DOI <https://doi.org/10.18551/rjoas.2020-11.13>

PROFILES OF OMEGA 6 FATTY ACIDS OF BLACK CUMIN OIL IN THE CORK-BASED ALBUMIN OINTMENT FOR WOUND CLOSURE

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ABSTRACT

The components for wound closure consist of albumin, collagen, omega 3, and omega 6. Black cumin oil (*habattussauda* or *Nigella sativa*) has been known to contain much of oleic and linoleic fatty acids, the kind of fatty acids available abundantly in nature. Albumin from cork fish (*Channa striata*), collagen from the skin of grouper fish, omega 3 from flaxseed oil, and omega 6 from black cumin oil are used as active ingredients in making ointments to speed up the process of wound closure. An ointment is a thick substance, usually containing medicine, that is put on the skin where it is sore or where there is an injury, to cure it. The results from phase 1 of the study showed that different concentrations of black cumin oil affected the quality of the albumin ointment in terms of pH, viscosity, omega 3 content, protein content, fat content, water content, fatty acid profile, and zinc content. The best albumin ointment was produced at the 5 mL concentration of the black cumin oil with the following results: 6.9 pH, viscosity 16844 cP, 17.33% omega 3, 2.73% protein content, 87.92% fat content, and 5.5% water content. The best ointment produced was then used in an experiment on mice. Observations on day 3, 5, and 7 showed the fastest wound closure process using the albumin ointment with 75% wound closure happened on day 7.

KEY WORDS

Fatty acids, albumin, wound closure, ointment.

Albumin is a family of globular proteins, often applied clinically to improve the nutritional status of patients and to speed up surgical wound closure. Albumin regulates the osmotic pressure in the blood—it maintains the presence of water in the blood plasma to maintain blood volume in the body (Firlianty and Pratasik, 2018; Suprayitno, 2014). One best source of albumin is cork fish—the albumin from the fish is very good for patients suffering from hypoalbuminemia (having low albumin in the body), for surgical wound closure, and for burns (Fitriyani and Deviarini, 2013).

The components for wound closure consist of albumin, collagen, omega 3, and omega 6 (Nicodemus *et al.*, 2014). Collagen plays a crucial role in the wound closure process. Collagen consists of three helices of α chains of polypeptides—the three helices are the basic structure of collagen or tropocollagen (Firdayanti and Suprayitno, 2019). Heat can change the composition of triple helices in collagen (Nugroho and Suprayitno, 2019). The present study used collagen from the skin of grouper fish since it is known to have the highest collagen content as compared to other fish (Siregar and Suprayitno 2019). Although it is required for good health, alpha-linolenic acid cannot be synthesized in the body (Putri and Ardiarina, 2016). The present study used flaxseed as the source of omega 3 since flaxseed has been known to provide omega 3 with such high alpha-linolenic acid, as much as 57%. The present study used black cumin as the source of omega 6 fatty acid.

Black cumin oil (*habattussauda*) has been known to contain much of oleic and linoleic fatty acids, the kind of fatty acids available abundantly in nature. The two fatty acids come from the leaves and seed oil of the black cumin (Suseno *et al.*, 2013). Albumin from cork fish (*Channa striata*), collagen from the skin of grouper fish, omega 3 from flaxseed oil, and omega 6 from black cumin oil are used as active ingredients in making ointments to speed up the process of wound closure. An ointment is a thick substance, usually containing medicine, that is put on the skin where it is sore or where there is an injury, to cure it

(Ainingsih, 2018). This study aimed at producing albumin extract with the addition of collagen and fatty acids from essential oil containing omega 3 and omega 6; the final product would be an ointment easily applied at wounds.

MATERIALS AND METHODS OF RESEARCH

The ingredients for making the albumin ointment consisted of the cork fish, collagen from the grouper fish, omega 3 from the flaxseed oil, and omega 6 from the black cumin oil. The collagen was processed using NaOH, citric acid, NaO, cellophane membrane, and distilled water. The additional ingredients for making the ointment were fillers in the form of wool fat (lanolin) and vaseline flavum purchased from a chemical shop, Makmur Sejati, in Malang, East Java. The analysis involved materials such as potassium sulfate (K_2SO_4), NaCl, H_2SO_4 , 3% boric acid, 0.02 N HCl, hexane, methylated spirits, distilled water, physiological solutions, and cotton. The experiment to test the produced ointment involved mice.

