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Testing the Antihyperurisemic Effectiveness of the Ethanol Extract of Henna Leaf (*Lawsonia Mermis* L.) on Induced Male Mice (*Mus Musculus*) with Chicken Liver and Potassium Bromate

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ABSTRACT

Hyperuricemia is a condition that is marked by an increase in blood pressure in the blood that exceeds the normal level, ie above 7.0 mg/dl in the patient and above 6.0 mg/dl in women. It is generally intended to address hyperuricemia in the use of synthesized drugs that can give rise to the effect of retinal pain, vomiting, diarrhea, damage to the liver, nephritis in the brain and hypertheritivity. By therefore developing alternative treatments using plant medicine as well as parsley nails (*Lawson mermis* L.). This research is aimed at identifying extracurricular nephew nails (EEDPK) against decreasing levels of pregnancy in males who are induced by liver cancer and galleria. This research uses experimental methods with gathering and processing materials, identification of growth, making implicit, making extracts, determining water levels, preparing animal trials, and testing EEDPK effects. Animals used 24 eggs were divided into 6 groups of tests, group divisions included normal groups, induction, comparison, and EEDPK in 3 doses of 150 mg/kg body weight, 300 mg/kg body weight, and EEDPK 600 mg/kg body weight *version 25* with 95% confidence level. The results of the EEDPK water level assessment were 3.33%. The results of the efficacy of hyperuricides will be shown that EEDPK provides the effect of the most effective extracts as antihyperuricemia is 300 mg/kgBB compared to other groups of extract.

Keywords: *Antihyperuricemia, Henna Leaf (Lawson mermis L.), Heat Chicken, Potassium Bromat*

1. INTRODUCTION

Hyperuricemia is a condition characterized by an increase in uric acid levels in the blood that exceed the normal limit, namely above 7.0 mg/dl in men and above 6.0 mg/dl in women. Under normal circumstances, uric acid has a very good function for the body, namely as an anti-oxidant. Hyperuricemia can occur due to excessive uric acid production, reduced uric acid excretion, or a combination of both. Efforts to reduce blood uric acid levels can be done by reducing uric acid production or increasing uric acid excretion by the kidneys [1]. Increased uric acid levels can be influenced by age, gender, body weight, consumption of foods high in purine, alcohol consumption, use of certain medications, impaired kidney function, types of food that contain high purine, such as offal (liver, kidney and lungs), Shrimp, crab, spinach and melinjo are among the types of food most popular with Indonesian people [2].

Treatment of hyperuricemia generally uses synthetic drugs such as allopurinol. Allopurinol is an example of a drug that works to inhibit the formation of uric acid by inhibiting the activity of the xanthine oxidase enzyme. The xanthine oxidase enzyme will convert hypoxanthine into xanthine and then convert it into uric acid. The use of allopurinol has side effects such as nausea, vomiting, diarrhea, liver damage, interstitial nephritis and hypersensitivity. Seeing the side effects obtained, gout treatment using natural methods can also be done, namely by using the henna leaf (*Lawsonia mermis* L.), the use of henna leaf as a natural medicine, both as medicine and for other purposes tends to increase, the use of traditional medicines and Medicinal plants are widely used in promotional efforts [3].

Henna leaf (*Lawsonia mermis* L.) contain active compounds such as alkaloids, glycosides, flavonoids, phenols, quinones, steroids, saponins, tannins and essential oils. The henna leaf (*Lawsonia mermis* L.) contains many chemical compounds that can be used as medicinal ingredients. Research conducted by Nagao, Seki and Kobayashi (1999) [4],

regarding the inhibitory power of xanthine oxidase stated that the active secondary metabolites that can act as xanthine oxidase inhibitors are flavonoids, one example is the compound luteolin from the flavone class, these results were later confirmed with the results of research conducted by Van Hoorn et al, (2002) [5], where results were obtained from various types of flavonoids and one of them was luteolin which could inhibit xanthine oxidase activity [6]. Based on the description above, researchers are interested in testing the effect of reducing blood uric acid levels in mice (*Mus musculus*) by administering ethanol extract of henna leaf (*Lawsonia mermis* L.) with the aim of utilizing and developing henna (*Lawsonia mermis* L.) leaves as a an alternative gout medicine that comes from natural ingredients for the community [7].

