



THE EFFECT OF THE COMPARISON FROM CONCENTRATION OF KELULUT HONEY (*HETEROTRIGONA ITAMA*) AND WATER PHASE OF SNAKEHEAD FISH EXTRACT (*CHANNA STRIATA*) TO THE PHYSICAL STABILITY OF OINTMENT

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ABSTRACT

Ointment is a semisolid medicine for external or topical use and easily to applied. The water phase of snakehead fish extract contains albumin which is effective to speed up the healing process. Empirically honey is one of the natural ingredients that has many benefits and relatively safe, one of the benefits is its regeneration process so it's useful in healing wounds. Adeps lanae is the basis of ointment that function is to increase the water absorbency and contain not more from 0.25% water. This study aims to find out the formulation of Kelulut honey (*Heterotrigona itama*) combination ointment and water phase of snakehead fish extract (*Channa striata*) for 28 days of physical stability test. Varieties of kelulut honey: the water phase of snakehead fish extract used is 25: 75%, 50: 50% and 75: 25% and tested for the physical stability which include organoleptic test and homogeneity, dispersion test, adhesion test, and protection power test, and then statistically analyzed using SPSS. The ANOVA test results on dispersion of ointment showed that there were no significant differences between F1, F2, F3, F4, F5 and F6 seen from sig ($p > 0.05$), and the most stable formula in the ointment based on the results of the posthoc test was formula 2 for 40% concentration, and the most stable formula for adhesion test is formula 2 for 40% concentration. 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*, Snakehead Fish, Adeps Lanae, Physical Stability.

INTRODUCTION

Pharmaceutical technology has now started to develop rapidly so that with these developments the pharmaceutical industry will be easier to produce drugs of good quality, especially in drug stability. The stability of the drug is important to note because it will have an impact on the effectiveness, safety and quality of the drug.^[1] One pharmaceutical preparation that is easy to use is ointment. Ointment is chosen because it is the most suitable pharmaceutical preparation for the purpose of treatment on the skin due to longer contact between the drug and the skin. The ointment is easily applied and used as an external medicine.^[2]

Wounds are physical injuries that cause tearing and damage to skin tissue. Healing is the body's natural process in regenerating damage to skin and epidermal tissue but the rate of healing is very slow and allows for microbial infection.^[3] One of the wound medicines that is usually used by Indonesian people in the form of medicines from natural ingredients, both vegetable and animal, is Snakehead Fish (*Channa striata*). Research has revealed the fact that Snakehead Fish has a protein

content with most albumin. Albumin is used to accelerate recovery of damaged body cells or tissues.^[4] In a study conducted by Kurniawati in 2014, the administration of pure Snakehead Fish albumin extract with freeze dryer technology for 3 days can increase albumin levels by 1.26 ± 0.30 mg / dl.^[5] Albumin drying can use the cold drying method, because it does not damage the ingredients or compounds and maintain the quality and safety.^[6]

Other natural ingredients that can be used to treat wounds and have antibacterial activity are honey kelulut (*Heterotrigona itama*). Kelul honey (*Heterotrigona itama*) has been shown to have a inhibitory effect on the growth of six species of bacteria including *Staphylococcus aureus* from Australia.^[7] The results of the 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.^[8]

Another study on the test of the effect of wound healing of molten honey ointment (*Heterotrigona itama*) on

wistar male white rats using non-debridement dressing method based on vaselin flavum ointment and adeps lanae emulgator showed that ointment with honey concentration of 20% and 40% could heal wounds in mice white male wistar, and this study also showed that the ointment was broken / damaged after a week of storage.^[9] The orientation of the honey ointment and the phase of Snakehead Fish extract was carried out using the adeps lanae base, considering the damage to the ointment that occurred when using a base of vaselin flavum. The concentration used at the orientation of honey ointment is the mouth and water phase of Snakehead Fish extract, which are concentrations of 40% and 50%. The orientation results indicate that the ointment is stable, not broken or damaged after 2 weeks of storage. Based on the description above, the researcher was interested in conducting research on the formulation of the preparations of the honey honey ointment (*Heterotrigona itama*) and the water phase of Snakehead Fish extract (*Channa striata*) with the base of absorbent ointment. The results of the ointment were then tested for physical stability including organoleptic, homogeneity, adhesion, spreadability and protection test.

MATERIALS AND METHOD

Tools

The tools used in this study were divided into several groups, including preparation equipment such as beaker

WAYS OF WORKING

1. Preparation of ointment preparations

Name of materials	F1	F2	F3
Honey : Water phase of Snakehead Fish extract (40%) (gr)	12:4	8:8	4:12
Propyl paraben (gr)	0,008	0,008	0,008
Metyl paraben (gr)	0,072	0,072	0,072
DMDM Hidantoin (gr)	0,4	0,4	0,4
Adeps Lanae (gr)	23,448	23,448	23,448

Name of materials	F4	F5	F6
Honey : Water phase of Snakehead Fish extract (50%) (gr)	15:5	10:10	5:15
Propyl paraben (gr)	0,008	0,008	0,008
Metyl paraben (gr)	0,072	0,072	0,072
DMDM Hidantoin (gr)	0,4	0,4	0,4
Adeps Lanae (gr)	19,517	19,517	19,517

Information: F1 = honey kelulut: water phase extract of Snakehead Fish (40%) (75:25)

F2 = honey kelulut: water phase extract of Snakehead Fish (40%) (50:50)

F3 = honey kelulut: water phase extract of Snakehead Fish (40%) (25:75)

