

The Effect of Giving Glucomannan Porang Tuber (*Amorphophallus oncophyllus* Prain ex Hook. F.) on SGPT and SGOT Levels of Wistar Male Rats Blood Induced By Paracetamol

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Abstract—Indonesia is a country with a high prevalence of liver disease. Liver is important for survival and plays a role in every metabolic function of the body. One of the causes of liver disorder is because of drugs. One of the drugs that cause liver damage is paracetamol. Glucomannan is a major component of the porang tuber that serves as a soluble fiber. Glucomannan is thought to have hepatotherapy effects as a potential antioxidant.

The aim of this study is to determine the effect of glucomannan porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F.) with graded doses of the blood levels of SGPT and SGOT wistar male rats induced by paracetamol dose of 1,638 g/kg BB.

This research was experimental study. The treatment in this study was porang glucomannan with a dose of 25 mg / kg, 50 mg / kg and 100 mg / kg. The Population of the study was white male of Wistar rats aged 3-4 months with a weight of 180g - 250g, and healthy.

The result of the analysis showed that glucomannan Porang (*Amorphophallus oncophyllus* Prain ex Hook. F.) has an effect as hepatotherapy. Giving glucomannan porang at a dose of 50 mg / kg rat has an effect to decrease blood levels of SGPT and SGOT wistar male rats induced by paracetamol.

Keywords: Porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F.); SGPT; SGOT

I. INTRODUCTION

Liver damage can disrupt a variety of important metabolic processes of the body and lead to various diseases. One of the drugs known to be hepatotoxic are paracetamol. At normal

doses, paracetamol can be used for therapeutic so it is relatively safe, but when it is used in high doses or low doses but in the long term, then paracetamol can cause liver damage.

One part of the plants that is interesting to study is glucomannan porang (*Amorphophallus oncophyllus* Prain ex Hook. F.). This plant belongs to the family Araceae. One similar plants of the same family is white porang tuber (*Amorphophallus konjac* K.Koch) and suweg tuber (*Amorphophallus campanulatus*). Based on research conducted by Singh, S, K., et al (2011) plants of the family with the porang tuber that was suweg tuber (*Amorphophallus campanulatus*) which its methanol extract was taken can be used as hepatotherapy. The results obtained in the methanol extract of the suweg tuber dose of 500 mg / kg decrease in parameters: serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT) and alkaline phosphatase (ALP) occurred at 55.43%, 60.41% and 48,10%. Research conducted Nugraheni et al. (2013) also examined hepatotherapy on plants from the family Araceae that was the porang tuber (*Amorphophallus konjac* K.Koch). The results showed that by giving porang tuber flour (*Amorphophallus konjac* K. Koch) at a dose of 2000 mg / kg rat has an effect to decrease levels of SGPT and SGOT blood and liver histopathology picture of wistar male rats induced by paracetamol.

Based on the previous research mentioned

above, the researchers are interested in conducting a research on glucomannan Porang (*Amorphophallus oncophyllus* Prain ex Hook. F.) that can be used as nutrasetikal primarily to prevent heart disease or as hepatotherapy.

II. MATERIALS AND METHODS

A. Instruments

Analytical balance (Sartorius), tools glass (glass beaker, funnel glass, stir bar, and a measuring cup), animal cages, a syringe injection with a blunt end needle (sonde), scales ohaus, centrifuges, spectrophotometer ABX Pentra 400.

B. Materials

Porang tubers (*Amorphophallus oncophyllus*) obtained from the Ponorogo, East Java, paracetamol, wistar male rats, TRIS buffer pH 7.5, L-aspartic, MDH, LDH, 2-Oxoglutarate, NADH, and L-alanine.

C. The Process

1. Treatment of samples

Porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F.) was peeled, cleaned with water, soaked with NaCl, then washed and dissolved in 600 mL of water temperature of 75 ° C, added salt as much as 0.6 grams of aluminum sulfate and stirred for 35- 60 minutes. The solution obtained was filtered using a flannel. The filtrate obtained is mixed with isopropyl alcohol in the ratio 1: 1. Then stirred to agglomerate glucomannan, glucomannan coagulated white jelly-like. Then dried to a constant weight, the dried glucomannan was in the form of a gray or brown thin sheet.

2. Suspension of porang tuber

Weighed as much as 10 grams of glucomannan porang tuber plus 100 mL of hot distilled water, stirred and then filtered. The filtrate obtained was concentrated in a water bath until thick filtrate was obtained from glucomannan porang tuber.