2. METHOD

The research was carried out using laboratory experimental methods, using a research design in the form of an ANOVA test. The total number of samples used in the research was 1 sample; were randomly grouped into 6 groups, each group consisting of 5 male mice and treated orally. Results: Identification of the type of henna leaf, namely *Lawsonia mermis* L. obtained from Panton Labu, North Aceh. Fresh henna leaf material was collected, washed thoroughly under running water, drained, and weighed (5,000 g) [7]. The henna leaf are then dried in a drying cupboard at a temperature of 40-500 C, until dry, discard any foreign objects that remain on the simplicia during drying (dry sorting), after sorting the dried simplicia, the dried simplicia is then crushed using a blender, the simplicia powder is stored in a plastic container which is tightly closed to prevent the influence of moisture and others. 5 L of 96% ethanol was added as a solvent [8]. The percolation vessel was closed tightly and left for 5 days protected from light and stirred every few hours. The percolate is separated by filtration, then the dregs are dried in a drying cupboard. After drying, they are re-dissolved in 5 L of 96% ethanol solvent and then left for 2 days. All the percolate is collected, then the percolate obtained is concentrated using a rotary evaporator. Then concentrate in a water bath for approximately 24 hours. The thick extract is then thickened using a water bath to obtain a thick ethanol extract [9,10,11]. Before testing on animals, first make a 0.5% CMC Sodium suspension, 0.2% Alopurinol suspension, make chicken liver juice, Potassium Bromate suspension and make a suspension of Ethanol Extract of henna leaf at a dose of 150 mg/kgBB, 300mg/Kg BB ,600mg/kg BB [12,13,14,15].

The treatment procedure for the experimental animals began by inducing the mice with chicken liver orally and potassium bromate intraperitoneally 1 hour before administering the ethanol extract of henna kuku leaves. Normal uric acid levels in mice are 0.5-1.4 mg/dl, and mice are said to have hyperuricemia if their uric acid levels are 1.7-3.0 mg/dl [16,17,18]. Test animals were fasted for approximately 18 hours before testing, but were still given water. Before being given treatment, all test animals had their blood uric acid levels measured as initial levels. Then the test animals were made hyperuricemic by giving chicken liver juice orally and potassium bromate intraperitoneally, except for the normal group which was only given 0.5% Na CMC. In the induction group, after being given chicken liver juice and potassium bromate, one hour later blood was taken from the test animals to measure their uric acid levels, then they were given 0.5% Na CMC and their uric acid levels were measured at 1, 2, 3, 4 hours. In the EEDPK group, one hour after the induction was given EEDPK preparations of 150 mg/kgBB, 300 mg/kgBB, and 600 mg/kgBB, and their uric acid levels were measured at 1, 2, 3, 4 hours. In the comparison group, their uric acid levels were measured. one hour after administering potassium bromate then measuring uric acid levels at 1, 2, 3, 4 hours after administering allopurinol. Measurement of blood uric acid levels is carried out by rubbing cotton wool that has been treated with alcohol around the tail of the mouse, cutting off a small part of the tip of the mouse's tail and pulling it slowly, touching the drop of blood on the test strip that has been installed so that it covers the surface of the test strip, where the uric acid level is. blood will be read within 10 seconds [19,20,21].

3. RESULT AND DISCUSSION

Data from measurements of uric acid levels were analyzed statistically using the ANOVA test. The condition of hyperuricemia in test animals is carried out by giving chicken liver juice, chicken liver is used because it contains high levels of purine as a forming material for uric acid, while potassium bromate is used as an inducer because it triggers an increase in xanthine oxidase metabolism as a result of which uric acid levels increase in the blood and This buildup of uric acid can cause disturbances in renal excretion. To determine the dose in this study, a dose orientation was carried out first with a dose of EEDPK Suspension Making at a dose of 150 mg/kgBB, 300 mg/kgBB, 600 mg/kgBB. in the normal group which was given 0.5% Na CMC after measuring the uric acid levels of mice within normal limits, for the negative group which was induced by chicken liver and potassium bromate the uric acid levels at the 1st hour, 2nd hour, 3rd hour, and The 4th level experienced an increase, the comparison group after being given allopurinol experienced a decrease in uric acid levels as measured at the 1st hour, 2nd hour, 3rd hour, and 4th hour, for the EEDPK 150 mg/kgBB treatment group, the mice's uric acid levels decreased. smaller than EEDPK 300 mg/kgBB, for EEDPK 300 mg/kgBB the decrease in uric acid levels was not far from the comparison group, for EEDPK 600 mg/kgBB there was a smaller decrease in levels of 300 mg/kgBB.

