Effectiveness of Administration Extract Haramounting Leaf (*Rhodomyrtus tomentosa* (Aiton) Hassk) as Antioxidant in Preventing Special Liver Values SGOT/SGPT Mice (*Mus musculus* L.) after Exposure of Electric Cigarette Smoke

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Abstract: This study aims to determine how the effectiveness of the Haramonting extract (*Rhodomyrtus tomentosa* (Aiton) Haask.) can provide a protective effect on the function liver sgpt sgot mice (Mus musculus L.) exposed to cigarette smoke for 30 days at a dose of 100 mg / BB, 200 mg / BB and 300 mg / BB. The design of this study used Completely Randomized Design (CRD) consisting of Group +, Group - and three treatments of Extract Haramounting Leaf (*Rhodomytrus tomentosa* (Aiton) Hassk.) And five replications.. Result observations of liver and liver function SGPT SGOT showed that there were no significant differences ($p > 0.05$) between the average number of damaged cells and liver function of SGPT SGOT in male mice given Ethanol Leaf extract of Haramounting (*Rhodomytrus tomentosa* (Aiton) Hassk.) And exposed to electric cigarette smoke.

1 INTRODUCTION

One billion men in the world are smokers, 35% of them are from developed countries and 50% are from developing countries. On average 435,000 people in the United States die from diseases related to smoking habits each year, causing 1 in 5 deaths. Based on data from the Asean Tobacco Control Report Card in 2008, as many as 30.1% of the population of Southeast Asia are smokers. In Indonesia as many as 57,563,866 adult residents are smokers, making it the fifth highest cigarette consumer country in the world (Rahmadi, 2013)

Cigarettes are one of the pollutants in the form of gases that contain various chemicals including nicotine, carbon monoxide, tar and eugenol (in clove cigarettes). Cigarette smoke can affect macrophage metabolism by activating macrophages to release leukotriene B4, IL-8 and TNF-α causing increased production of superoxide (O^{2-}) and H_2O_2, also causing oxidative damage to macromolecules such as lipids, proteins, and DNA, can eliminate antioxidants, and form free radicals such as nitric oxide (NO), nitrite peroxide (NO_2) in the gas phase and quinone (Q), semiquinone (HQ) and hydroquinone (HQ_2) in the tar phase (Soesilo, 2012).

Free radicals are molecular atoms that are very unstable (have one or more electrons without a pair), so to obtain electron pairs these compounds are very reactive and damage the tissue. Free radicals can come from various chemicals, one of them is Aloksan. Alloxan is a cyclic derivative of urea which is a potential agent that has been widely used to cause type I diabetes at a dose of 150 mg / kg (Mangkowedjo, 1988)

The chemicals used to prevent or slow down free radical damage are antioxidants. These endogenous antioxidants work to neutralize free radicals which, in the process, require exogenous antioxidants in the form of vitamins and minerals that can be obtained from food or supplements.

Kemunting or Haramounting (Rhodomyrtus tomentosa (Aiton) Hassk.) Is a native of Southeast Asia and is spread over Indonesia. Spring leaves contain steroids, terpenoid, alkaloids, phenols, flavonoids, and saponins (Getta, 2010). According to

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research conducted in vivo and in vitro (Lanaya, 2012). In 2012, the acetone extract of kemunting leaf has a strong antioxidant activity. Based on the above description, this study was conducted to determine the effect of haramonting leaf extract (Rhodomyrtus tomentosa (Aiton) Hassk.) against the prevention of damage to liver mice (Mus musculus L.) after exposure to electric cigarette smoke.

2 METHODS

2.1 Research Design

This study used the Completely Randomized Design Method which was divided into 6 treatments with 4 replications in accordance with the Fereder formula:

$$(t-1)(n-1) \geq 15 \quad (1)$$

Description:

t = treatment group

n = repeat

The following treatment groupings can be seen in table 1.

