Effect of Grouper Collagen and Cork Fish Albumin for Making Wound Ointment

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***Abstract*-** The wound healing component consists of albumin, collagen, omega 3 and omega 6. These components become active substances in ointments used for wound healing. Ointment is a semisolid preparation that is soft, easy to apply, and is used as an external medicine on the skin. The source of albumin is snakehead fish, a source of collagen is grouper skin, omega 3 from flaxseed oil, and omega 6 from black cumin oil. The aim of this study was to obtain the optimal collagen concentration in making the best ointment. This study used different collagen concentrations, namely 0.4%, 0.6%, and 0.8%. then analyzed physics (pH and viscosity), chemistry (protein, fat and water), organoleptic odan. The test results were then analyzed using the de garmo method to determine the best quality ointment. The best results then tested the amino acid profile and zinc levels. The results of this study were the tiger grouper skin collagen concentration of 0.8% was the optimal concentration to produce the best collagen ointment. including a pH value of 6.8, a viscosity value of 27909 cP, a protein content of 11.61, a fat content of 79.01, and a water content of 2.55.

***Index Terms*-** ointments, collagen, proximate, amino acids

I. INTRODUCTION

Grouper is a seawater fish that has high economic value and is one of the export commodities, especially to Singapore, Japan, Hong Kong, Taiwan, Malaysia and the United States. In Indonesia there are seven genera of grouper fish, namely Aethaloperca, Anyperodon, Cephalopholis, Chromileptes, Epinephelus, Plectropomus, and Variola. Of the seven genera, generally only the genus Chromileptes, Plectropomus, and Epinephelus are commercial, especially for the international market, such as humpback grouper, sunuk grouper (including genus Plectropomus), mud grouper and tiger grouper (including genus Epninephelus) (Affan, 2012) . Nearly about ¾ of the total fish weight is waste. Fish waste consists of bones, skin, fins, heads, scales and offal. Thus, fish waste is one of the biggest problems in the fish processing industry. Fish waste can pollute the environment both on land and in waters. In fact, fish waste still contains quite high protein. Therefore, the use of fish waste into a product will reduce environmental pollution (Atma, 2016). One of the products that can be made from fish waste is collagen.

Ointment is a semisolid preparation that is soft, easy to apply, and is used as an external medicine on the skin and mucous membranes. The release of medicinal substances from the ointment base is strongly influenced by physico-chemical factors both from the base and from the medicinal substance, solubility, viscosity, particle size, homogeneity and formulation (Hernani, *et al*., 2012).

The composition of the ointment consists of a medicinal or active substance and an ointment base or commonly known as the active ingredient carrier. Ointment has a function as a carrier for active substances to treat diseases of the skin, as a lubricant and skin protector (Parwanto, *et al*., 2013). The aim of this study was to obtain the optimal collagen concentration in making the best ointment. The research results are expected to provide information, especially for the health sector and fishery product processors, that fish skin waste can be used as collagen for addition in making ointments..

II. MATERIALS AND METHODS

2.1 Material

The research materials used consisted of raw materials and materials for the collagen-making process in the form of grouper skin and snakehead fish meat for making albumin. Other materials used are distilled water, dialysis membrane, acetic acid (CH3COOH), NaOH, label paper, tissue and blancu cloth. Meanwhile, the ingredients used to make the ointment are adeps lanae, vaseline flavum.

This research method is an experimental method. In this study, the objective of this research was to obtain the optimal concentration of collagen in tiger grouper to add to the collagen ointment in order to obtain the best ointment quality.

2.1.1 Preparation of Albumin Extract

The production of albumin extract begins with the preparation of raw materials, namely the snakehead fish is turned off, then weeded, filled, diced and washed. Next, the snakehead fish is weighed 250 grams, then put into a steamer with a temperature of 70oC. The snakehead fish meat is steamed for 30 minutes. After that it is filtered and the filtrate is taken. Snakehead fish extract is ready to use.

2.1.2 Making Collagen

The first time to make collagen is to prepare the skin of the grouper which has been removed from the scales. Then the skin of the grouper is cut 1 x 1 cm. Then the grouper skin was immersed in 0.1 M NaOH for 24 hours with a ratio of skin and solution of 1:10. After that the grouper skin is neutralized with distilled water. Then soaked in acetic acid with a ratio of 1:10 for 24 hours. Then filtered and taken the filtrate. After that, the precipitation was carried out with 0.9 M NaCl for 24 hours. Then centrifuged at 3500 rpm for 20 minutes. Then dialysis with 0.5 M acetic acid with a ratio of 1:10. After that it is inserted into the cellophane membrane. Then soaked in 0.1 M acetic acid solution for 6 hours. Then soaked in distilled water to neutral pH. After that the collagen is ready for use.