The study used an experimental design divided into two phases. The first stage was the making of the albumin ointment using different concentrations of black cumin oil. This phase resulted in different quality of ointments from the physical properties (viscosity and pH), chemical properties (protein, fat, and water content), omega 6, and organoleptic. The resulted ointments were analyzed using the *de garmo* method to know the best ointment. The second phase was to try the ointment resulted from the previous phase on animals and to compare the experiment with the negative and positive control. It was followed by the fatty acid profile and zinc tests.

Phase One:

The Making of the Albumin Extract. It started with preparing the ingredient, the fresh cork. The fish was washed, cleaned, and cut into small cubes. The fish was weighed 250 grams before steamed. It was steamed for 30 minutes at $70^\circ C$. After that, the fish was strained and the filtrate was taken. The cork extract was ready to use.

The Making of Collagen. It started with the ingredient, the skin of the grouper without scales. The skin was then cut into 1x1 cm and soaked in NaOH 0.1 M for 24 hours; the ratio of skin and NaOH solution was 1:10. After 24-hour soaking, the skin was removed and cleaned with distilled water. Then, the skin was soaked in the acetic acid solution for 24 hours; the ratio of skin and the acetic acid solution was 1:10. It was then put into the cellophane membrane, before being soaked in 0.1 M acetic acid for 6 hours. After that, the skin was soaked in distilled water until it reached a neutral pH. The collagen from the grouper skin was ready to be used.

The Making of the Albumin Ointment. The albumin ointment was produced in the first Beaker. The butylated hydroxytoluene (BHT) was added before being crushed. Then, the albumin extract and some adeps lanae were added; the mixture was stirred until it became homogenous and then the lanolin was added. The ingredients from the first and the second Beaker was mixed. Then, the black cumin oil was added with different concentrations of 1 ml, 3 ml, and 5 ml. The collagen from the grouper skin was then added followed by vaseline flavum. All of the ingredients were stirred until homogenous before moved into a jar.

pH Analysis. To measure the pH of the ointment, one gram of ointment was diluted with 10 ml of distilled water. The pH was measured using a pH meter. The pH of the topical ointment had to be similar to the skin pH at 4.5 to 6.5.

Viscosity Analysis. It started with mounting the rotor on the test equipment—the rotor was immersed in the gel. Then, the test equipment was activated and the scale was read until it reached a stable position.

Protein Content Analysis. Protein content analysis was carried out using the Spectrophotometric method. Measurement of protein levels was carried out by taking 0.9 ml of protein samples. It was added with crystal ammonium sulfate then centrifuged for 10 minutes. The clear part (supernatant) was separated. The precipitate, which was a protein, was then reconstituted with acetic acid buffer pH 5 to 10. In the test tube, 0.9 ml of each sample was added, 0.8 ml of biuret reagent was added, and 1.3 ml of an acetic acid buffer

solution was added. It was then let to stand for 10 minutes before the absorbance, at the maximum wavelength, was read on the detection screen.

$$\text{Protein level (\%)} = \frac{V_{\text{standard}} - V_{\text{blanko}} \times N_{\text{standard}} \times 14 \times 6.25}{\text{sample weight}} \times 1000 \times 100$$

Fat Content Analysis. The fat content was analyzed using the Soxhlet method. The procedure was as follows. First, 2 grams of sample (W1) was put onto the filter paper and put into the distillation arm, then into the flask that had been weighed with fixed weight (W2)—this was then connected to the Soxhlet tube. The distillation arm was put into the Soxhlet extractor chamber and doused with a fat solvent. The extraction tube was installed in the Soxhlet distillation device and then heated at 40°C with an electric heater for 6 hours. The fat solvent in the flask was distilled off until all solvent evaporated. During distillation, the solvent would be accumulated in the extractor chamber for removal so it did not return to the flask. Then, the flask was dried in an oven at 105°C, then, it was cooled in a desiccator until its weight is constant (W3). The fat content was determined by using the following formula:

$$\% \text{ fat} = \frac{w3 - w2}{w1} \times 100\%$$

Water Content Analysis. Water content was analyzed using a dry oven method (thermogravimetric method) by weighing the initial weight of the sample (gram). Then, the sample was placed in the oven tray and it was heated at approximately 110°C for 2 hours to let it completely dry (homogenous). If the sample reached such a constant weight (there were no changes in the weight), it was ready for analysis using the following formula:

$$\% \text{ water} = \frac{(\text{initial weight} - \text{final weight})}{\text{initial weight}} \times 100\%$$

Organoleptic Analysis. The organoleptic analysis was done visually by seeing the color and smell of the odor. The analysis involved scoring, by using figures ranging from 1 to 7.

