with a soft texture on the skin because it will affect the user's comfort. The results of examination of the homogeneity of the formula for ointment have good homogeneity and stable color. This shows that the difference in concentration of the three formulas with honey active ingredients 50%, 60% and 70% did not affect the homogeneity of the ointment.

b. Spread Power Test

Figure 1. Spread Power Test

Based on the results of the dispersion test, it appears that the ointment has a spread that is increasing on the 28th day. Changes in the distribution of preparations can be affected by changes in the consistency of the preparation. The lower the consistency of the ointment, the higher the spread of the ointment will make it easier for the ointment to be used on the skin. The concentration of the active substance also influences the spread of ointment, namely the higher the concentration of honey in the preparation, the lower the consistency of the ointment so that the spread is higher.[11],[12]

c. Sticky Power Test

Figure 2. Sticky Power Test

Strength Test The ointment is performed to determine the ability of the ointment to stick to the skin when used. The results of observations show that the adhesion of each ointment stored for 4 weeks after manufacture has a tendency to increase the sticky power time during storage. Generally the sticky power is directly proportional to the consistency, the more the composition of the liquid in the formula, the more ointment has a lower consistency. This is influenced by

the presence of honey in the preparation, where the honey used has a liquid consistency. However, the testing of the sticky strength of the ointment was done, the higher the consistency but the more sticky power it was. This can happen because the ingredients in the ointment composition are made. From the experiment, the results showed that the adhesion test of the ointment was good because it fulfilled the good adhesion requirements where the adhesion of the ointment was good according to the literature, which is more than 4 seconds.[13]

d. Protection Power Test

Power Testing Ointment protection is carried out to determine the ability of the ointment to protect the skin from outside influences such as acids, bases, dust, pollution and sunlight. From the experiment, the results showed that the preparations for the protection test against KOH 0.1 N were able to provide protection or protection against the skin (0.1 N KOH liquid on filter paper for 5 minutes) this was evidenced by the absence of red stains on filtered paper with 0.1 N KOH liquid so that the ointment meets topical protection quality standards.

2. Results of Data Analysis of Ointment Preparation

a. Spread Power Test

Formula data analysis results were taken formula data on the 28th day because the 28th day was the last day of testing, where the preparation had undergone many changes, the analysis showed that the data met the normality and homogeneity test so the data was parametric and continued with One Way ANOVA The results of the analysis showed (p> 0.05) which means there was no significant difference in the spread of ointment. Data analysis on days 0, 3, 7, 14, 21, 28 F1 50% formula, F2 60%, and F3 70% normality and homogeneity test showed that the data were non parametric and followed by the Mann-Whitney test. Based on the results of the Mann-Whitney test, the treatment groups that did not differ in meaning from day 0 to day 28 were only F1 50%, while F2 60% and F3 70% differed significantly.

b. Sticky Power Test

Parametric comparison test, One Way ANOVA followed by LSD test on sticky power data. The results of the formula data analysis were taken formula data on the 28th day. Based on the results of the One Way ANOVA test there were no significant differences between formulas (F1, F2, and F3) seen from the sig value (p> 0.05), meaning that the sticking power between formulas was approximately the same. To see which formula has the most stable adhesion, a comparison of the 0, 3, 7, 14, 21 and 28 sticky days for each formula (F1, F2, and F3) is compared. Based on the results of the One Way ANOVA test followed by the Post Hoc Test it can be concluded that F3 (70% honey concentration) is the most stable formula, because F3 70% has the least sign of significance compared to F1 50% and F2 60%. This proves that the high concentration of honey in the preparation can maintain the stability of the ointment.