2.1.3 Making Collagen Ointment

Preparation of the ointment begins by adding BHT to the first mortar, then adding the oil phase of the snakehead fish extract and grinding it until the BHT dissolves. Add a little adeps lanae and mix until homogeneous. Then dissolve the methyl paraben and propyl paraben on propylenglycol in a beaker glass, then add the water phase of the snakehead fish extract, stirring until it is homogeneous. In the second mortar, the remaining adeps lanae is added, gradually adding the mixture of methyl paraben, propyl paraben, and the water phase of snakehead fish extract while stirring until homogeneous. Then mix the first and second mortar ingredients, added with vaseline flavum, crushed until homogeneous. The preparation is put into an ointment pot (Andrie and Sihombing, 2017). The addition of grouper skin collagen, flaxseed oil and black cumin oil was done when mixing the first and second mortars.

III. RESULT AND DISCUSSION

3.1 pH

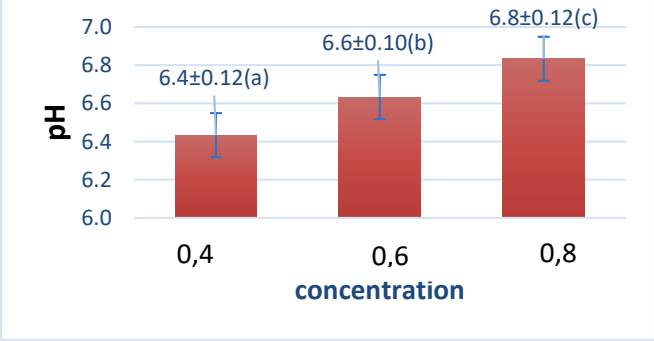

Figure 1. The Result of pH

The pH of collagen ointment with different collagen concentrations results in different pH values. At a collagen concentration of 0.4%, a pH of 6.4, a concentration of 0.6% was 6.6 and a concentration of 0.8% was 6.8. The pH of the collagen ointment showed

an increase with the difference in collagen concentration. The pH of the collagen ointment is as expected, that is, the pH is within the normal pH range of the skin, which is between 4.5 - 7, so it doesn't cause irritation or scaly skin. (Patimasari *et al*., 2015).

3.2 Viscosity

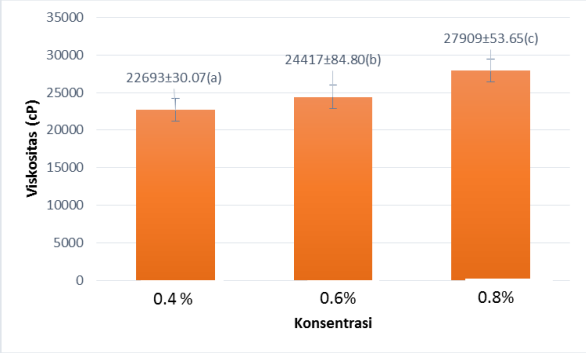

Figure 2. The Result of Viscosity

he viscosity value at the collagen concentration of 0.4% was 22693 cP, a concentration of 0.6% obtained a viscosity value of 24417 cP, and at a concentration of 0.8% was 27909 cP. The result of the viscosity of the ointment which has the highest value is the collagen concentration of 0.8% of 27909 cP, and the lowest yield is at a concentration of 0.4% of 22693 cP. The viscosity range for a good ointment is 2000-4000 cP. (Husnani and Muazham, 2017).