Fatty Acid Analysis. 0.33 grams of the sample was added to a Beaker containing 10 ml of BF₃ methanol, then it was stirred and refluxed at 40°C for 1 hour on a hot plate. The reflux product was then cooled and put into a separating funnel. Later, 25 ml of distilled water was added, then it was extracted with the addition of 20 ml of n-hexane. This resulted in two (2) layers; the lower layer containing glycerol was separated and the upper layer containing methyl ester was re-extracted with 10 ml of n-hexane, then distilled water was added until it reached neutral pH. After that, 10 grams of anhydrite Na₂SO₄ were added to remove any water remained in the solution. Then, a separation process was carried out and the obtained filtrate was evaporated with a Buchi evaporator. The methyl ester mixture obtained was analyzed using Gas Chromatography-Mass Spectrometry (GC-MS) to determine its fatty acid profile.

Zinc Content Analysis. To test the zinc content, 2 grams of the sample was dried in the oven for 18-24 hours. Then, it was removed to the furnace. The ash from the furnace was added with 2 ml of distilled water, then the solution was diluted and strained. The filtrate was collected in a 50-ml volumetric flask. Then, the standard solution, blank, and sample were flown in an Atomic Absorption Spectroscopy (AAS); the absorbance was read at a wavelength of 213.6 nm.

Phase Two:

Animal Testing. In this phase, mice were used. The procedure involved slashing the back of the mice. Then, the best albumin ointment was applied. Observations were done on the wound closure process by measuring the length of the wound.

RESULTS AND DISCUSSION

pH Level. Different concentrations of black cumin oil in the ointment resulted in different pH. The concentration of 1 ml of black cumin oil resulted in pH 6.5, the concentration of 3 ml

of black cumin oil resulted in pH 6.7, and the concentration of 5 ml of black cumin oil resulted in pH 6.9. The highest pH value (6.9) was obtained with the highest concentration of black cumin oil (5 ml), while the lowest pH value (6.5) was obtained with the lowest concentration of black cumin oil (1 ml).

Figure 1 – pH Levels for Different Concentrations of Black Cumin Oil

Viscosity. Different concentrations of black cumin oil in the ointment resulted in different viscosity. The concentration of 1 ml of black cumin oil resulted in the viscosity value of 100094 cP, the concentration of 3 ml of black cumin oil resulted in the viscosity value of 12562 cP, and the concentration of 5 ml of black cumin oil resulted in the viscosity value of 16844 cP. The highest viscosity value (16844 cP) was obtained with the highest concentration of black cumin oil (5 ml), while the lowest viscosity value (100094 cP) was obtained with the lowest concentration of black cumin oil (1 ml).

Figure 2 – Viscosity for Different Concentrations of Black Cumin Oil

Omega 6. Different concentrations of black cumin oil in the ointment resulted in different omega 6 content. The concentration of 1 ml of black cumin oil resulted in 12.8% omega 6 content, the concentration of 3 ml of black cumin oil resulted in 15.7% omega 6 content, and the concentration of 5 ml of black cumin oil resulted in 17.33% omega 6 content. The highest omega 6 content (17.33%) was obtained with the highest concentration of black cumin oil (5 ml), while the lowest omega 6 content (12.8%) was obtained with the lowest concentration of black cumin oil (1 ml).