Table 1. Grouping of research treatments

Treatment	Aquadest	Smoke Electric	Haramounting Exract 45 Days		
			100mg Kg/BB	200mg Kg/BB	300 mg Kg/BB
K (-)	√				
K (+)	√	√			
P1		√	√		
P2		√		√	
P3		√			√

2.2 Sample Preparation and Preparation of Extracts

Extraction method used is maceration with ethanol solvent. Preparation of the extract was done by immersing the simplicia for 48 hours with the composition of 500 grams of haramounting leaves in 50% ethanol and shaken periodically. Then filtered using Whatmann paper and evaporated to separate the solvent with the extraction results at a temperature of 18-32 ° C.

2.3 An Experimental Council

Mice (*Mus musculus*) male DDW strain, healthy, fertil and age 8-11 weeks with weight 25-30 g, healthy, fertil (never give birth child once) as much as 30 ekor.mice from Animal Disease Investigation Center North Sumatra Medan and divided in treatment and control groups. The mice were fed and drunk in adlibitum, the cage was clean and arranged 12 light hours - 12 hours of darkness. Handling of mice in accordance with animal ethics code of try (Ethical clearance of Animal Research Commission of FMIPA USU).

2.4 Exposure of Cigarette Smoke and Extract Giving

Testing mice were fed pellets and drank in ad libitum, then given oral haramounting extract orally with doses of 100 mg / kgBW and 200 mg / kgBW each distinguished into two durations of 28 days and 45 days. On Mice Data Larasati (2010) study results illustrate that exposure to smoke per cigarette every day for 14 days has caused mild to severe lung organ damage. Therefore, in this research the exposure of secondhand smoke in group II, III and IV mice was done every day for 30 days according to Widodo procedure (2006). Provision of cigarette smoke is done with a dose of 1 stalk per group every morning after 1 hour of haramounting extract. Stages of exposure to cigarette smoke is done by first preparing the equipment used in the exposure of the smoking pump coupled with a smoking chamber. Smoking chamber has two holes, one hole on the side to be connected with the pump and the other one in front is used as ventilation / enables air exchange. Five mice from each group were inserted into the smoking

Chamber through the top of the smoking chamber, then closed again. One cigarette was placed in a pipe connected to the pump. Cigarettes that have been installed on the next pump An electric cigarette is mounted on the end of the hose so that cigarette smoke into the smoking chamber. Stopwatch / timer is installed to determine the time spent to spend a single stick of clove cigarettes. Smoking chamber will be filled with cigarette smoke during the exposure of cigarette smoke and the behavior of mice can be observed in the smoking chamber. Every before giving cigarette smoke and harumonting extracts, the mice are empowered ± 5 hours to empty the stomach. Giving of cigarette smoke is done ± 1 hour after giving honey to absorbed honey first.

2.5 Liver Function Analysis based on SGPT / SGOT Levels

Mice blood is centrifuged at 3000rpm for 10 minutes until serum is obtained. First the clean tube is provided for the blank tube, the control tube and the sample tube as the amount, and the blank tube inserted into the microlab 300 spectrophotometer device is directly read, as well as the control tube and then inserted the SGPT work reagent of 1.000µ / L and then read on the spectrophotometer microlab 300, in the sample tube inserted 100µ / L serum into the sample tube and added SGPT working reagent as much as 1,000µ / L, then read on microlab 300 spectrophotometer and recorded the results (Subrata, 1988)

2.6 Data Analysis

The data analysis used a complete randomized design (ANOVA) complete randomized design (RAL) at 95% confidence level, $\alpha = 0.5$ with bootstrap analysis. All data is analyzed using SPSS 22 program.