Measurement of uric acid levels in the inducer group increased at T0 after induction of chicken liver juice and potassium bromate, then 0.5% Na CMC was given and uric acid levels were measured again at T1, T2, T3, T4, there was an increase in uric acid, meaning that Na CMC 0.5% is not able to reduce uric acid levels which rise due to administration

of chicken liver juice and potassium bromate, Na CMC 0.5% does not have the effect of reducing uric acid levels, because Na CMC 0.5% only functions as a carrier to suspend the test substance so that the concentration of the given test substance remains homogeneous.

In the comparison group after being given allopurinol, uric acid levels decreased at T1 which was 2.2, T2 was 1.8, T3 was 1.6 and T4 was 1.3, this means that the drug allopurinol was able to reduce uric acid levels. In the EEDPK group 150 mg/kgBW experienced a decrease in T1 which was 2.3, T2 was 2.1, T3 was 1.8, and T4 was 1.5, this means that even though EEDPK 150 mg/kgBB could not reduce uric acid levels to normal in T4, but already has the effect of reducing uric acid levels. In the EEDPK 300 mg/kgBB group there was a decrease in T1 which was 2.3, T2 was 1.8, T3 was 1.7 and T4 1.4, this shows that EEDPK 300 mg/kgBB was effective in reducing uric acid levels in T4, and these levels were almost the same as the levels in the comparison group. And in the EEDPK 600 mg/kgBB group, the decrease in T1 was 2.3, in T2 it was 1.8, in T3 1.6, and T4 was 1.5, this shows that the level of reduction in EEDPK 600 mg/kgBB was almost the same. by reducing uric acid levels with EEDPK 150 mg/kgBB. Of the three EEDPK doses, the EEDPK dose is 300 mg/kgBB.

Table 1. Data on the Results of Reducing Uric Acid Levels

Data on the Results of Reducing Uric Acid Levels **Test animal group**	**Observation time**				
	T0	**T1**	**T2**	**T3**	**T4**
Normal	1,3	1,3	1,3	1,4	1,4
Induction	2,4	2,5	2,6	2,6	2,7
Comparison	2,5	2,2	1,8	1,6	1,3
EEDPK 150 mg/kgBB	2,6	2,3	2,1	1,8	1,5
EEDPK 300 mg/kgBB	2,5	2,3	1,8	1,7	1,4
EEDPK 600 mg/kgBB	2,6	2,3	1,8	1,6	1,5

Ket:

T0 : The time to measure uric acid levels one hour after administration of potassium bromate

T1 : The time for measuring uric acid levels was one hour after administering the ethanol extract of henna leaves

T2 : The time for measuring uric acid levels was two hour after administering the ethanol extract of henna leaves

T3 : The time for measuring uric acid levels was three hour after administering the ethanol extract of henna leaves

T4 : The time for measuring uric acid levels was four hour after administering the ethanol extract of henna leaves

4. CONCLUSION

Based on the research results, it can be concluded that the ethanol extract of henna kuku leaves (*Lawsonia mermis* L.) has the effectiveness of reducing blood uric acid levels in male mice (Mus musculus) which were induced with chicken liver and potassium bromate. The ethanol extract of henna kuku leaves (*Lawsonia mermis* L.) which is effective in reducing uric acid levels is the ethanol extract of henna kuku leaves at a dose of 300 mg/kgBB. The effect of reducing uric acid levels in mice given ethanol extract of henna leaves at a dose of 300 mg/kgBB was not significantly different ($p > 0.05$) from giving allopurinol, but was significantly different from giving Na CMC suspension.

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