

Oral internasional 3

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POTENTIAL OF CATFISH OIL EXTRACT (*PANGASIUH HYPOPHTHALMUS*) IN WELL PAIN HEALING WHITE RAT

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ABSTRACT

Catfish oil extract contains albumin and ω -3 fatty acids which play a role in wound healing. The purpose of this study was to determine the potential of catfish oil extract (*Pangasius hypophthalmus*) in healing white rat wounds on the area of the wound and the percentage of wound healing. Rats were grouped into 7 treatments, namely positive control with administration of betadin ointment, negative control was not given and 4 other treatments with administration of catfish oil extract (A, B, C, D), treatment E was given tween 20. White rats were injured in the area back with a length of 2 cm and a depth of 2 mm. Rat treatment is done for 7 days topically. The results of analysis in this study showed that catfish oil extract (*Pangasius hypophthalmus*) has the potential to heal the wounds of white rats in the presence of decreased wound area of about 0.62 mm - 0.84 mm and the percentage of wound healing around 79.00% - 84,45%.

Keywords: Albumin, catfish, wounds, omega 3

Introduction

Wounds are lost or damaged components of a network that causes the separation of tissue structures that were originally normal. The skin is the main target of injury because the skin has an important role in protecting the body from UV rays and others. Accidents that quite often damage the skin tissue in the form of open wounds caused by knife cuts or sharp objects. According to RISKESDAS in 2007 the highest incidence in the case of housewives was 25.4% which resulted in open wounds or *Vulnus apertum* and the events caused by blunt and sharp objects were 32.2%. The process of wound healing through several phases, namely inflammation, proliferation and remodeling. The purpose of wound healing is to repair and restore damaged tissue. Wound healing is influenced by the role of proteins. an important component of protein is albumin. Albumin is useful in the process of healing body tissues. Patin fish oil contains fatty acids and albumin which play an important role as an anti-inflammatory, at the stage of proliferation and maturation plays a role in collagen synthesis. Omega 3 is a source of unsaturated fatty acids in people's nutritional needs. Toman fish extract (*Channa micropeltes*) in the form of an ointment proves the existence of wound healing activity for 7 days. Toman fish ointment provides wound healing activity as seen from the wound cover by measuring the area of the wound and the percentage of wound healing. This research is expected to have the potential of catfish extract (*Pangasius*

hypophthalmus) extract in the wound healing process as measured by measuring the area of the wound and the percentage of wound healing. Based on the above explanation, the author wishes to examine the extract of catfish oil which is expected to be useful for treatment in wound healing by conducting research on the percentage of wound healing. This research will be the starting point of treatment that is economically valuable and has high nutritional value for humans, so in this study it was tested first on experimental animals.

METHOD

Place and time Sampling was conducted at BPBAT (Balai Aquatic Freshwater Fish Aquaculture) Mandiangin. South Kalimantan.

Materials and Tools

Ingredients used in fish oil extract are catfish, distilled water, 1% bentonite, white rat, husk, standard feed, ether, 70% alcohol, betadine ointment, tween 20 and NaCl 0.9%. The tools used in these are knives, scales, pans, magnetic stirrer hotplates, spatulas, filters, separating funnels, centrifuges, beaker cups, test tubes, cages, rat drinking bottles, measuring flasks, analytical balances, veterinary surgical instruments, scapel no. 11, cotton, ruler, shaver, syringe without needle 1 cc, icebox, frame. Research subject The experimental animals used were male white rats. The male white rats used in this study were 42 mice. Rats were divided into 7 treatments with each treatment totaling 6 rats. Research procedure Making Patin Fish Oil Extraction Catfish cleaned and removed its entrails then cut into pieces and weighed as much as 750 g. Clean catfish is boiled in stainless pan and 500 mL of distilled water is added. Boil catfish that has been boiled stirred slowly for 30 minutes. The patih stew is separated with catfish meat and crude oil is done with a sieve. The crude oil obtained is separated again with a separating funnel in order to obtain pure oil. Pure oil is put into the beaker and then heated to a temperature of 49 ° C for 5 minutes and added bentonite by 1%, then reheated with a temperature of 49 ° C for 30 minutes. Separation of pure oil with the remaining pulp by using centrifugation at a speed of 10,000 rpm for 10 minutes

Albumin Testing Patin fish oil extract was tested qualitatively and quantitatively.

