

PROFIL Serum Glutamate Oxaloacetat Transaminase (SGOT) and Glutamate Pyruvate Transaminase (SGPT) LEVEL OF BROILER THAT WAS GIVEN NONI JUICE (*Morinda citrifolia*) AND PALM SUGAR (*Arenga piata*)

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Abstract

Bioactive compounds in noni fruit is proxeronine and proxeronase enzyme, can protect body cells from damage and enhance cell function, also can be used to protecting liver cell, and other compounds such as antioxidants and terpenes The Palm sugar as a source of energy. The study aimed to compare using Noni juice and Palm sugar on Serum Glutamate Oxaloacetat Transaminase (SGOT) and Glutamate Pyruvate Transaminase (SGPT) levels. Research involved 100 broiler chickens by using a Completely Randomized Design. Treatments were: ration without Palm Sugar (R0) and 3 rations which contained Noni juice and Palm Sugar at different levels, which were R1 (Palm Sugar 2% + Noni Juice 0.3%), R2 (Palm Sugar 3% + Noni Juice 0.3%), and R3 Palm Sugar 4% + Noni Juice 0.3%), each treatment was repeated 5 times, reared up to 4 weeks of age. Water were given ad libitum to all group. After four weeks, each group was observed level SGOT and SGPT. Result showed no significant difference using 3% NJ and 0.3% PS (R3) on SGPT level ($p > 0.05$), but tend to decrease until 25.94% (from 234,67 U/L to 186.33, U/L), compare to control, and R1 dan R2 gives the same respons with control. On the other hand, there were no significant ($p > 0.05$) difference found at all treatment on SGOT level, so the conclusion is using palm sugar and Noni juice can improve SGOT and SGPT level.

Key words: Noni juice (*Morinda citrifolia*), Palm Sugar (*Arenga piata*), SGOT, SGPT, Broiler

INTRODUCTION

One of many medicinal plants used in traditional medicine is noni (*Morinda citrifolia*). Noni has known and used as a plant believed to cure some diseases, such as liver disease, stomach ulcers, hypertension, diabetes [1]

In Indonesia Noni known as mengkudu/pace. It contain many nutrients that are terpenoid compounds are isometric hydrocarbons were also present on fats / oils essential function in organic synthesis and recovery of body cells. There are also a source of ascorbic acid or vitamin C, which is one great antioxidant, neutralizing free radicals function as a result of metabolic processes in the body. While anti-bacteria found in noni

fruit, in acubin form, L. asperuloside, alizarin, and some anthraquinone substances that can fight bacteria *Pseudomonas aeruginosa*, *Proteus morgani*, *Staphylococcus aureus*, *Bacillus subtilis* and *Escherichia coli* [2].

Noni can reduce blood cholesterol, Low Density Lipoprotein (LDL), Triglyceride and increased high density lipoprotein (HDL) [3] and also improve the structure of histology vessels (medial thickening) of the mice aorta that given high-fat diet [4]. Noni juice contains proxeronine, pectin, scolopetin, and ascorbic acid which able to reduce hypercholesterolemia. Using mixed noni juice and palm sugar, showed significant difference with mixed 3% PA and 0.3% NJ on fat percentage, i.e. lowering LDL = 38.6%, Cholesterol = 20.2%, Triglycerides = 46.2%. but not for HDL [5].

Proxeronine is a necessary enzyme in the biosynthesis of xeronine. Xeronine work on

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the molecular stage, a specific in the body's cells, such as mitochondria, microsomes, golgi apparatus, endoplasmic reticulum, dekrton transport system, DNA, RNA, and so on [6].

Xeronine also serves to wide the pores of the cell membrane that helps in supplying cell molecules such as proteins. Cells use proteins to maintain and improve working efficiency of these cells [7].

Palm Sugar is the process of dissolution into the body fluids occurred over a long/slowly, suspect it is able to provide energy in a longer time span. It contains riboflavin, can improve cell metabolism thereby making excellent health [17].

