

ANTI-INFLAMMATORY EFFECT OF LEAF ETHANOL EXTRACT OF CAT'S KUMIZE (*Orthosiphon stamineus* Benth) IN MALE WHITE RATS OF WISTAR STRAINS

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Abstract

*The cat's whiskers plant is empirically used by the community for the treatment of gout and rheumatism. This research was conducted with the aim of knowing the anti-inflammatory power of cat's kumis (*Orthosiphon stamineus* Benth) leaf extract. This study was a quasi-experimental study with a one-way completely randomized design. Kumis Kucing leaf extract was extracted using 70% ethanol. A total of 25 male wistar rats aged 2-3 months, weighing 150-200g were divided into 5 groups. Each group was treated orally with distilled water (negative control), diclofenac sodium 2.25 mg/kg BW (positive control). Kumis leaf ethanol extract tested at doses of 123, 245 and 490 mg/kgBB. Treatment 1 hour before the feet of rats were inflamed with 1% subantar carrageenin. Measurements of the rat's foot volume were carried out every 0.5 hours for 6.5 hours. The obtained average edema volume curve is used to calculate AUC (Area Under The Curve) and the obtained AUC is used to calculate DAI (Anti-Inflammatory Power). The AUC and DAI data were tested statistically with one way Anava and followed by LSD with a 95% confidence level. The results showed that the ethanol extract of Kumis Kucing leaves had an anti-inflammatory effect on male white rats of the Wistar strain. Kumis Kucing ethanol extract at doses of 123, 245 and 490 mg/kg BW yielded 33.11%; 52.64% and 64.12% respectively. The results showed that the ethanol extract of Kumis Kucing leaves had an anti-inflammatory effect on male white rats of the Wistar strain. Kumis Kucing ethanol extract at doses of 123, 245 and 490 mg/kg BW yielded percent anti-inflammatory properties of 33.11%; 52.64% and 64.12%, respectively. The results showed that the ethanol extract of Kumis Kucing leaves had an anti-inflammatory effect on male white rats of the Wistar strain. Kumis Kucing ethanol extract at doses of 123, 245 and 490 mg/kg BW yielded percent anti-inflammatory properties of 33.11%; 52.64% and 64.12%, respectively.*

Keywords: Anti-inflammatory, *Orthosiphon stamineus* Benth., diclofenac sodium, ethanol extract.

INTRODUCTION

The use of natural materials, both as medicine and for other purposes tends to increase, especially with the issue of back to nature. Traditional medicines and medicinal plants are widely used by the community, especially in preventive, promotive and rehabilitative efforts. Meanwhile, many people think that the use of medicinal plants or traditional medicine is relatively safer than synthetic drugs. In order to use it optimally, it is necessary to know adequate information about medicinal plants. Adequate information will help the public to be more careful in choosing and using a traditional medicinal product or medicinal plant in health efforts.

The cat's whiskers plant (*Orthosiphon stamineus* Benth.) is very easy to find throughout the archipelago. This plant is very easy to grow so it is easy to breed. Cat whiskers have been used by the community for diuretics, the treatment of hypertension,

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gout and rheumatism (Barnes et al., 1996). In gout and rheumatism, inflammation occurs because inflammation is a manifestation of tissue damage. Anindhita's research (2007) showed that herbal infusion of cat's whiskers had anti-inflammatory properties in male white rats of the Wistar strain.

The cat's whiskers plant contains various chemical compounds, one of which is flavonoids. Research on flavonoids from several plants has a pharmacological effect as an anti-inflammatory (Narayana et al., 2001). Flavonoids contained in *simplicia* from Kumis Kucing leaves can be extracted using water or ethanol 7096 (Harbone, 1987). Extraction carried out using water as a solvent will result in substances that tend to be polar. Water solvents have the disadvantage of causing a fermentative reaction resulting in faster destruction of the active ingredients. Another weakness is that it causes swelling of the cells so that the active ingredient will bind tightly to the *simplicia*, the aqueous solution is also easily contaminated. Alcoholic solvents are the main choice for all types of flavonoids (Soemardi, 2004). Ethanol solvent can be used to extract substances with relatively high to relatively low polarity, because ethanol is a universal solvent. Ethanol has advantages over water, namely it does not cause cell swelling, inhibits the action of enzymes and improves the stability of dissolved drug substances. Ethanol 700 is very effective in producing optimal active ingredients, the ballast ingredients that are also extracted in the extractor liquid are only a little, so that more active substances are extracted (Voigt, 1995).

Mice are animals that can be used for anti-inflammatory testing with various chemical stimulants. In the anti-inflammatory test, the rats were stimulated to cause edema. One of the substances that can be used as an edema inductor is carrageenin. Carrageenin is a Chondrus extract, which is a sulfated polysaccharide with a large molecule that can cause inflammation when injected subplantar into mice, so it can be used as an inflammatory inducer (Corsini et al., 2005, Domer, 1971). In order to obtain scientific data regarding the anti-inflammatory effect of Kumis Kucing leaves, it is necessary to study the anti-inflammatory effect of this extract on Wistar male white rats.