3 RESULTS AND DISCUSSION

3.1 Extract Activity Value SGOT

Based on observations from the SGOT test results that have been done on the hearts of male mice after the exposure of electric cigarette smoke and given Haramounting ethanol extract (Rhomodytrus tomentosa (Aiton) Hask.) Results obtained in Figure 1

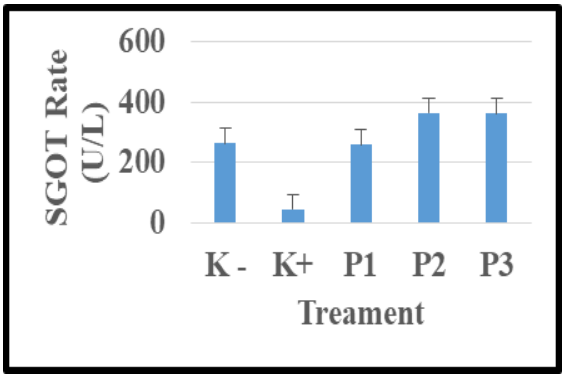

Figure 1 The value SGOT of all treatments has significant difference. K (+): Smoke Smoke Exposure. K (-): aquades. P1: Smoke Smoke Exposure and haramonting leaf extract 100 mg / kgBB for 45 days. P2: Cigarette Smoke Exposure and haramonting leaf extract 200 mg / kgBB for 45 days. P3: Cigarette Smoke Exposure and haramonting leaf extract 300 mg / kgBB for 28 days.

Based Figure 1 an indicates the average value of SGOT K-: 276.48; K +: 48,18; P1: 309,62; P2: 436,08; and P3: 388.80. In the P2 group (after being exposed to electric cigarette smoke and dose extract of 200mg / Kg BB for 45 days) the value was higher than among other treatment groups. This may occur due to the exposure of electric cigarette smoke and the provision of haramounting extract given can increase the SGOT value where the SGOT value is increased due to impaired liver function, but after testing using ANOVA test between all control groups with treatment groups did not show significant differences ($p > 0.05$).

In Figure 1 shows the average increase in SGOT value in the liver of mice after the exposure of electric cigarette smoke and given Haramounting ethanol extract (*Rhomodytrus tomentosa* (Aiton) Hask.) The results obtained were no significant differences in SGOT values ($p > 0.05$) in each group both in the control group and the treatment group. In the treatment group, in group P2 (after being exposed to electric cigarette smoke and extract dose of 200mg / Kg BB for 45 days), it was higher than the control group, this was due to the effect of haramounting ethanol extract and exposed to cigarette smoke capable of increasing the SGOT value.

The liver is an organ that is sensitive to toxic substances and has an important role in the metabolism of toxic substances that function as detoxification. Substances absorbed through the gastrointestinal tract will be carried through the bloodstream to the liver in the detoxification process so that it becomes non-toxic and then excreted. Then liver cells will release enzymes where the enzyme level can be used as a parameter of the damage to liver cells (Aferlina, 2010)

One indicator of damage to liver cells is an increase in serum liver enzymes, including increased levels of SGOT (Serum Glutamic Pyruvic Transamine), an aminotransferase enzyme that acts in the serum to measure indications of liver diseases. (Wahyuni, 2005)

3.2 Extract Activity Value SGPT

Based on observations from the SGOT test results that have been done on the hearts of male mice after the exposure of electric cigarette smoke and given Haramounting ethanol extract (*Rhomodytrus tomentosa* (Aiton) Hask.) Results obtained in Figure 2