Liver acts as the most important organ in the body's metabolism. Abnormalities of liver function can be seen from the increased levels of alanine transaminase enzymes (AST) and Aspartat amino transaminase (ALT) were associated with liver cell damage /hepatocellular necrosis. Hepatic cell damage can be caused by load process excessive steroid hormone metabolism through a process of reduction, oxidation, hydroxylation, and conjugation. Liver is important organ has a variety of functions in the metabolic processes so these organs are often exposed to chemicals. exposure, chemical substance will experience detoksikasi and inactivation thus be harmful to the body [9], also liver injury due to drugs and chemicals may occur if the durability and liver regeneration reduced, ability of liver cells is lost and will cause permanent damage that can have an impact dangerous

Transaminases are a group of enzymes that act as biokatalisator in the process displacement between an amino group of alpha-amino acid alpha-keto acid [9]

Alanine amino transaminase (ALT) or Serum Glutamic Pyruvic Transaminase (SGPT) and aspartate amino transaminase (AST) or serum glutamic oxaloacetic transaminase (SGOT) contained large amounts in hepatocytes [8]. SGOT is sensitive indicators of the liver cells damage. SGOT are cytosolic enzymes, whereas SGPT are microsomal enzymes, including enzymes rise caused by viruses, drugs and toxic, and

will release into blood when the liver are damaged. Serum Glutamic Pyruvate Transaminase (SGPT) is an enzyme present in the cell liver. Its function is to convert the compound into a alfafetoglutarat aspartate and oxaloacetate and glutamate, [10]. Another case when the damaged cells liver and the walls are broken, SGOT and SGPT going out of the cell and into the bloodstream. As a result, the levels of SGOT and SGPT that there should be no or low in the blood, becomes high. which can cause liver cells damage including viral hepatitis, fatty liver, drug toxicity.

MATERIAL AND METHODS

One hundred day old chick, used randomizely with average body weight 50.10 grams, coefisien variation is 6.97%. This research were assigned randomly and studied for four weeks. The research was made using experimental method with a Completely Randomized Design (CRD). There were four treatments and each treatment was repeated five times. The dietary treatments are:

P0 = rasion without Palm sugar (P S) and Noni Juice (N J)

P1= rasion with P S 2% + N J 0.3%,

P2= rasion with P S 3% + N J 0.3%,

P3= rasion with P S 4% + N J 0.3%

The basal Feed was formulated with the basic ingredient such as corn, soybean meal, fish meal, coconut oil, with the addition of some essential amino acid like lysine and methyonine, premix and NaCl. The formulation of feed based on standard nutrient requirements and energy. Data collected at the end of experiment and variables measured is SGOT and SGPT.

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RESULTS AND DISCUSSIONS

The analysis of addition mixed Palm Sugar and Noni Juice, have no significant ($P > 0.05$) effect on SGOT and SGPT compared to control Although no significant difference, SGOT levels decreased 25.94% on R3 (NJ 4% + PS 0.3%). The reduction is very good / meaningful. More clearly can be seen in figures 1 and 2.

Table 1 Effect of *Morinda citrifolia* and *Arenga piata* on SGOT and SGPT (U/L)

Treatment	P0	P1	P2	P3
	U/L			
SGOT	234.67 ^a	251.33 ^a	257.00 ^a	186.33 ^a
SGPT	12.50 ^a	12.40 ^a	12.37 ^a	11.86 ^a

Note: The same letter on the same line show no significant difference ($P > 0.05$)