Figure 3 – Omega 6 for Different Concentrations of Black Cumin Oil

Protein Content. Different concentrations of black cumin oil in the ointment resulted in different protein content. The concentration of 1 ml of black cumin oil resulted in 1.11% protein content, the concentration of 3 ml of black cumin oil resulted in 1.88% protein content, and the concentration of 5 ml of black cumin oil resulted in 2.73% protein content. The highest protein content (2.73%) was obtained with the highest concentration of black cumin oil (5 ml), while the lowest protein content (1.11%) was obtained with the lowest concentration of black cumin oil (1 ml). Protein content analysis is important to determine the nutritional status as well as to determine the functional and biological properties of the protein. Albumin is one of the most common types of protein in blood plasma produced in the liver and released directly into the blood circulation (Sugianto *et al.*, 2019). Protein also comes from collagen; collagen indeed is the main protein that makes up the extracellular matrix components and is the most common protein found in the human body. Collagen is a group of proteins that can also be found in the binding tissues of animals, for example in bone, cartilage, muscle ligaments, and skin (Naswa and Suprayitno, 2019).

Figure 4 – Protein Content for Different Concentrations of Black Cumin Oil

Fat Content. Different concentrations of black cumin oil in the ointment resulted in different fat content. The concentration of 1 ml of black cumin oil resulted in 55.35% fat content, the concentration of 3 ml of black cumin oil resulted in 70.93% fat content, and the concentration of 5 ml of black cumin oil resulted in 87.92% fat content. The highest fat content (87.92%) was obtained with the highest concentration of black cumin oil (5 ml), while the lowest fat content (55.35%) was obtained with the lowest concentration of black cumin oil (1 ml).

Figure 5 – Fat Content for Different Concentrations of Black Cumin Oil

Water Content. Different concentrations of black cumin oil in the ointment resulted in different water content. The concentration of 1 ml of black cumin oil resulted in 8.17% water content, the concentration of 3 ml of black cumin oil resulted in 6.67% water content, and the concentration of 5 ml of black cumin oil resulted in 5.5% water content. The highest water content (8.17%) was obtained with the lowest concentration of black cumin oil (1 ml), while the lowest water content (5.5%) was obtained with the highest concentration of black cumin oil (5 ml). As the concentration of black cumin oil rose, the water content decreased due to the emulsion of water in oil (w/o).

Figure 6 – Water Content for Different Concentrations of Black Cumin Oil

Organoleptic Analysis. The analysis was done using the autoleptic test by giving scores on the texture parameters (Hidayat and Suprayitno, 2019). Different concentrations of black cumin oil in the ointment resulted in different organoleptic scores. The concentration of 1 ml of black cumin oil resulted in a score of 6.27 of the aroma parameter, the concentration of 3 ml of black cumin oil resulted in a score of 5.73, and the concentration of 5 ml of black cumin oil resulted in the score of 5.33. The highest score for the aroma parameter (6.27) was obtained with the lowest concentration of black cumin oil (1 ml), while the lowest score for the aroma parameter (5.33) was obtained with the highest concentration of black cumin oil (5 ml). This indicated that the panelists in this study did not approve of the strong aroma of the albumin ointment with 5 ml of black cumin oil.

Figure 7 – Organoleptic Assessment of Albumin Ointment

For the color parameter, the concentration of 1 ml of black cumin oil resulted in a score of 6.30, 3 ml resulted in a score of 6, and 5 ml resulted in a score of 5.77. The highest score for the color parameter (6.27) was obtained with the lowest concentration of black cumin oil (1 ml), while the lowest score for the color parameter (5.33) was obtained with the highest concentration of black cumin oil (5 ml). This indicated that the panelists in this study did not approve the color of the albumin ointment with 5 ml of black cumin oil since it became brownish in color.

Ointment Tests on Animals. After the best ointment had been produced in the first phase, the next step was to test in on animals to know how it worked to close the wound. Then, an analysis was done to know the fatty acid profile and the zinc content of the ointment. It was followed by a comparison of the results of the experiment on mice with negative and positive control. The procedure involved slashing the back of the mice as long as 2 cm. Then, the best albumin ointment was applied. Observations were done on the wound closure process for seven (7) days by measuring the length of the wound on day 1, day 3, say 5, and day 7.

Figure 8 – Wound Closure Process Day 3

Results on day 3 of observations showed different results for the experimental group and the control groups. For the negative control group, the wound length was 1.8 cm with 10% closure. For the positive control group, the wound length was 1.5 cm with 25% closure. For the experimental group using the albumin ointment, the wound length was 1.3 cm with 35% closure. The fastest wound closure on day 3 happened to the experimental group applying the albumin ointment (the wound length was 1.3 cm with 35% closure).