Qualitative test uses biuret and xanthoprotein testing. Biuret testing is 1 mL of fish oil sample put into a test tube and biuret reagents are added (3 drops of concentrated NaOH solution and 2 drops of 5% CuSO₄ solution). Samples of fish oil are shaken and changes are observed. The xanthoprotein test is 1 mL of fish oil sample inserted into a test tube and added 1 mL of concentrated HNO₃. The fish oil sample is then heated and changes occur. The fish

oil sample was cooled and divided into 2. Tube 1 added NaOH and tube 2 without NaOH. Observe the changes that occur in tube 1 and tube 2. Quantitative test on albumin is carried out by the spectrophotometric method which is located in Laboratory of Brawijaya University Malang Making Vegetable Wounds and Wound Care in Mice Each group of rats was given anesthesia using ether. Hair that is around the backs of mice is smeared with 70% alcohol using cotton. The mouse hair is then shaved. Mice that had shaved their hair were adapted for 2 days. The making of a cut is done on the back of a rat with a length of 2 cm and a depth of 2 mm using a sterile scaple. Cut wounds in rats were cleaned with 0.9% NaCl solution. Administration of catfish oil extract in white rats is applied once a day for 7 days. This wound treatment is applied using a 1 cc syringe without needle. Wound Measurement and Observation Mouse cut wounds photographed one by one using the frame that has been made. Photos generated using frames are entered into the Macbiophotonic Image J. program. The results obtained using cm units are then converted to mm. The resulting area is changed to the percentage of wound healing with the formula.

$$p \% = \frac{do - dx}{do} \times 100\%$$

Keterangan:

P% = Percentage of healing

do = n1

dx = n0

Data analysis

The results obtained from the Macbiophotonic Image J program will be followed by variation analysis (ANOVA).

RESULTS AND DISCUSSION

Patin Fish Oil Extract Catfish are used for extraction of 3 animals with a weight of about 2 kg. Complete results in the extraction process (Table 1)

Table 1. Results of catfish oil extraction

Stages of fish oil extraction	Fish oil extraction results
Catfish	2 kg (700-750 gr)
Aquades	6 liter
Fish dregs	901,6 gr
Crude oil	90 mL
Pure oil	60 mL

Albumin Testing

The qualitative testing of catfish oil albumin Biuret method, produces purple and Xanthoprotein method produces orange and yellow. This positively contains albumin. Quantitative testing of albumin levels was 181.73 mg / 100g.

Potential of Healing Wounds in the Area of Vegetable Wounds

Table 2 Results of Average Wound Area (mm) of Vegetables in White Rats (Mean \pm SD)

Group	Days to-			
	1	3	5	7
+	2,90 \pm 0,33 ^a	2,14 \pm 0,60 ^a	1,11 \pm 0,35 ^a	0,57 \pm 0,13 ^a
-	2,90 \pm 0,45 ^a	2,12 \pm 0,43 ^a	1,47 \pm 0,37 ^a	1,16 \pm 0,32 ^b
A	2,90 \pm 0,47 ^a	2,35 \pm 1,24 ^a	1,81 \pm 1,02 ^a	0,66 \pm 0,28 ^a
B (5%)	2,90 \pm 0,67 ^a	2,32 \pm 0,54 ^a	2,28 \pm 1,28 ^a	0,84 \pm 0,23 ^a
C (10%)	2,91 \pm 0,75 ^a	2,28 \pm 0,61 ^a	1,90 \pm 0,67 ^a	0,83 \pm 0,57 ^a
D (15%)	2,92 \pm 0,44 ^a	1,34 \pm 0,43 ^a	1,16 \pm 0,18 ^a	0,62 \pm 0,12 ^a
E	2,93 \pm 0,56 ^a	2,27 \pm 0,45 ^a	1,36 \pm 0,18 ^a	1,14 \pm 0,83 ^{ab}

Based on the above table, the results obtained on the 7th day of the administration of catfish oil extracts with treatments A and D have the area of the wound area close to the area of the

wound area with positive control. Giving catfish extract oil treatment A, B, C, D has a decrease in the value of the area of the wound that is not significantly different from positive control. Treatment D in the administration of fish oil extract had the highest reduction in wound area when compared with other treatments namely 0.62 mm. The treatment of E by giving tween 20 on the reduction in the area of the wound was not significantly different from the negative and positive controls.

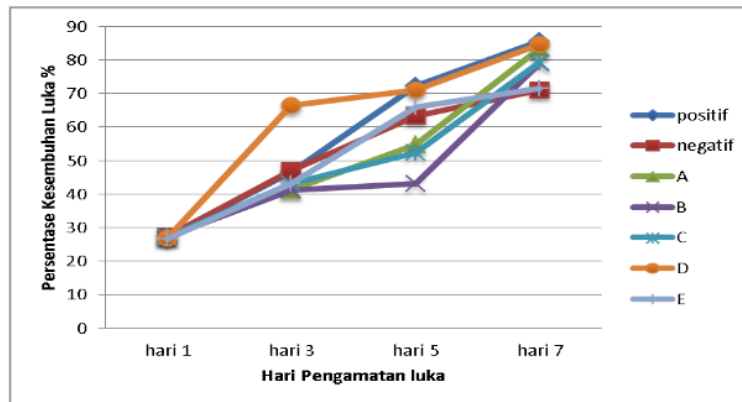
The Potential of Healing Wounds in the Percentage of Wound Healing