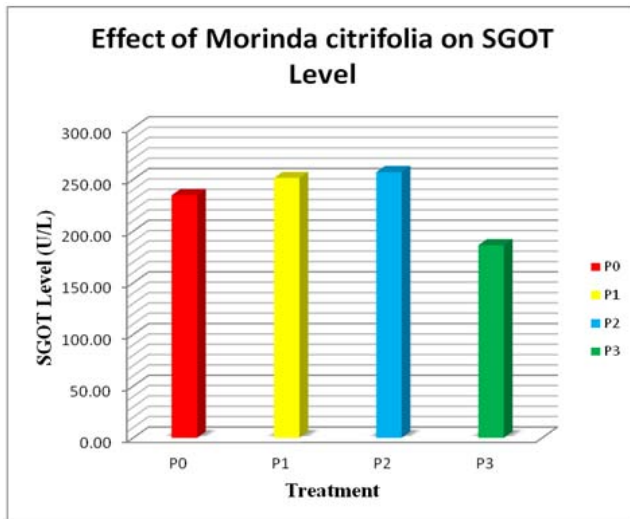


Fig. 1 Effect of *Morinda citrifolia* and *Arenga piata* on SGOT level

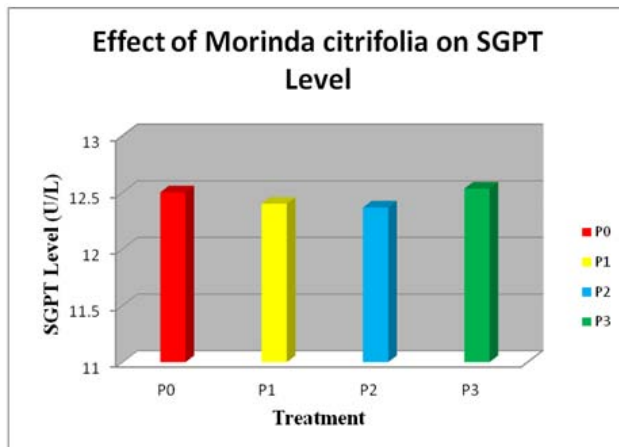


Fig. 2 Effect of *Morinda citrifolia* and *Arenga piata* on SGPT level

Elevated levels of AST and ALT enzyme is consistent with [12] those are not all derived from the liver, AST is an enzyme that is most found in muscle, heart and liver.

Noni extract provide barriers enzymes AST and ALT levels were fluctuating. Largest decrease in AST and ALT achieved in broiler group with PS 4% + NJ 0.3%, (treatment 3), decrease 25.94% for SGOT and 5.12 % for SGPT, so when there is injury to these cells, the levels of AST will increase.

The addition of noni juice showed hepatoprotective effects that may protect liver damage. Proxeronine compound and the enzyme proxeronase in noni juice can protect cells damage genetically and normalize cell functions [11], the other compound, terpenes function as cell rejuvenation [12].

Antioxidants contained in the noni fruit is phenolic and vitamin C, which acts as a free radical neutralizing of residual metabolism. The mechanism works by providing electrons or stopping the reaction of free radicals and prevent the continued chain of lipid peroxidation and protein. Active substances, antioxidant properties such as scopoletin, beta carotene, L-arginine, is protecting liver cell damage and inhibit the rise of SGOT and SGPT.

Palm sugar is the energy source of broiler, and is absorbed through the digestive tract. Disaccharide, sucrose or simultaneously absorbed more quickly as glucose and fructose when broken down in the 'brush border' intestinal mucosal cells. Palm sugar chemical compound is sugar: 9.16% moisture, 84% sucrose, 0.11% protein, 1.35% fat, 2.28% calcium, and 1.37% phosphorus. It contain higher sucrose sugar cane, sugar beet than the other sugar [13]. Palm sugar is believed more tolerant in the stomach or indigestion and expedite metabolism [14].

Excess glucose can be stored as glycogen.

Glycogen is stored in the liver and a lot of muscle. Glycogen any time reformed into monosaccharides and serves as a source of energy through glycogenolysis process therefore a mixture of the two material noni juice and *Alpinia galanga*, can collaborate

active compounds with maximum benefit, and using palm sugar 4% is optimal effect in this research.

Liver tissue contains more SGOT than SGPT [15]. SGPT most commonly found in the liver, so as to detect liver disease, ALT is considered more specific than AST. Elevated levels of SGOT and SGPT would happen if the release of intracellular enzymes into the blood caused necrosis liver necrosis cells or the presence of acute liver damage [16].

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CONCLUSIONS

1. Using Noni (*Morinda citrifolia*) juice 0,3% until 3% and Palm Sugar (*Arenga piata*) 2% in the drinking water of broiler chicken gives the same response on SGPT and SGOT.

2. Using 4% Noni (*Morinda citrifolia*) Juice and 0.3% Palm Sugar (*Arenga piata*) is the optimal level, decreased 25.94% SGPT level compare to control, and gave same responses of SGOT.

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