Figure 9 – Wound Closure Process Day 5

Different treatments resulted in different results on wound closure on day 5 of observations. For the negative control group, the wound length was 1.4 cm with 30% closure. For the positive control group, the wound length was 1.3 cm with 35% closure. For the experimental group using the albumin ointment, the wound length was 1.1 cm with 45% closure. The fastest wound closure on day 5 happened to the experimental group applying the albumin ointment (the wound length was 1.1 cm with 50% closure).

Figure 10 – Wound Closure Process Day 7

Table 1 – Fatty Acid Content

Types of Fatty Acids	Unit	Result
Single Unsaturated Fatty Acids (MUFA)		
Omega 9		
C 18: 1 (oleic acid)	%	10.10
Total	%	10.10
C 14: 1 (myristoleic acid)	%	0.89
C 16: 1 (palmitoleic acid)	%	2.80
Total	%	3.69
Polyunsaturated Fatty Acids (PUFA)		
Omega 3		
C 20: 5 (eicosapentanoic acid)	%	-
C 18: 3 (linolenic acid)	%	2.12
C 22: 6 (docosahexaenoic acid)	%	-
Total	%	2.12
Omega 6		
C 18: 2 (linoleic acid)	%	17.16
C 20: 4 (arachidonic acid)	%	-
C 20: 3 (eicosatrienoic acid)	%	-
Total	%	17.16
Saturated Fatty Acids (SFA)		
C 18: 0 (stearic acid)	%	6.74
C 16: 0 (palmitic acid)	%	2.29
C 12: 0 (lauric acid)	%	1.03
Total	%	10.06

Different treatments resulted in different results on wound closure on day 7 of observations. For the negative control group, the wound length was 1.2 cm with 40% closure. For the positive control group, the wound length was 1 cm with 50% closure. For the experimental group using the albumin ointment, the wound length was 0.6 cm with 70% closure. The fastest wound closure on day 7 happened to the experimental group applying the albumin ointment (the wound length was 0.6 cm with 70% closure).

Fatty Acid. The 20-gram albumin ointment tested showed different levels of fatty acid content. The highest fatty acid was for linoleic acid of omega 6 (17.16%), while the lowest fatty acid was for the myristoleic acid (0.89%). The high and low levels of fatty acid content in the albumin ointment might be caused by the addition of other substances and storage temperature. The higher the storage temperature, the lower the fatty acid content will be. Fatty acids are constituent of fat; they consist of saturated fatty acids and unsaturated fatty acids (Rasyid *et al.*, 2019).

Zinc Content. The best concentration of zinc in the albumin ointment was 0.35 mg/100g. The topical application of zinc is known to reduce the diameter of open wounds in patients with zinc deficiency and non-deficiency; it also accelerates revitalization. The anti-inflammatory effect of zinc and the increased levels of zinc in the blood suggest that zinc can penetrate deeper into the tissues and be absorbed into the blood circulation. In mice with zinc deficiency, there can be a decrease in DNA synthesis, a decrease in granulation tissue deposition, a decrease in the strength of wound stretch, and a delay in closing open wounds (Anggraeni *et al.*, 2012). Zinc is a part of minerals important for the body (Talib *et al.*, 2014).

CONCLUSION

The 5 ml concentration of the black cumin oil became the most optimal concentration for the best albumin ointment. The resulted ointment had pH 6.9, a viscosity of 16844 cP, an omega 6 level of 17.33%, a protein content of 2.73%, and a fatty acid content of 87.92%.

The fastest wound closure on the laboratory mice applied with the albumin ointment happened on day 7 of observations with 75% wound closure.