3.3 Organoleptic

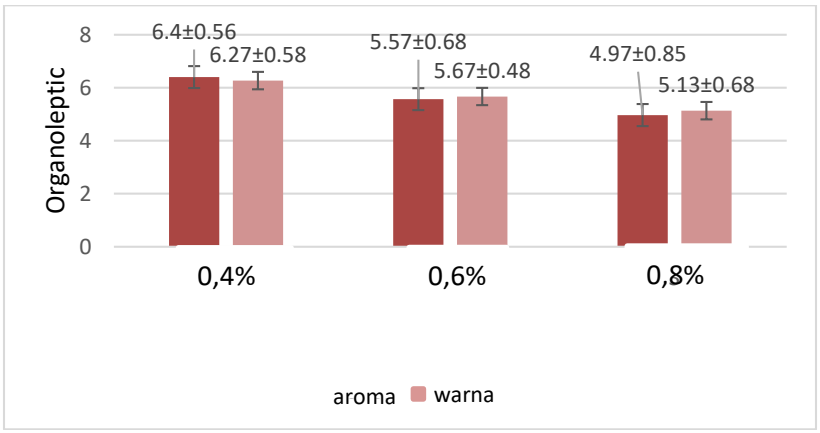

Figure 3. The Result of Organoleptic

There are differences in the results of the organoleptic test along with differences in collagen concentrations. The organoleptic value of color in the treatment with a concentration of 0.4% was 6.27, a concentration of 0.6% was 5.67 and a concentration of 0.8% was 5.13. While the treatment of different collagen concentration concentrations in the aroma parameter, the concentration of 0.4% is 6.4, the concentration of 0.6% is 5.57 and at a concentration of 0.8% shows a value of 4.97.

3.4 Protein Content

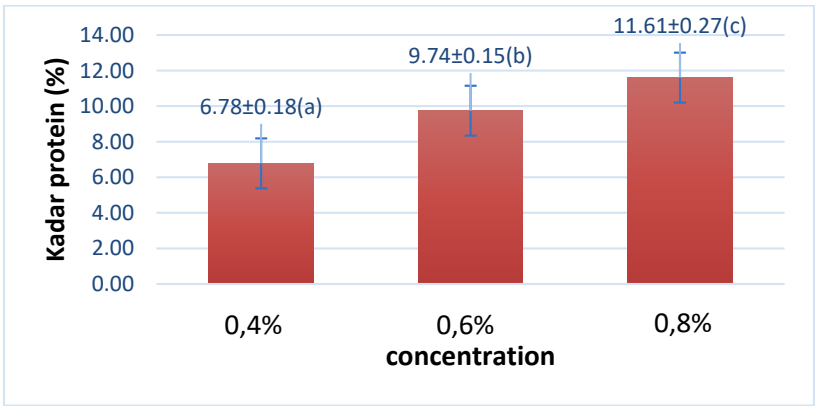

Figure 3. The Result of Protein Content

There are differences in protein levels in collagen ointment from differences in collagen concentrations. At a collagen concentration of 0.4%, a protein content of 6.78% was obtained, a concentration of 0.6% was 9.74% and a concentration of 0.8% was 11.61%. The value of protein content in collagen ointment shows an increase with differences in collagen concentration. The highest protein content in collagen ointment was with a collagen concentration of 0.8% at 11.61% and the lowest with a collagen concentration of 0.4% at 6.78%. It can be concluded that the higher the collagen concentration, the higher the protein content.

3.5 Fat Content

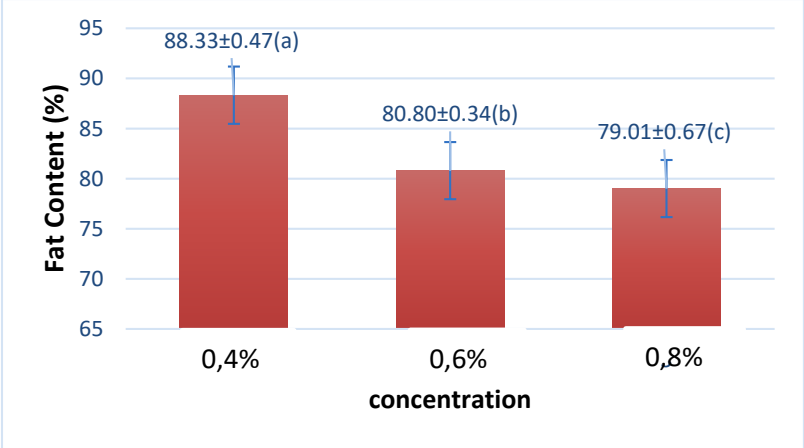

Figure 4. The Result of Fat Content

Based on Figure 5, there are differences in the fat content of collagen ointment from differences in collagen concentrations. At a collagen concentration of 0.4%, a fat content of 88.33% was obtained, a concentration of 0.6% was 80.80%, and a concentration of 0.8% was 79.01%. The value of fat content in albumin ointment shows a decrease with increasing collagen concentration, this is because the amount of ointment base added along with the increase in collagen decreases.

