Oral Presentation (PCS-3)

Toxicity Sub-cronic Ethanolic Extract of Malaka (Phyllanthus emblica) Leaves on Kidney Function of Mice (Mus musculus) be Reviewed from Blood Creatinin Level

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INTRODUCTION

Herbal medicine is still the mainstay of about 75-80% of the whole population, and the major part of traditional therapy involves the use of plant extract and their active constituents in the indigenous. The plant genus Phyllantus is widely distributed in most of tropical and subtropical countries like China, India, Southeast Asia and Indonesia [1,2]. Phyllantus spesies have long been used in folk medicine to tread a broad spectrum of disorders. *Phyllantus emblica* or Indian gooseberry (Figure 1), belonging to family Euphorbeaceae has been reported to have antioxidant, anti-inflammatory, anticancer, adaptogenic, anti-diabetic, antimicrobial and immunomodulatory potential [3]. The aim of the study was to investigate the effect of ethanolic extract of malaka leaves (*Phyllanthus emblica*) on renal function by analyzing creatinine level in mice blood (*Mus musculus*).

MATERIALS AND METHODS

Plant Collection

The fresh mature healthy leaves of *Phyllanthus emblica* were collected during the month of April from Aceh Besar. The plants were then identified at MIPA UNSYIAH.

The dried leaves were then grinded into a fine powder in a mixer and the powder was keep in clean polythene bags.

Preparation of Plant Extract with Ethanol

A total of 500 grams of leaf powder was added with 3000 ml of Ethanol, stirred it constantly for 30 minutes and the solution was kept at room temperature for 72 hours then filtered. The filtered solution leaf were refiltered with Whatman paper No.3 then store at 4 degrees centigrade (in a freezer) until use.

This study was an experimental study using a complete randomized analysis (RAL). Sixteen male mice weighing between 25-30 g were used in this study. Group I (P0) as negative control, group II (P1) given ethanol extract of malacca leaves at dose of 300 mg/kg bb, group III (P2) ethanol extract of malacca leaves at dose 600 mg / kg bb, and group IV (P3) ethanol extract of leaves of malaka with dose of 1200 mg / kg bb [4].

Mice were randomly divided into 4 groups of 4 mice each. Control group (P0) was given distilled water, group P1, P2, P3 were administered ethanolic extract of malaka leaves with the dosage of 300 mg/kg bb, 600 mg/kg bb, and 1200 mg/kg bb respectively. Blood sample was taken on the 21st day after treatment for measuring creatinine levels of mice. The result showed that creatinine level of mice blood in P0, P1, P2, and P3 were 0.9; 1.025; 1.075, and 0.95 mg/dl respectively. Ethanolic extract of malaka leaves was given by oral once a day for 21 days. Then collect serum used for the analysis of creatinine levels. Measurement of creatinine levels using a spectrophotometer at a wavelength of 505 nm.

Data Analysis

The result of One Way Analysis of Variance test showed that blood creatinin level of mice between the control group and the treatment group was not significantly different (P>0.05).

RESULT AND DISCUSSION

Creatinine is a by-product of normal muscle contraction, in which creatinine is made up of creatine which is the energy supplier to muscles. These waste products are usually removed from the blood through the kidneys, but when the kidney function slows down, the creatinine level will increase. If there is impaired filtration function in the kidneys, then the level of creatinine in the blood will increase [5]. The results of the effect of ethanol extract of malacca leaves on creatinine levels of mice blood given orally for 21 days can be seen in Table 1.

Table 1. Mean ± SD creatinin mice blood

Kelompok	(mg/dl) ± SD
P0	0,9 ± 0,45
P1	1,025 ± 0,51
P2	1,075 ± 0,54
P3	0,95 ± 0,47

Based on Table 1 it can be seen that blood creatinine levels of mice given ethanol extract of leaves of malaka for 21 days in group P1 and P2 increased compared to group P0 whereas in group P3 was decreased, where blood creatinin levels between groups were still within normal range. In accordance with the statement of Loeb 1989 which disitasi by [6] that the normal creatinine levels of mice ranged from 0.48-1.1 mg/dl. The result of anava test showed that the creatinine level of mice blood between groups was not significantly different (P>0.05).

The doses used in this study were doses of 300, 600, and 1200 mg / kg bb. The choice of dose was due to the sub-acute toxicity test at least three dose groups consisting of the largest dose ie the dose expected to have toxic effect, the middle dose is the dose that gives the activity, and the smallest dose ie the dose is not expected to give effect. The dose and number of dose groups should be sufficient so that toxic doses and doses are not toxic [7,8], states that the duration and intensity of exposure to toxic substances can also affect the form and the toxicity of a particular material. Various biochemical responses may initially be adaptive, if sustained will lead to pathological changes or pathological disorders.

CONCLUSION

The administration of ethanolic extract of malaka leaves with repeated doses for 21 days does not have negative effect on the kidneys of mice.

REFERENCE

[1] Perianayagam J, Narayanan S, Gnanasekar G, Pandurangan A, Raja S, Rajagopal K, Rajesh R, Vijayarajkumar P, Vijayakumar S. 2005. Evaluation of antidiarrheal potential of *Emblica officinalis*, *Pharm Biol* 43(4):373-377.

[2] Barthakur NN, Arnold NP. 1991. Chemical analysis of the emblic (*Phyllanthus emblica* L.) and its potential as a food source. *Sci Hort* 47(1–2):99-105.

[3] Mirunalini S, Krishnaveni M. 2010. Therapeutic potential of *Phyllanthus emblica* (amla): the ayurvedic wonder. *J Basic Clin Physiol Pharmacol*. 21(1):93-105.

[4] Jaijoy K, Soonthornchareonnon N, Lertprasertsuke N, Panthong A, Sireeratawong S. 2010. Acute and chronic oral toxicity of standardized water extract from fruit of *Phyllanthus emblica* Linn. *Int. J. of Appl. Res. in Natural Products.* 3(1): 48-58.

[5] Handajani NS, Dharmawan R. 2009. Pengaruh VCO terhadap Hitung Jenis Leukosit, Kadar Glukosa dan Kreatinin Darah *Mus musculus Balb/c* Hiperglikemi dan Tersensitisasi Ovalbumin. *Artikel Ilmiah*. Surakarta (ID): Universitas Sebelas Maret.

[6] Doloksaribu B. 2008. Pengaruh proteksi vitamin C terhadap kadar ureum, kreatinin, dan gambaran histopatologis ginjal mencit yang dipapar plumbum [tesis]. Medan (ID): Universitas Sumatra Utara.

[7] Priyanto. 2010. *Toksisitas Mekanisme Terapi Antidotum dan Penilaian Resiko*. Depok (ID): Penerbit Lembaga Studi dan Konsultasi Farmakologi Indonesia.

[8] Donatus AI. 2001. *Toksikologi Dasar*. Yogyakarta (ID): Universitas Gadjah Mada.