Effect of Ethanol Extract *Sonchus arvensis* Linn Leaves on Acute Toxicity in Healthy Male Albino Rat (*Rattus norvegicus*)

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Abstract. *Sonchus* leaves are traditional plants whose effects have been widely studied including immunostimulants and diuretics. Both of these effects have benefits for maintaining health and treating diseases. The purpose of this study was to determine the acute toxic effects on healthy male albino rat after being extracted 1 time a day for 14 days. Each group of test animals was given a dose of 700, 1400, 2800, 5600 (mg/KgBW) every 10 healthy male albino rat (n=40) for acute toxicity test and toxicity tests were observed for 14 days. The albino rat in all groups were observed for behaviour, body weight development. The data obtained were statistically tested with Shapiro Wilk normality test, or Friedman followed by Wilcoxon test and calculated LD50. No deaths occurred in each dose group given ethanol extract *Sonchus*. Based on the average body weight in the dose group compared to the 0th, 7th, and 14th days has decreased. Statistics show that there were significant differences (p<0.05) between observations day 0-7, day 0-14, day 7-14 and also comparison between all groups. Ethanol extract *sonchus* did not provide toxic effects on healthy male albino rat tetapi memberikan penurunan berat badan pad tikus.

1. Introduction

*Sonchus* leaves efficacious as a diuretic [1]. *Sonchus* can shed kidney stones at a dose of 250 mg-6750 mg [2]. In general, tempuyung leaves contain compounds, flavonoids, triterpenoids [3]. These secondary metabolic compounds are thought to play an active role in giving effect as immunomodulators and diuretics.

The use of *Sonchus* as food and treatment has been widely practiced in rural communities, especially in the Linggamanik sub-village of Ciamis regency, by consuming *Sonchus* leaves as vegetables either freshly or by consuming infusion. The use of *Sonchus* leaves is based on tradition so it does not have the right dose in its use. Continuous usage in the long term either as prophylaxis and treatment of diseases requires accurate verification of safety, especially on toxic effects that will result mainly occur in acute, sub-chronic, or chronic [4].

Based on acute and sub-chronic toxicity studies conducted by [5]. *Sonchus* extract did not provide toxic effects at a dose of 100-1000 mg/kgweight. In this study acute toxicity will be tested where symptoms can arise immediately at the time of administration or within 24 hours [4]. Acute toxicity aims to establish the potential for acute toxicity (LD50), assess clinical symptoms, spectrum of toxic
effects, death mechanism of test animals, using a single dose (attempt to obtain lethal dose), acute toxicity test last for 7-14 days [6]. \textit{LD50} "single dose that statistically can kill 50\% of the animals in the test", on testing \textit{LD50} can indicate target organs damaged by toxic effects, as well as to determine the right dosage instructions are used in longer testing [7].

2. Materials and Methodes
Sonchus leaves were obtained from areas in Ciamis, and have been determined as \textit{Sonchus arvensis} at Galuh University of Ciamis. The rat that will be used have the inclusion criteria which are physical health, aged 8-12 weeks with a weight of 200-250 g, not yet treated by any drug. Animal testing were acclimatized for 7 days, not fed before they were given treatment for 14-18 hours but drinking water was given, then the weight of the animal was weighed (recorded and stated the initial weight of the rat) [4].

Sonchus leaves were macerated using 70\% ethanol solvent, then the extract obtained was evaporated in a waterbath at low temperature (less than 50 °C) until obtaining a thick extract. Extract was dissolved in CMC 1\% to prepare doses of acute toxicity test. The dosage form was administered by oral.

To determine the compound content of Sonchus Leaves extract, a preliminary test for flavonoids was carried out using the Wilstater method to dissolve magnesium and methanol. The extract was weighed as much as 500 mg and then put into a mixture of methanol and magnesium and concentrated HCl was added, if there was a yellow or orange color change, a positive extract contained flavonoids.

Acute toxicity test using the one shoot study case method was carried out for 14 days with the number of 40 male albino rat divided into 4 groups dose 700, 1400, 2800, 5600 (mg/kg weight). Each albino rat in each group was given extract concentrations of 2 ml, observations were made each time the test was administered orally (not to exceed 24 hours), feed was given 3-4 hours after the test preparation, observation time 0, 30, 60, 120, 180 minutes during 14 days of observation, animals weighed on days 0, 7 and 14 [4].

3. Result and Discussion
Preliminary test results of positive Sonchus ethanol extract containing flavonoids are indicated by the appearance of orange color using the Wilstater method. Mg and concentrated HCl function to reduce the benzopirone nucleus found in the flavonoid structure so that the color changes become red or orange [8].

The administration of Sonchus ethanol extract in each dose group did not give death to male albino rat, so the \textit{LD50} at the dose was categorized as non-toxic. Observation of body weight on days 0, 7 and 14 there was a change in body weight where days 7 and 14 decreased. Comparison of body weight from day 0-7, days 7-4, days 0-14 in each dose can be seen in table 1.

The average weight of the 7th and 14th days in each dose group decreased when compared to day 0, and the statistical results showed there were significant differences p <0.05, meaning that Sonchus ethanol extract affected the weight of rat from day to day. Likewise, the ratio between the dose size and the weight gives a significant difference p<0.05. From the overall dose, a dose of 2800 and 5600 (mg/kg weight) had an average weight loss is high at day 14.
Table 1. Comparison of body weight of male albino rats on day 0 and 7 (n = 40) in each dose group (mg / kg weight)

| Doses | Rat Weight (g) (Mean±SD) |
|-------|--------------------------|
|       | 0       | 7       | 14      |
| 700   | 212±16,9 | 197±17,6 | 178±14 |
| 1400  | 206±10,8 | 194±14,8 | 163±9,6 |
| 2800  | 206±7,7  | 172±11,8 | 149±10,2 |
| 5600  | 214±12,9 | 198±17,8 | 131±12,2 |

P<0.05 comparison between days 0 and 7 in each dose group
P<0.05 comparison between days 0 and 14 in each dose group
P<0.05 comparison between days 7 and 14 in each dose group
P<0.05 comparison of the entire dose group

Information:
Day 0: Before giving Sonchus leaves ethanol extract.
Day 7: After giving Sonchus Leaves ethanol extract for 7 days.
Day 14: After giving Sonchus leaves ethanol extract for 14 days.

This decrease in weight is estimated due to the influence of the content of flavonoid compounds that can cause inhibition of absorption of cholesterol in the intestine and production of VLDL (very low-density lipoprotein) in the liver and can interfere with the sugar reabsorption process of kidney filtrate [9]. In addition, the diuretic effects caused by the administration of Sonchus can cause a decrease in the weight of the rat, as evidenced by observations on the 11th to 14th days, some rat experienced urination excessive, rat became frequent drinking and decreased appetite.

4. Conclusion
Based on the results of the study, it is known that at levels of 700-5600 mg/kg weight Sonchus ethanol extract does not provide a toxic effect, so that the dosage can be used, but has side effects that can reduce weight.

5. References
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