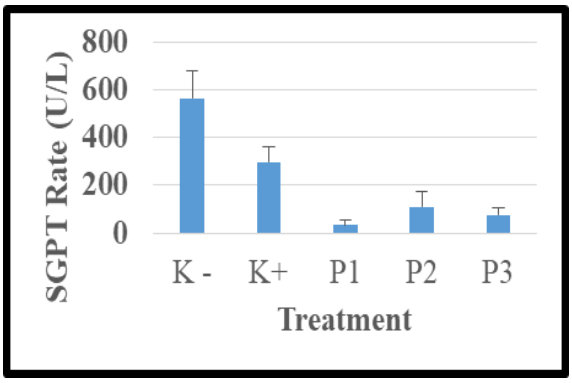

Figure 2 The value SGPT of all treatments has significant difference. K (+): Smoke Smoke Exposure. K (-): aquades. P1: Smoke Smoke Exposure and haramonting leaf extract 100 mg / kgBB for 45 days. P2: Cigarette Smoke Exposure and haramonting leaf extract 200 mg / kgBB for 45 days. P3: Cigarette Smoke Exposure and haramonting leaf extract 300 mg / kgBB for 28 days.

Based Figure 2 an indicating the average value of SGOT K-: 575,6; K +: 313,35; P1: 40,86; P2: 131,46; and P3: 81.46. In the K-group (not given anything) the value was higher than in other groups. This may occur due to the exposure of electric cigarette smoke and the provision of haramounting extract given can increase the SGPT value where the SGOT value is increased due to impaired liver function, but after testing using the ANOVA test between all control groups with the treatment group show significant differences ($p<0.05$). In the K-group (not given anything), it can be higher than the control group, this is because the effect of ethanol extracting ethanol and electromagnetic smoke is able to increase the SGPT value. And from the results obtained from the statistical tests conducted, there were no significant differences in SGPT values ($p <0.05$) in each group. Both the control group and the treatment group. In the K-group (not given anything) it can be higher than the treatment group. However, in the treatment of P1, P2 and P3 it decreased the SGPT value due to the exposure of cigarette smoke and haramounting extract can reduce the SGPT value.

The results obtained were the significant differences in SGPT values ($p <0.05$) in each group in both the control and treatment groups. In the K-group (not given anything), it can be higher than the control group, this is because the effect of ethanol extracting ethanol and electromagnetic smoke is able to increase the SGPT value. And from the results obtained from the statistical tests conducted, there were significant differences in SGPT values ($p <0.05$) in each group. Both the control group and the treatment group. In the K-group (not given anything) it can be higher than the treatment group. However, in the treatment of P1, P2 and P3 lowering the SGPT value this is due to the exposure of cigarette smoke and haramounting extract can reduce the SGPT value and also there are several factors that make a high negative control value that is the method of blood collection, blood serum amount obtained and blood serum storage time before being examined, it is also possible to administer adbilitum foods and factors that cannot be controlled by the researchers themselves and may also process metabolic disorders in the liver.

This is in line (Istikomah, 2015) Liver cells are damaged, the SGPT will be released in the blood. In case of mitochondrial damage or damage to cell parenchyma, SGPT is seen to increase. It is suspected that not all increases in SGPT levels are due to liver cell disorders. SGPT levels depend on the method of taking blood, the amount of blood serum obtained and the duration of blood serum storage before being examined.

However, according to the results (Fajariyah, 2010), the high SGOT-SGPT level as a liver function test / test is not always characterized by high hepatocyte damage because it depends on the extent, type of liver damage, sensitivity of the test method and whether there is a compensatory effort by liver cells healthy. Often there is no relationship between high enzyme levels and the degree of damage to hepatocytes and the increase in SGPT enzymes can identify damage to liver cells, this enzyme will increase faster when the liver cells experience disturbance or damage. Increased serum transamine levels caused by transamine-rich cells experience necrosis or destruction. Similarly, SGPT (Serum Glutamic Pyruvate Transamine) is a transaminase enzyme that is widely found in the cytosol. This enzyme level will exceed normal levels in the blood if there is damage to membrane permeability caused by toxic substances. (Fathir, 2010)

4 CONCLUSIONS

The spread of electric cigarette smoke and the provision of haramounting leaf extract haramounting (*Rhomodytrus tomentosa* (Aiton) Hask.) with a dose of 100 mg / bb can reduce the SGPT value. While the SGOT value shows the increase in value. And still passing away does not damage the liver and is likely to be a drug

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