3. Determination of the porang tuber dose

Determination of glucomannan tubers porang dose was based on the literature (Kumar et al., 2013: 204) that doses of 25-50 mg / kg glucomannan are able to lower cholesterol levels in the blood. Determination of the dose was also used to reduce levels of SGPT and SGOT.

4. Giving a dose of Paracetamol

Effects of acute paracetamol hepatotoxicity may occur after taking a single dose of 10-15 g (150-250 mg / kg) (Goodman and Gilman's, 2008: 683).

Paracetamol and porang are poorly soluble in water so that they were made in the form of a

5. Test of hepatotherapy

A number of 50 wistar male rats adapted for 7 days, then they were divided into five groups. Group I was given a suspension of glucomannan porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F) a dose of 25 mg / kg body weight of mice, the second group was given a suspension of glucomannan porang tuber with dose of 50 mg / kg body weight of mice, and the third group was given a suspension of glukomanan porang tuber with dose of 100 mg / kg, the fourth group as a positive control group was given CMC Na 0,5%, and the fifth group as the normal control group. The treatment of giving the glucoman porang tuber with different dosis was conducted over four days, one hour after administration on day 4 was given paracetamol dose of 1.638 g / kg in group II, III, IV and V. On the 5th day of venous blood was collected through the eye, SGPT and SGOT blood levels was measured.

D. Analysis of SGPT and SGOT levels

SGPT enzyme levels were analyzed by a kinetic method based on the recommendations of the IFCC Expert Panel using the ABX Pentra 400 analyzer and reagents ready to use GPT (ALT) and GOT (AST).

III. RESULTS AND DISCUSSION

The Plants that were chosen as samples were porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F). The Part of the plant used in this study was tuber, tubers were then carried out by dispersing theirs glucoma. Glucomannan is polysaccharide in the family of mannan. Glucomannan consists of monomer α β -1,4-mannose and α -glucose. Glucomannan contained in illes-illes and porang tubers that can strengthen the gel, improve texture, thicken, and so forth (Sande et al. 2008).

Making the glucomannan from porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F), was done by dissolving, filtration, sedimentation and until dried. Then powdered glucomannan to obtain glucomannan.

Phytochemical screening test results indicate that glucomannan powder did not contain saponins, phenolic, alkaloids, tannins but carbohydrates. This was confirmed in research conducted by Pregiwati, et al (2014) that by TLC densitometry, glucomannan of porang tubers contain active substances of glucomannan.

The chosen Dose of paracetamol as inducer of rat liver damage was a single dose of 1.638 g / kg. The dose was obtained through orientation. suspension by the addition of a suspending agent CMC Na 0,5%.

Table 1. Results of the average levels of SGPT and SGOT (U / L) for each treatment group

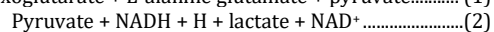
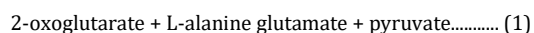
No	Group	SGPT U/L			% decreased	SGOT U/L			% Decreased
		H0	H4	H11		H0	H4	H11	
1	I Dose of 25 mg/kgBB	57.7	146.9*	50.1 ^a	60.3	125.1	221.4*	96.5 ^a	55.1
2	II Dose of 50 mg/kgBB	57.3	303.1*	56.2 ^a	80.9	112.9	378.8*	111.3 ^a	69.4
3	III Dose of 100 mg/kgBB	60.9	146.7*	49.3 ^a	65.2	137.2	241.2*	104.6 ^a	56.4
4	IV CMC-Na 0,5% (Kontrol -)	56.4	147.5*	121.3	16.0	108.6	205.6*	224.7	-9.3
5	V Normal (Kontrol +)	59.1	65.4	61.0	5.7	125.5	107.3	109.0	-3.4

Description:

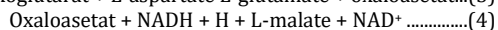
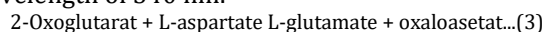
* : there were no differences in levels of ALT / AST between day 0 and day 4 with T test

^a : there were differences in levels of ALT / AST when compared to the group IV with Post Hoc test

Serum ALT activity was measured quantitatively with the analyzer ABX Pentra 400 using a kinetic-ALAT GPT (glutamate pyruvate transaminase Amino-Alanine transaminase). The Serum that will be analyzed was reacted with 2-oxoglutarate and L-alanine in a buffer solution. SGPT enzymes found in the serum will catalyze the transfer of the amino group of L-alanine to 2-oxoglutarate according to equation (1). Pyruvate formed by NADH in the presence of lactate dehydrogenase (LDH), enzymatically converted to lactate as shown in equation (2).



