

SOCIALIZATION OF ANALGESIC EFFECTIVENESS OF REED ROOT ETHANOL EXTRACT (*Imperata cylindrica L.*) ON MALE WHITE MICE

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Abstract

Pain is an unpleasant experience due to the presence of tissue damage. When a tissue is injured or damaged, it results in the release of materials that can stimulate pain receptors such as prostaglandins that will result in a pain response. Therapy using analgesic drugs can relieve pain. Empirically the roots of reeds are used as folk remedies for pain relief. Phytochemical screening results showed that reed roots contained flavonoids. Flavonoids contained in the roots of reeds can reduce pain by inhibiting the work of the enzyme cyclooxygenase. Tests that have been carried out on twenty male white rats induced using the infra red plantar test prove that there is a difference in the resistance of mice in resisting heat induction after being given the extract. Twenty male mice are divided into four groups. Three groups were given reed root ethanol extract at doses of 15, 30 and 60 mg/kg bb, one negative control group was given 0.5% CMC-Na and a positive control group was given mefenamic acid. The data obtained were processed using a one-way ANOVA and followed by a 95% level test. The conclusion can be that the higher the concentration the greater the analgesic power exerted, it is seen that the longer the response of mice in resisting the heat induction of the plantar test infra red.

Keywords: Analgesics; *Imperata cylindrica L.*; Plantar test infra red

1. Introduction

Various plants in Indonesia that are traditionally used to overcome health problems, one of which is the reed root (*Imperata cylindrica L.*). The use of folk remedies has become a habit among the people and is developing very rapidly. Traditional medicine is widely used to maintain health and is in great demand because of its not too expensive price and affordable availability for the community, especially in villages or small towns where there are rarely health centers. Compared to modern medicine, traditional medicine has several advantages, namely that the side effects are relatively low.

Non-narcotic analgetics are drugs that act on the peripheral and central nerves of the central nervous system by inhibiting the formation of prostaglandins so that the sensity of pain receptors can be reduced. Side effects of this drug are disorders of the stomach and intestines by salicylates, prostaglandin inhibitors (NSAIDs) and pyrazolone derivatives, blood damage (paracetamol, salicylates, anthracnilate derivatives, and pyrazone derivatives), liver and kidney damage (paracetamol, and anthracnilate derivatives), allergies to the skin. Such side effects occur mainly in long-term use of the drug and also high doses (Tan & Rahardja, 2007).

Reeds (*Imperata cylindrica* L.) belong to the plant family Gramineae or Poaceae. This plant grows wild anywhere without being used and is more often considered a nuisance plant. The reed plant (*Imperata cylindrica* L.) actually has many properties. The roots, rhizomes and flowers of reeds are the parts that can be used for treatment.

Reed leaves and flowers have the potential to inhibit the growth of bacteria *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis* and *Staphylococcus aureus* (Mulyadi, 2013). Decoction of reed rhizomes concentration of 30%, 40% and 50% produces a diuretic effect at the 90th minute in mice (Elysa, 2014). In fact, research has also been carried out on the effect of giving thatch root alcohol extract on body temperature in male white rats by Chairul (2000) which states that giving thatch root alcohol extract at a dose of 50 mg / kg bb can provide an antipyretic effect equivalent to giving paracetamol 200 mg / kg bb. From the results of seniwaty phytochemical screening (2009) showed that positive reed plants contain secondary metabolites such as alkaloids and flavonoids. Flavonoids have the potential to reduce pain by inhibiting the work of the cyclooxygenase enzyme (Safwan et al., 2016).

Based on the description above, the reed root (*Imperata cylindrica* L.) has been researched that the reed root contains flavonoids that can relieve pain in male white mice.

2. Methods

This service activity is carried out through seminars using lecture methods, question and answer, and demonstrations. Identification of flavonodi compounds on the roots of reeds is carried out through phytochemical screening. Extraction of reed roots is carried out by the method of maceration. Analgesic tests were carried out using a plantar test tool by looking at the response of mice to heat induction. The steps of the procedure used in the activities of this service are as follows:

a. Preparation stage

Prepare socialization materials containing the equipment and materials used as well as media that support this activity. The samples used were reed roots which were prepared in powder form.

Materials: reed root, sodium carboxymethyl cellulose, ethanol, aquadest, bismuth nitrate, potassium iodide, α -naphthol, nitric acid, sulfuric acid, iron chloride, lead acetate, sodium hydroxide, hydrochloric acid, chloroform, sodium sulfate and acetic acid.

Equipment: laboratory glassware, scales, microscopes, thermometers, porcelain rates, vaporizer cups, squeak cages, plantar tests, oral sondes, syringes, lumps and stampers.

b. Implementation stage

Socialization about the analgesic effectiveness of reed roots was carried out directly to participants through seminar activities. This socialization is expected to open up and expand the knowledge of participants. Reed root extract was obtained by maceration with 70% ethanol. Analgesic tests are performed using an infra red plantar test tool.

In the test group, each experimental animal was given a test substance with an appropriate dose of 0.2 ml / 20 gr bb orally. After the administration of the test substance, the test animal is put into a chamber plantar test which has determined the magnitude of its infra red intensity and measured every 10 minutes for 1 hour.

c. Evaluation and Follow-Up

The implementation of the service activity evaluated the understanding of the seminar participants through discussions and questions and answers regarding the results of the reed root analgesic test. Then carry out follow-up activities when participants are still unable to understand well.

3. Result and Discussion

The implementation of the service activity evaluated the understanding of the seminar participants through

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activities when participants are still unable to understand well.

Table1. The average response time results of mice withstand infrared (IR) heat induction every 10 minutes for 60 minutes

Group	Induction time					
	10	20	30	40	50	60
	Average Pain Response (seconds)					
CMC- Na 0,5%	7,18	8,2	7,6	8,5	7,3	6,8
reed root ethanol extract 15 mg/kg bb	10,8	13,3	14,4	18,2	17,2	15,2
reed root ethanol extract 30 mg/kg bb	13,6	17,5	15,8	19,4	16,4	16,1
reed root ethanol extract 60 mg/kg bb	15,9	17,9	17,9	20,1	17,0	17,2
Mefenamat acid 500 mg/kg bb	20,5	22,3	22,7	24,0	20,4	19,6

Of the three concentration variations, the highest peak of the analgesic effect is seen at the 40th minute, and decreases back slowly after the following interval of the 10th minute. The parameter measured in heat pain induction is the reaction time, which is the time span between the administration of pain induction to the occurrence of pain response from experimental animals. This time span can be extended by administering analgesic drugs, the extension of the time span of this reaction is used as a measure in evaluating analgesic activity (Sirait, et al.1993). The higher the concentration of reed root ethanol extract, the higher the analgesic power in male white mice.

The results obtained from this service activity are as follows:

1. The seminar material can be understood by the seminar

participants as evidenced by the result of pre-test and post-test showed 95% participants had understood.

2. Seminar participants gain new knowledge about the benefits of several ornamental plants that can be used as medicinal plants.

4. Conclusion

The higher the concentration of ethanol extract from the roots of reeds, the greater the analgesic power given to experimental animals. Reed root ethanol extract provides the highest analgesic power in the 40th minute and decreases in the next 10 minutes.

Based on the results of tests conducted on participants involved in socialization, it was stated that around 95% of participants had understood the material presented.

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Figure1. Socialization by zoom

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