ATTACHMENT

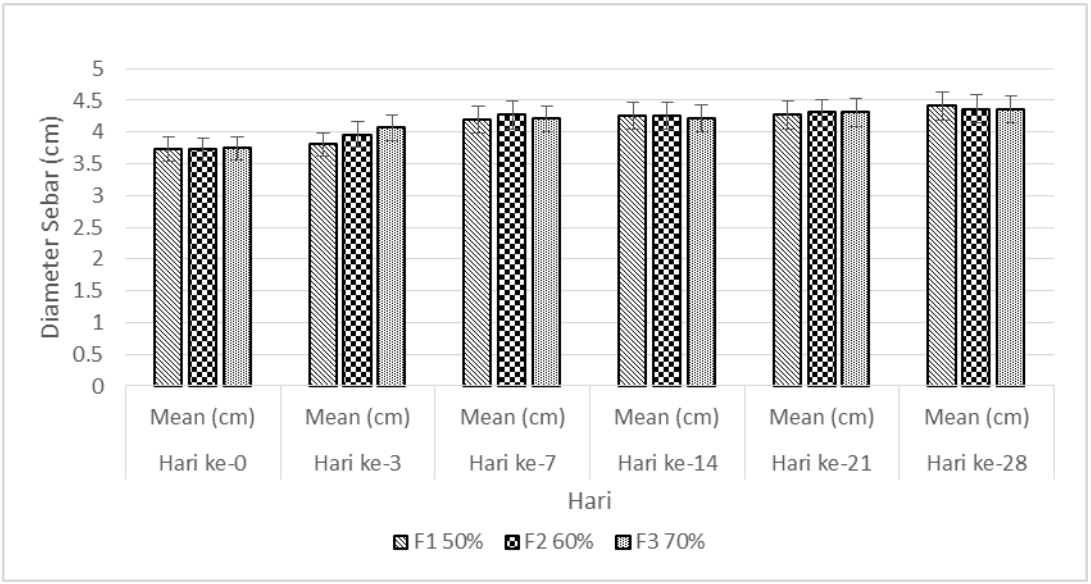

Figure 1: Spread Power Test.

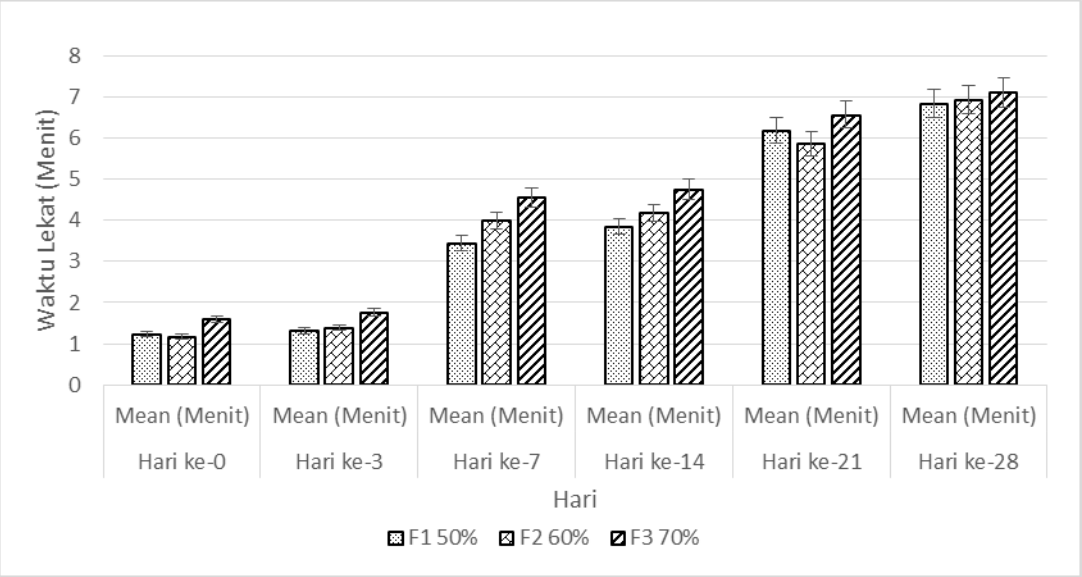

Figure 2: Sticky Power Test.

CONCLUSION

Based on the results of the research that has been done, it can be concluded as follows :

1. The adeps lanae based ointment combined with the active ingredient of honey honey (Heterotrigona Itama) has the stability of physical properties that meet the requirements and can provide protection against the skin.
2. The concentration of the adeps lanae base that provides the most stable physical properties of honey ointment (Heterotrigona itama) is the 70% F3 formula because it satisfies the requirements of good dispersion and has the most stable adhesion. SPSS ointment with a concentration of 70% is not much different than the 50% and 60% concentration ointment.

SUGGESTION

The suggestion from this study is that an irritation test for the preparation of honey honey ointment (Heterotrigona itama) is needed to determine the safety of the preparation if applied to the skin.

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