3.6 Water Content

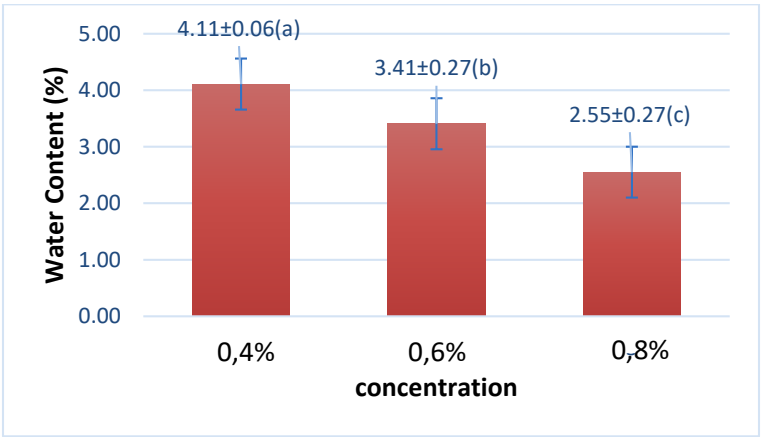

Figure 5. The Result of Water Content

At a collagen concentration of 0.4%, a water content of 4.11% was obtained, a concentration of 0.6% was 3.41%, and a concentration of 0.8% was 2.55%. The water content of the collagen ointment showed a decrease in line with the difference in collagen concentration. According to research by Chakim *et al*., (2014) that the final water content of a processed product depends on the type and amount of liquid added. Low water content can extend shelf life, because low water content can limit microbial growth and chemical reactions (Amanto *et al*., 2015).

3.7 Amino Acid Profile

No.	Parameter	Unit	Result
1.	L-Histidine	mg / kg	7953,99
2.	L-Threonin	mg / kg	32009,99
3.	L-Prolin	mg / kg	121672,79
4.	L-Tyrosin	mg / kg	4430,99
5.	L-Leucin	mg / kg	27642,52
6.	L-Aspartic Acid	mg / kg	41081,04
7.	L-Lysin	mg / kg	29005,85
8.	Glysin	mg / kg	254443,74
9.	L-Arginine	mg / kg	93756,70
10.	L-Alanin	mg / kg	80027,37
11.	L-Valin	mg / kg	23543,34
12.	L-Isoleucin	mg / kg	14185,78
13.	L-Phenylalaninw	mg / kg	23778,19
14.	L-Glutamic Acid	mg / kg	81131,23
15.	L-serin	mg / kg	39223,25

The highest amino acid content in tiger grouper skin collagen was glycine at 254443.74 mg / kg and the lowest was L-Tyrosine at 4430.99 mg / kg. The collagen of tiger grouper skin is then used as an active ingredient in collagen ointment. The results of the amino acid content of collagen ointment are as follows.

No.	Parameter	Unit	Result
1.	L-Histidine	mg / kg	217,02
2.	L-Threonine	mg / kg	694,98
3.	L-Prolin	mg / kg	2836,07
4.	L-Tyrosine	mg / kg	<66,93
5.	L-Leucin	mg / kg	641,09
6.	L-Aspartic Acid	mg / kg	1153,22
7.	L-Lysin	mg / kg	798,64
8.	Glycine	mg / kg	5597,56
9.	L-Arginine	mg / kg	2021,47
10.	L-Alanin	mg / kg	1961,40
11.	L-Valin	mg / kg	532,20
12.	L-Isoleucine	mg / kg	319,94
13.	L-Phenylalanin	mg / kg	450,18
14.	L-Glutamic Acid	mg / kg	2058,01
15.	L-serin	mg / kg	981,10

The highest amino acid content in collagen ointment was Glycine at 5597.56 mg / kg and the lowest was L-Tyrosine at <66.93 mg / kg. The high level of the amino acid glycine indicates the presence of collagen. In general, protein does not contain much glycine. The exception is collagen, where two-thirds of all amino acids are glycine. Glycine is a non-essential amino acid for humans (Sobri, *et. al*., 2017).

IV CONCLUSION

The conclusion obtained from this study is that 0.8% tiger grouper skin collagen is the optimal concentration to produce the best collagen ointment. including a pH value of 6.8, a viscosity value of 27909 cP, a protein content of 11.61, a fat content of 79.01, and a water content of 2.55.

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