

Annona muricata Linn Leaf Effect in Inhibiting SGPT Elevation

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Abstract

Background : Hepatitis is an infection or inflammation disease of the liver which is caused by virus, toxic substance, and immunological abnormalities. Soursop plant as a medicinal plants is known to have an antioxidant effect and nowadays is used as an alternative drug for hepatitis. One of the methods to assess liver function is to measure the serum Glutamate Piruvate Transaminase (SGPT) level. The purpose of this study was to find the effect of Soursop Leaf in inhibiting the SGPT elevation .

Methods: An experimental study was conducted on 25 white male rats of wistar strain in the pharmacology laboratory of Faculty of Medicine, Universitas Padjadjaran during the period of September to October 2012. The rats were divided into 5 groups (group 1 and 2 as control; group 3, 4, and 5 as treatment groups treated by 200, 400, 600 mg/kgbw soursop extract, respectively). The soursop extract was administered to the treatment groups for 8 days. On the 8th day, group 2, 3, 4, and 5 received 1.6 ml CCl₄10% intraperitoneally. After 18 hours, the mean SGPT levels from all groups were measured. ANOVA test was used to analyze the result.

Results : The mean SGPT levels were lower in the 3rd, 4th, and 5th group compared to group 2. There was a significant difference among treatment groups. Group 3 had the most significant result.

Conclusion: Soursop leaf inhibits the elevation of SGPT level.

Keywords: Hepatitis, SGPT, soursop leaf (*Annona muricata*)

Introduction

Liver is the largest gland in the body, the weight average is 1500 gram in adults. Liver has a main function as a filter for blood.¹ The blood circulating the body will be cleansed and filtered from toxins that enter the body through food or respiration.^{1,2,3} Other hepatic functions are storing many forms of glucose, vit B12, and iron, energy provider (sugar) and protein, hormone secretion, insulin secretion, lipid and cholesterol forming and excretion.^{1,2} Liver also functions in detoxification as a filter and excretor of toxins in blood through hemoglobin dismantling, and processing ammonia into urea.² One of the methods to assess liver function is to measure the serum level of glutamate piruvate transaminase (SGPT). Hepatitis is an infection or inflammation disease of the liver which is caused by virus, toxic substance, and immunological abnormalities.⁴

Indonesia has many traditional medicines and medicinal plants. Medicinal plants as herbal medicine is developing, aside from being relatively affordable, herbal raw materials are also easy to obtain and grow in the environment, and do not has any adverse effects known to man.⁵ Herbal medicines are known to work as anti-oxidant, anti-inflammatory, analgesic, etc.⁶ This is related to the fitochemical substances contained in medicinal plants.^{3,7-9}

Anti-oxidant is substance which functions to protect the body from free radicals. Some examples of anti-oxidant are vitamins, poliphenol, karotin, and minerals. Naturally, these substances have a significant role to prevent diseases. Anti-oxidant prevents diseases by suppressing the damage on cells due to oxidation of free radicals.^{3,7,8} Free radicals have unpaired electrons which are not stable and will try to find electron pairings. Environmental activities that can produce free

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radicals are as follows: radiation, pollution, etc. Free radicals which circulate the body will try to find electron pairings with other molecules such as Deoxyribo Nucleatid Acid (DNA) and cells. If electron pairing is succesful, it will disrupt the cells and DNA.¹⁰ Anti-oxidant helps to inhibit this process by donating an electron to free radicals. Anti-oxidants will neutralize the free radicals as such that they do not try to find electron from cells and DNA.^{3,7,8}

One of the substances that can produce free radicals is Carbon Tetrachloride (CCl₄). The liver produces CCl₄ into the free radical CCl₃, which then oxidizes the unsaturated fatty acid in phospholipid layers of cellular or organel membranes, so then damages hepatic cells and can induce necrosis. The CCl₄ is regarded as a hepatotoxin.¹¹

Liver cell damage can be inhibited by many hepatoprotector substances which are chemicals that can protect the liver cells.¹² One of the easily obtained anti-oxidants is from soursop leaf.¹² Soursop plant is one of the vegetations functioning for health.⁸ In each region in Indonesia, soursop plants have many different uses for diseases and are known used as an alternative drug for hepatitis and other diseases such as asthma, bronchitis, diabetes mellitus, etc.^{5,8,13} Soursop have many useful substances such as the flavonoids and ascorbic acid in the leaves which are known to have anti-oxidant properties.^{3,6,7} According to the background stated above, this study aims to know the effect of soursop leaf extract (Annona muricata) on hepatitis model rats which are induced by CCl₄.^{9,10,14,15}

Methods

An experimental study conducted on 25 white male rats of wistar strain which were healthy, aged 2–3 months old with weight between

200–300 grams. This study was carried out in Pharmacology Laboratory of Faculty of Medicine Universitas Padjadjaran during the period from September to October 2012.

Preparation of Soursop Leaf Ethanol Extract (SLEE) was conducted through several steps as follows: 1) Fresh soursop leaves were washed and dried by exposure to direct sunlight or indirectly through a black fabric, 2) The leaves were grinded and extracted using ethanol 70%(maseration method), 3) The extract liquid was evaporized until a viscous extract was obtained.

The rats were divided into 5 groups (group 1 and 2 as control groups, group 3, 4, and 5 as treatment groups, were given each 200, 400, 600 mg/kgbw soursop extract). Soursop extract was then administered to the treatment groups for 8 days.