Formulation of the problem

Based on this background, the problem can be formulated, namely whether the ethanol extract of Kumis Kucing leaves has anti-inflammatory properties in male white rats with Wistar strain induced by 1% carrageenin solution?

RESEARCH METHOD

Research Category and Research Design

I. Type of Research

The research category used included the quasi-experimental research category, namely observing the possible influence between variables by observing the quasi-experimental group in various treatment conditions and comparing it with the control group. This study used a completely randomized design with a one-way pattern.

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2. Research Variables

a. Independent variable

The independent variables in this study were the test animals that were treated with ethanol extract of Kumis Kucing leaves at doses of 123 mg/kg, 245 mg/kg, and 490 mg/kg, diclofenac sodium at a dose of 2.25 mg/kg, and distilled water.

b. Dependent variable

The dependent variable in this study was the edema volume of rat feet.

c. Control variable

The control variables in this study are:

- 1) Selection of mice: strains, conditions, sex, age, body weight of the mice used.
- 2) Selection of herbs: where to grow, when permanent, and plant parts used

RESULTS AND DISCUSSION

Determination Results of Cat Whisker Plants

The cat's whiskers plant that will be used in this study is determined first. This determination was made in order to obtain certainty that the herbs used in this study came from the plant in question.

The determination of the cat's whiskers plant was carried out by looking at the morphology of the plant which was then matched with the key of determination contained in the flora book (Van Steenis, 1947). *Orthosiphon spicatus* BBS has the synonym *Orthosiphon stamineus Benth*. The results of the determination can be seen in Appendix 2.

Extract Production Results

Kumis cat leaves weighing 1.3429 kg are dried in an oven at a temperature of not more than 40°C. In drying simplicia, 228.85 g of dried cat's whiskers leaves were obtained. The simplicia obtained was contaminated with fungus, this happened because the environmental conditions supported the growth of the fungus during the drying process. For example humid conditions and temperatures less than 40°C is the optimum temperature for mold growth. Drying using an oven has no airflow so the conditions in the drying room are damp. This condition is very suitable for mushroom growth. Good drying is low temperature and fast evaporation so that the environment around the simplicia is not damp. The general rule for drying leaves and herbs is with a drying temperature between 20°C and 40°C. Drying that might be suitable for this cat's whiskers leaf simplicia is by simply letting it dry at room temperature. After dry sorting and sieving, the simplicia obtained weighs 125 g. The extract obtained was 12.270g or had a yield of 9.81674 w/b.

Preliminary Test

Before the anti-inflammatory power test is carried out, a preliminary test (orientation) is carried out first. The orientations carried out included determining the dose of diclofenac Na, determining the timing of diclofenac Na administration, determining the dose of Kumis Kucing leaf extract, and determining the time of administration of Kumis

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Kucing leaf extract. The first preliminary test was the orientation of the positive control dose of diclofenac Na. The orientation of diclofenac Na is 2.25 mg/kgBW and 6.75 mg/kgBW. The orientation of the dose of diclofenac Na administration was carried out to determine the dose that could provide the optimal anti-inflammatory effect on the test animals.

Anti-inflammatory Test

The study of anti-inflammatory activity was carried out by treating male white rats of the Wistar strain which were injected orally with the ethanol extract of Kumis Kucing Ijam leaves before injection of 1% carrageenan. The extract doses used were 123 mg/kg, 245 mg/kg, and 490 mg/kg. The negative control used distilled water and the positive control was 2.25 mg/kg BW diclofenac Na. Wistar strains with doses of 123, 245 and 490 mg/kg BW respectively 33.11 K: 32 64Ye and 64.12Y40.

The anti-inflammatory power of this plant at doses of 245 mg/kg and 490 mg/kg is quite good because it can inhibit inflammation by more than 50%. With these results it can be seen that cat's whiskers leaves have potential as an anti-inflammatory. The anti-inflammatory ability of cat whiskers leaf extract is probably due to the ability to inhibit cyclooxygenase and lipooxygenase enzymes so that arachidonic acid is not converted into prostaglandins and leukotrienes. This inhibition is probably caused by the flavonoids extracted in this extract, because flavonoids in general have the ability to inhibit cyclooxygenase and lipooxygenase enzymes. In a previous study, the infusion of cat kumis leaves at a concentration of 10% which was equivalent to the ethanol extract of cat kumis leaves at a dose of 123 mg/kg BW had a % anti-inflammatory effect of 45.64%, and infusion of 20% kumis Kucing leaves which is equivalent to the ethanol extract of 245 mg/kg BW of Kumis Kucing leaves has an anti-inflammatory capacity of 50.71%. The anti-inflammatory power of this ethanol extract is almost the same as that of infusion which may be due to the substance dissolved in 70% ethanol is almost the same as that extracted in water extraction.

CLOSING

The ethanol extract of Kumis Kucing leaves tested had anti-inflammatory properties in Wistar male white rats which were lower than the positive controls, namely at doses of 123, 245, and 490 mg/kg, respectively 33.11%; 52.64" and 64.12%.

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