F4 = honey kelulut: water phase extract of Snakehead Fish (50%) (75:25)

F5 = honey kelulut: water phase extract of Snakehead Fish (50%) (50:50)

F6 = honey kelulut: water phase extract of Snakehead Fish (50%) (75:25)

Preparation of ointments with phase active ingredients of Snakehead Fish extract and honey from kelulut begins with weighing the ingredients used. The initial step, Adeps lanae, is melted at a temperature of 70 °C. After melting Adeps lanae is put into the mortar and crushed slowly until homogeneous. After Adeps lanae turns yellowish white, add methyl and propyl paraben

gradually until homogeneous. Add honey active ingredient little by little until it is homogeneous. Add DMDM Hydantoin into the water phase of Snakehead Fish extract until homogeneous, enter the water phase of Snakehead Fish extract which has been dissolved with DMDM Hydantoin gradually into the mortar while being

Materials

The ingredients used are honey (*Heterotrigona itama*), Snakehead Fish (*Channa striata*), dmdm hidantoin (Sharon), methyl paraben (PT. Brataco, technical), propyl paraben (PT. Brataco, technical) and adeps lanae (PT . Brataco, J0836 / 15 /).

crushed until homogeneous. Preparations are made, put in a 100cc ointment pot.

2. Evaluation of the Physical Stability of Ointment

Evaluation of physical properties 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, homogeneity, dispersion, adhesion and protection 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, the Krustal-Wallis and Mann Whitney non-parametric tests are continued. Data is different then if in parametric test or in non parametric test $\alpha \geq 0.05$.

RESULTS AND DISCUSSION

1. Evaluation of the Physical Stability of Ointment

a. Organoleptic and Homogeneity

Organoleptic testing obtained all ointment formulas with yellowish-white color with odor for all formulas which are typical 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 40% and 50% did not affect the homogeneity of the ointment.

b. Spread Power Test

Based on the results of the spread test, it appears that the ointment has the greatest dispersion power on the 28th day. Changes in the spread of the preparation can be influenced by changes in the viscosity of the preparation. The lower the viscosity of the ointment, the higher the spread of ointment so that it will be 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 the active ingredient of honey in the preparation, the higher the viscosity of the ointment so that its spread is lower.^[11]

c. Sticky Power Test

Adherence to the ointment is done to determine the ability of the ointment to stick to the skin when used. The results of the observation show that the adhesion of ointment is directly proportional to the storage time of the ointment. This is influenced by the presence of honey in the preparation, where the honey used has a rather concentrated consistency so that the dosage adhesion will increase.^[11] From these experiments, the results showed that the adhesion test of the ointment was good because

it exceeded the time as a good adherence requirement where the adhesion of ointment was good according to the literature, which was more than 4 seconds.

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 experiments it was obtained the results that the preparation in the protection test against KOH 0.1 N was 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 filter paper dripped with 0.1 N KOH liquid so that the ointment meets topical protection quality standards.

2. Results of Data Analysis of Ointment Preparations

a. Spread Power Test

The results of the formula data analysis 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. Based on the results of the One Way ANOVA test there were no significant differences between formulas (F1, F2, F3, F4, F5 and F6) seen from the significance value ($P > 0.05$), meaning that the spread power between formulas was approximately the same.

To see which formula has the most optimal scattered power stability, it is necessary to compare the distribution of 0, 3, 7, 14, 21, and 28 days for each formula (F1, F2, F3, F4, F5 and F6). Based on the results of the One Way ANOVA test, followed by the Post Hoc Test, it can be concluded that F2 40% (50% kelulut honey concentration and 50% Snakehead Fish extract water phase) is the most optimal formula. This is because F2 40% has the least sign of significance compared to F1, F3, F4, F5 and F6. This proves that the concentration of honey in the kelulut and the phases of Snakehead Fish extract water that are as much in the preparation (50:50) can maintain the stability of the spread of ointment at a concentration of 40%.

b. Sticky Power Test

The results of the formula data analysis 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. Based on the results of the One Way ANOVA test there are significant differences between formulas (F1, F2, F3, F4, F5 and F6) seen from the significance value ($P < 0.05$) which means that the sticking power between formulas is not the same or there are differences in meanings in the power treatment group stick to the ointment.

To see which formula has the most optimal adhesion, it is necessary to compare the stickiness of 0, 3, 7, 14, 21, and 28 days for each formula (F1, F2, F3, F4, F5 and F6). Data analysis of all formulas for normality and

homogeneity test shows that the data is non parametric so that it cannot be continued with the One Way ANOVA test and Post Hoc Test but the Mann-Whitney test shows ($P < 0.05$) which means that there are differences in the meanings in the sticky treatment group ointment or in other words all formulas are unstable.

CONCLUSION

1. The formula for the preparation of honey ointment (Heterotrigona itama) and the water phase of Snakehead Fish extract (Channa striata) can meet the criteria for good physical properties.
2. The ANOVA test results show that there are no significant differences between F1, F2, F3, F4, F5 and F6 seen from sig ($p > 0.05$), and based on the results of the post hoc test the most stable formula on dispersion is the formula 2 concentration of 40% and in the sticky power the most stable formula is formula 2 concentration of 40%

SUGGESTION

1. It is necessary to do an irritation test for the preparation of the honeyed ointment (Heterotrigona itama) and the water phase of Snakehead Fish extract (Channa striata) to determine the safety of the preparation if applied to the skin
2. For further research, it should be added with PEG 4000 which can increase the consistency of the ointment preparation, so that it can improve the adhesion of the ointment.

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