On the 8th day, group 2, 3, 4, and 5 were administrated 1.6 ml CCl₄10% intraperitoneally. The damage caused by CCl₄ which is a hepatitis causing free radical is by increasing calcium influx from the swelling of smooth and rough endoplasmic reticulum. Due to this calcium influx, the SGPT in cytosol rose in rats belong to groups II – V which were induced with hepatitis by injection of CCl₄ 10% 1.6 mL per intra peritoneal (IP) in the abdomen.

After 18 hours, mean SGPT levels from all groups ware measured. A Shapiro test ($p \geq 0.05$) was carried out and the data results were not normally distributed. In the relation in that results, data transformation was carried out. ANOVA test was used to analyze the result.

Results

After each treatment with soursop leaf extract, the mean SGPT level is lower in the 3rd, 4th, and 5th group compared to group

Table 1 SGPT Level of each Treatment after Administration of Soursop Leaf Extract

Group	n	Mean Level SGPT	SD
		(x 10 ³ IU/L)	
Group 1	5	0.060	0.017
Group 2	5	18.246	1.174
Group 3	5	7.636	0.634
Group 4	5	11.334	1.871
Group 5	5	13.950	1.029

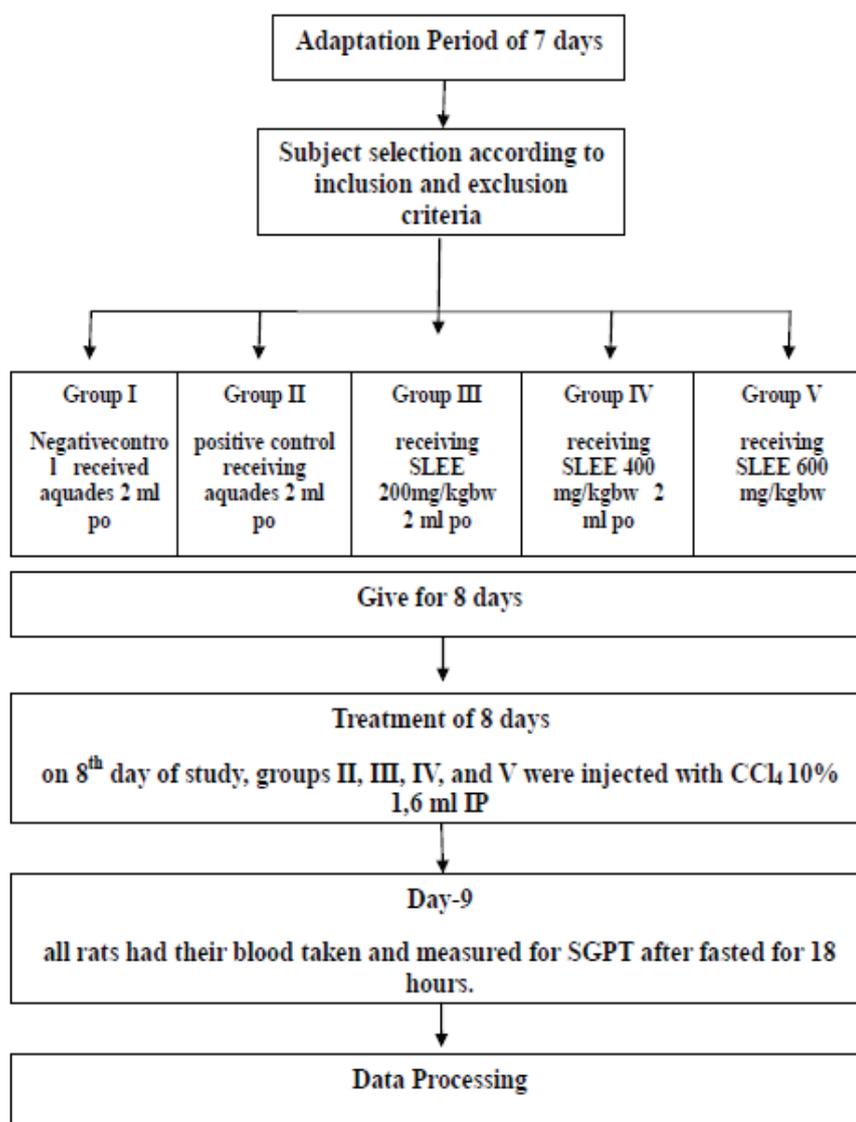


Figure 1 Procedure

II. There was a significant difference ($p < 0.05$) between treatment groups, in which the F value was 492.419 and had $p < 0.05$ (Table 1).

The SGPT level was recorded to continuously rise in group II. This is due to these rats that were not treated with SLEE as positive control. Group III had the most significant result on inhibiting the rise of SGPT on CCl_4 induced rats with an inhibiting value of 10.609×10^3 IU/L or 58.34%.

Discussion

According to a study from Ghana¹⁶ stated

that the study conducted with rats treated with soursop leaf extract with dose of 50 mg/kgbw, 100 mg/kgbw, 200 mg/kgbw, and 400 mg/kgbw, showed that the smallest dose of 50 mg/kgbw have the highest effectiveness. Meanwhile, the study that was conducted by the researcher in the smallest dose of 200 mg/kgbw has the highest effectiveness.

Soursop leaf extract contains acetogenins which functions as free radical scavenger (anti-oxidant) and are effective as anti-tumor agents. Anti-oxidant is substance that works to protect the cells from the effect of free radicals. However, *Annona muricata* Linn also contains ascorbic acid which have anti-oxidant

effect in the body.^{3,8}

This study concluded that Soursop Leaf Ethanol Extract have inhibiting effect of elevating the Serum Glutamat Piruvat Transaminase level in rats.

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