REFERENCES

1. Ainingsih, N. A. D. Pertiwi, Hardani. 2018. Formulasi Sediaan Salep Ekstrak Lidah Buaya (Aloe vera) Sebagai Obat Luka Sayat Pada Tikus Putih (*Rattus norvegicus*). Prosiding Seminar Nasional Kesehatan. ISBN: 978-602-50761-9-0.
2. Anggraeni, D., D. Adji and B. Sutrisno. 2012. Identifikasi Leptin pada Kesembuhan Luka Tikus yang Diberi Pakan Lemak Tinggi and Aplikasi Zinc Topikal. *Jurnal Veteriner*. 13(4): 395-401. ISSN: 1411-8327.
3. Firdayanti, W. and E. Suprayitno. 2019. Amino acid profile of gelatin extracted from the skin of starry triggerfish (*Abalistes stellaris*) and determination of its physical properties. *International Journal of Scientific and Research Publications*. 9(9):774-778. ISSN 2250-3153.
4. Firlianty and S. B. Pratasik. 2018. Potensi puding ikan toman (*Channa micropeltes*) and ikan gabus (*Channa striata*) untuk percepatan penyembuhan pada hewan uji tikus. *Jurnal Agribisnis Perikanan*. 11(2): 65-69. ISSN: 1979-6072.
5. Firlianty, E. Suprayitno, H. Nursyam, Hardoko and A. Mustafa. 2013. Chemical composition and amino acid profile of Channidae collected from Central Kalimantan Indonesia. *International Journal of Science and Technology*. 2(4):25-29. ISSN:2252-5297
6. Fitriyani, E. and I. M. Deviarni. 2013. Pemanfaatan ekstrak albumin ikan gabus (*Channa striata*) sebagai bahan dasar cream penyembuh luka. *Vokasi*. 9 (3):166-174. ISSN:1693-9085.
7. Hidayat, M.I., and E. Suprayitno. 2019. The effect of the addition of skim milk and natrium alginate to the quality of crude albumin fish cork (*Ophiocephalus striata*) (Drying with vacuum drying). *International Journal of Scientific and Research Publication*. 9(5) : 202-209. ISSN: 2250-3153.

8. Naswa, A., and Suprayitno. 2019. Amino acid profile and characterization of gelatin from salmon skin. *International Journal of Scientific and Research Publications*. 9(9):643-646. ISSN: 2250-3153.
9. Nicodemus, M. Andrie and S. Luliana. 2014. Uji efek penyembuhan luka sayat ekstrak ikan toman (*Channa micropeltes*) secara oral pada tikus putih jantan wistar. *Jurnal Mahasiswa farmasi Fakultas Kedokteran UNTAN*. 1-14.
10. Nugroho, A., and E. Suprayitno. 2019. Effect of extraction time on gel strength, viscosity, and amino acid of gelatin fish bones *Pangasius hypothalamus*. *International Journal of Scientific and Research Publications*. 9(9):667-670. ISSN: 2250-3153.
11. Putri, R.I., and M. Ardiaria. 2016. Pengaruh Pemberian Kombinasi Minyak Rami Dengan Minyak Wijen Terhadap Kadar SGPT Sprague Dawley Dislipidemia. *Journal of Nutrition College*. 5(4): 504-512. ISSN: 2337-6236
12. Rasyid, R. P., E. Suprayitno, and T. D. Sulistiyati. 2019. The effect of the addition of Arabic gum to amino acid profile and fatty acid profile of albumin powder cork fisk (*Channa striata*). *International Journal of Scientific and Research Publications*. 9(5):657-661. ISSN: 2250-3153.
13. Siregar, G.R.M., and E. Suprayitno. 2019. Amino acid composition of gelatin from *Epinephelus* sp. *IOSR Journal of Agriculture and Veterinary Science*. 12(4): 51-54. ISSN: 2319-2372.
14. Sugianto, E. Suprayitno, and B. B. Sasmito. 2019. The effect of the addition of dextrin and Arabic gum to the quality of crude albumin fish cork (*Ophiocephalus striatus*). *International Journal of Scientific and Research Publications*, 9(7):396-400. ISSN: 2250-3153.
15. Suprayitno, E. 2014. Profile Albumin Fish Cork (*Ophiocephalus striatus*) Of Different Ecosystems. *International Journal of Current Research and Academic Review*. 2(12): 201-208. ISSN: 2347-3215.
16. Suseno, S. H., Nurjanah, and T. Faradiba. 2013. Profil asam lemak and kestabilan produk formulasi minyak ikan and habbatussauda. *JPHPI*. 6(12): 142-149.
17. Talib, A., E. Suprayitno., Aulani'am, and Hardoko. 2014. Therapeutic dose of madidihang fish bone flour and CaCO_3 towards calcium and phosphorus content in blood serum and bones of ovariectomy rat. *International Journal of ChemTech Research*. 6(14): 5529-5534. ISSN: 0974-4290.