Table 3 Average Results Percentage of Healing White Mouse Wounds (Mean \pm SD)

Kelompok	Hari ke-			
	1	3	5	7
+	27,45 \pm 8,43 ^a	46,40 \pm 15,07 ^a	72,18 \pm 8,76 ^a	85,65 \pm 3,35 ^b
-	27,35 \pm 11,50 ^a	46,95 \pm 10,82 ^a	63,21 \pm 9,31 ^a	70,91 \pm 8,11 ^a
A	27,35 \pm 11,80 ^a	41,91 \pm 31,05 ^a	54,73 \pm 25,57 ^a	83,36 \pm 7,17 ^b
B (5%)	27,35 \pm 16,82 ^a	41,91 \pm 13,55 ^a	43,03 \pm 32,25 ^a	79,00 \pm 5,90 ^b
C (10%)	27,15 \pm 18,95 ^a	43,01 \pm 15,28 ^a	52,43 \pm 16,83 ^a	79,16 \pm 14,46 ^b
D (15 %)	26,90 \pm 11,11 ^a	66,31 \pm 10,85 ^a	70,98 \pm 4,61 ^a	84,45 \pm 3,05 ^b
E	26,70 \pm 14,25 ^a	43,15 \pm 11,46 ^a	65,95 \pm 4,57 ^a	71,40 \pm 20,75 ^{ab}

Based on the table above, the results obtained on the 7th day of the administration of catfish oil extracts with treatments A and D have a wound healing percentage value close to the percentage of healing with positive control. Giving catfish extract oil treatment A, B, C, D had an increase in percentage that was not significantly different from positive control. Treatment D in the administration of fish oil extract has an increase in the percentage of wound healing when compared with positive control that is 84.45%. Treatment of E by giving tween 20 on the percentage of wound healing was not significantly different from negative and positive control.

Percentage of wound healing after administration of catfish extract oil



The percentage graph of wound healing in Figure 12 shows the differences in wound healing in increasing wound cover. The first day to the seventh day positive control is faster than negative control and E treatment in the wound healing process. Provision of catfish extract oil in treatments A, B, C and D showed an increase from the first day to the seventh day in the wound cover. Treatment A and D experienced an increase in the percentage approaching positive control. This shows that catfish oil extract was able to heal wound cuts in white rats, while negative controls and E showed a decrease in wound healing when compared with positive controls.

Discussion

This study shows that the 1st day to the 5th day there were no significant differences between groups, but on the 7th day showed a significant difference in the treatment given with the control of catfish extract with negative control. This shows that the catfish oil extract which is given by applying can give the potential for wound healing with a reduction in the wound area by 0.62 mm - 0.84 mm and an increase in the percentage of wound healing by 79.00% - 84.45%. Wound healing process there are 3 stages: 1) The inflammatory phase lasts for 3 days. Stages of inflammation are characterized by increased blood flow and blood capillary permeability which will be followed by vasodilation during injury. 2) The proliferation phase takes place after 4 days of injury. Fibroblasts will help the collagen to synthesize collagen that starts with the closure of the wound edges and then forms granulation tissue. 3)

Maturation phase is a remodeling phase that serves to increase the strength of the strain on the wound. During the maturation phase, collagen will slowly close the optimal wound area. Role of Albumin in wound healing 1) Regulating osmotic pressure in the blood in the inflammatory phase 2) Albumin plays a role in the development of granulation tissue in the proliferation phase. 3) Albumin helps in collagen synthesis. W-3 and w-6 fatty acids have anti-inflammatory effects that occur during the inflammatory phase. Omega 3 has forms in EPA and DHA. Arachidonic acid (AA) is a derivative of omega 6. Arachidonic acid in the oxygenase process is assisted by the cyclooxygenase (COX) enzyme which will produce prostaglandins (PG), thromboxane (TX) and protacyclin. Arachidonic acid (AA) aided by the enzyme lipooksigenase (LOX) will produce leukotrin (LT). Leukotrin (LT) plays a role in phagocytosis. Neutrophils will signal to combine more neutrophils and leukocytes in order to carry out phagocytosis. The action of neutrophils to carry out phagocystosis must be prevented from damaging new tissue and will be assisted by the enzyme 15-LO (15-lipooksigenase) which turns into lipoxins. Lipoxins act as anti-inflammatory. Anti-inflammatory mediators in addition to lipoxins are also derivatives of EPA, namely resolvins E1 (Rvs) and DHA derivatives, namely Protection D1 (PD). W-3 fatty acids, EPA, play a role in the development of granulation tissue which is a cellular component of fibroblasts that will synthesize collagen.

CONCLUSION

Patin fish oil extract has the potential for wound healing in white rat wounds to the area of the wound showed a decrease in the area of 0.62 mm - 0.84 mm and an increase in the percentage of wound healing that is 79.00% - 84.45%.

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