This examination would measure the residual unreacted NADH. The use of NADH was proportional to the SGPT activity. For SGOT was determined by the same method, involving oxaloacetate formed from the corresponding equations aspartate 3. dehydrogenase Malate changed oxaloacetate into malate and NADH was converted to NAD according to the equation 4. The formed NAD + can be measured at a wavelength of 340 nm.



Animal testing that had an increased SGPT and SGOT levels, then divided into four (4) groups. Group I was given a suspension of glucomannan porang (*Amorphophallus oncophyllus* Prain ex Hook. F) a dose of 25 mg / kg for 7 days, the second group was given a suspension of glucomannan porang with a dose of 50 mg / kg for 7 days, group III was given a suspension of glucomannan porang dose of 100 mg / kg for 7 days and the fourth group was given 0.5% CMC-Na for 7 days and on days 0, 4, 11, carried out with blood sampling and measuring the levels of SGOT

and SGPT. The results were as follows Table 1.

SGPT levels of both groups I, II, and III after being given treatment glucomannan for 7 days showed a decrement. The greatest percentage decrement in group II with a dose of 50 mg / kg, while the third dose was a dose of 100 mg / kg body weight were smaller. This can possibly occur because of the saturation of the carrier enzyme of active active compounds in the body so that the longer time to supply the dose the effects were not getting bigger.

The results obtained from ALT levels during the 7 days treatment of group IV as compared to the negative control group I, II, and III showed a difference. It indicated that glucomannan porang tuber with dose of 25 mg / kg, 50 mg / kg, and 100 mg / kg body weight has an effect as hepatotherapy.

Based on data in Table 1, the test animals also had increased levels of SGOT after being induced with paracetamol dose of 13 grams. This was also proved by the significant difference after T test between day 4 to day 0. SGOT levels in group I and II after being given treatment Porang tuber for 7 days showed a decrement. SGOT biggest percentage drop seen in the second group was 69.40%. Group III, which increased doses decreased in the percentage of group II. The decreased percentage in SGPT levels was higher than in SGOT, this was due to the increased levels of SGOT which was not always directly related to liver damage, since SGPT was a mitochondrial enzyme that was not only found in the liver, but also in the heart, skeletal muscle, and other organs. In addition, the stress factor was thought to be one of the trigger cell damage, which causes the levels of SGOT and SGPT exceed the levels normally found in the blood, because, according to Macfarlane (2000), in addition to chemical agents, stress factors such as lack of oxygen supply,

excessive physical activity, trauma, temperature unstable environment, was also one of the causes of cell damage.

Regeneration of the liver associated with inflammation in the early stages of the toxicity of the liver, because of the inflammation, then the inflammatory mediators such as cytokines, growth factor, prostaglandins or metabolites of oxygen that were secreted by inflammatory cells (macrophages and granulocytes) played an important role in the regulation process of regeneration cells. If the inflammation was pressed cent, then the regeneration process will be more prominent (Hans, 1993). According to Onishi (2007) glucomannan had anti-inflammatory effects by mechanisms suppress IL-10, IL-4 and other cytokines. The presence of anti-inflammatory effect on glucomannan will suppress inflammation on liver damage due to paracetamol, so it will trigger the regeneration of cells because inflammation plays a role in regulation of cell regeneration process.

IV. CONCLUSION

Glucomannan porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F.) can be used as hepatotherapy. Giving glucomannan porang tuber at a dose of 50 mg / kg rat can give an effect to a decrease in SGPT and SGOT levels in the blood of wistar male rats induced by paracetamol.

V. SUGGESTION

1. It is Needed to do a same research which a longer treatment time and different research methods to identify the potential hepatoprotective of porang tuber

(*Amorphophallus oncophyllus* Prain ex Hook. F.).
2. It is Needed to do another research on the toxicity of glucomannan porang tuber (*Amorphophallus oncophyllus* Prain ex Hook. F.) to determine the safety of the glucomanna flour.

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