Subchronic effect of ethanol extract of jaloh bark to SGOT and SGPT level in serum and liver histopathology of white rat

R. Sumarny a, Sugito b, Ruri N a

aFaculty of Pharmacy, University of Pancasila, Jakarta, Indonesia
bFaculty of Veterinary Medicine, University of Syiah Kuala, Banda-Aceh, Indonesia

ABSTRACT

Objectives: To observe the using of ethanol extract jaloh bark (EEJB) in the function and histopathologic changes of liver male white rats

Methods: The rats were divided to 4 groups (each group composed of 18 rats). The first group was given CMC NA 0.5% orally every day for 2 and 4 week. The second, third, and fourth group were given 31.5, 63, and 126 mg/kg BW of EEJB, respectively. In the week of 2, 4, and 6 blood was taken to analyze liver function and the rats were autopsied in order to get liver histopathologic assessment preparation. At every week sampling period, each group consisted of 6 repeats. Liver function parameter observed was level of SGOT and SGPT in serum and histopathologic changes of liver.

Results: EEJB was not influenced the function of liver and no histopathologic changes were occurred in liver tissues.

Conclusions: The dose of EEJB of 31.5, 63, and 126 mg/kg BW for 2 and 4 week can be applied and cause no toxic.

Key words: ethanol extract jaloh bark, SGOT, SGPT, liver histopathology

INTRODUCTION

Salix sp plant has been used widely amount community, particulary in European and Asian countries as a medical substance for rheumatic disease, pain killer and backache (Fiebich dan Chrubasik 2004). Furthermore, it has been known that in Nanggro Aceh Darussalam, there is a plant commonly used as traditional medicine. Acehnese people call it jaloh which is one of species from salicaceae family. This plant is use by people to relieve fever and it is used as well for animal especially lean animal with less appetite during summer (Khalid, 1996). Based on the result of analysis, some species of Salix (i.e. Salix alba; S. daphnoides, S. purpurea, S. matsudana) contain glycoside compound like salicin. In addition, some terpene compound, flavonoid and steroids have been identified (Du et al. 2004; Kammerer et al. 2005).
Due to its empirical and continuous use as rheumatic medicine, it is necessary to undergo toxicity test, in particular subchronic toxicity test. Toxicity test should be done to medicinal plant in order to verify its safety. One of safety parameters of medicinal plant use is through observation to liver organ. This organ is observe chemically to determine SGOT and SGPT level and it is then observe microscopically to find out the change occurred in hepatic cells.

METHODOLOGY

Material

Materials used in this research consisted of ethanol extract of jaloh bark (Salix tetrasperma Roxb) from phytochemistry laboratorium, Biological Research Center, LIPI, Bogor; aquadest, sodium CMC, Bouin solution (saturated picric acid, Formaldehyde 40%, glacial acetic acid), alcohol, Kitt reagent (ST-reagent) to determine SGOT and SGPT level, paraffin, ether.

Procedure

1. Preparation of Experimental Animal

   Animal use in this experiment were 72 male white rat Sprague Dawley (age 3 months old and weight 180-200 g). This animals were classified into 4 groups, where each group consisted of 18 rats. The animal were then treated with 3 observation (week 2, 4 and 6) and each observation involve 6 rats.

2. Dose Determination

   The dose was 350 mg/kg of human body weight with 3 dose level where each level was multiplied 2 times. After that, the dose was converted from human to rat (0.018). Therefore, the dose given was 350mgx0.018=6.3mg/200g rat body weight =31.5mg/kgBW

3. Treatment of experimental animal

   The rats were adjusted with environment for 2 weeks. The animals were randomly classified into 4 groups (18 animals/group). Group I as a control group were given sodium CMC 0.5%, while group II, III and IV, were given the ethanol extract suspension of jaloh bark with dose 31.5mg/kgBW, 63/kgBW dan 126mg/kgBW respectively. Each group was divided into 3 observation periods (week 2, 4 and 6) where each observation used 6 rats. Each animal from each group was fed orally with ethanol extract of Salix tetrasperma.

   The blood rats was taken by using syringe needle from heart and the blood was collected in Ependorf tube. The blood was centrifuged and serum was taken to analyze SGOT and SGPT level. The histology from liver organ was made by using hematoxylin-eosin stain-
ning, and then the weight of the organ was measure and the ratio was calculated compare to the rat’s body weight.

RESULT AND DISCUSSION

Toxicity test is very important to determine the safety of using medicinal plant. One of the toxicity tests is short-term toxicity test or subchronic toxicity test. Subchronic toxicity is done if it is used clinically by human continuously within 1-4 weeks. This test take 4 weeks-3 months (WHO, 2000). There were 3 dose levels used in subchronic toxicity test, namely the first dose was high dose that can cause the emergence of toxicity signs but this dose was not high enough to kill the majority of the animal. The second dose was expected not to result in toxicity effect at all and the third dose was moderate dose. In addition to the previous doses, one dose was added as control dose to ensure that the aim stated before can be reached. (LU, 1995)

The result from the ratio of liver organ weight to rat body weight based on one ways variance analysis to dose variable revealed that there was no significant difference in each dose level. However in terms of sampling time variable, the control group showed no difference seen in week 2, 4 and 6, and in the treatment group with 3 dose level (31.5, 63 dan 126 mg/kg BW) showed significant difference where there was an increase of ratio of liver organ weight/rat body weight in week 4 and 6 compare to week 2. This difference was due to the increase of body weight and the increase of liver organ weight in week 4 and 6 (Figure 1).

The chemical analysis of rat blood using one way variance analysis showed that there was no significant difference of SGOT and SGPT level for control group and all treatment groups with three dose level in terms of either dose variable or sampling time variable (Figure 2 and 3). The observation of liver organ showed that there was no change of liver size and shape. The histopathology picture looked normal (figure 4)

![Figure 1. Graph of Ratio Liver Weight/Rat Body Weight](image-url)
Figure 2. SGOT Level Graph

Figure 3. SGPT Level Graph

Figure 4. The Picture of Liver Histopathology in Week 4 in Group I (Sodium CMC), II (Dose 31.5mg/kgBW), III (Dose 63mg/kg BW), IV (Dose 126mg/kg BW)
CONCLUSION

Based on the result from the liver organ showed that the used of ethanol extract of jaloh bark with dose 31.5, 63 and 126 mg/kg BW for 4 weeks did not influence the function parameter and histopathology picture of liver organ rats. Thus it could be said that this extract was save and non toxic to liver organ.

REFERENCE


