



## Effectiveness of Analgesic of Ethanol Extract of *Uli* Banana (*Musa Paradisiaca L*) Midrib in Thermic and Chemical Way on White Male Mice

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### Abstract

Utilization of banana in industries is not popular yet, and what is known so far is still limited on its fruit. Processing of other parts which were the waste like the stem, the leaves, the peel, and the midrib is still a little especially on the midrib part that there is still no processing in it. The banana midrib is usually used by some people in Indonesia as the painkiller. The objective of this research was to investigate the effectiveness of analgesic of the ethanol extract of uli banana midrib on the white male mice. The research method was carried out by doing extraction using ethanol 96%, and then being rotated to gain condensed extract. The research applied experiment which was full random design with 5 treatments, each treatment with 3 repetitions. In the analgesic testing, *Asam Mefenamat* was used as the positive control for the testing in the thermic way, *Antalgin* was used for the testing in the chemical way, and Na.CMC was used as the negative control. The data was analyzed by using SPSS. Based on the research result, it was obtained that the extract of the uli banana midrib could reduce pain on the Dose 3 in the chemical way with the analgesic capacity percentage of 53.8%, and with the analgesic capacity percentage in the thermic way of 85.33%. From this research, it could be concluded that the extract of the *uli* banana midrib could reduce pain on the white male mice.

**Keywords:** *Uli* Banana, Analgesic, Extract

### Introduction

Banana (*Musa paradisiaca*) is a fruit plant, an herb, native from areas in South East Asia. The banana plant (*Musa*, sp) is one of the plants widely found in Indonesia, but there is still no complete information reference either from the phytochemical sector or from the pharmacological one to benefit it optimally. Utilization of banana in industries is not popular yet, and what is known so far is still limited on its fruit [1-3]. Processing of other parts which were the waste like the stem, the leaves, the peel, and the midrib is still a little especially on the midrib part that there is still no processing in it. The banana midrib is usually used by some people in Indonesia as the wound cure, and some other parts of the banana plant have been researched for their benefit which was that for an instance, the extract of the ambon banana stem benefits to accelerate wound healing on mice [4-10].

### Materials and Methods

#### Materials

The tools used in this research were a knife, an analytical balance, a drop pipette, a dark brown bottle, filter paper, safety devices like gloves and a mask, a set of *siegmund* tool, oral syringe, a kilogram scale, a stopwatch, a refrigerator, a mortar, a stamper, and a hot plate. The materials used in this research were *uli* banana midrib (*Musa x paradisiaca L.*), aquadest, alcohol 96%, male mice, acetic acid, asetosal, Na CMC, and *Antalgin*.

#### Time and place of research

This research would be conducted starting from June 2015 in Pharmacognosy Laboratory, Pharmacology Laboratorium of Akademi Farmasi Al-Fatah Bengkulu.

#### Pain induction method in chemical way

Pain induction chemically applied acetic acid 3% dissolved into NaCl 0.9% by applying injection intraperitoneally given 30 minutes after giving the test material orally [11]. The pain was indicated by the appearance of writhing or stretching signaled by the abdominal part

touching the central foothold and two pairs of feet being pulled back [12].

#### Pain induction method in thermic way

The pain induction in the thermic way was done by putting the mice on the hot plate with the fixed temperature of 55 C as the pain stimulus, and the mice would give response like licking the back feet or jumping. The time interval between the administration of the pain stimulus and the response occurrence was called reaction time. This reaction time could be prolonged by analgesic medications. The extension of the reaction time could serve as the measurement in evaluating the analgesic activity [12-16]. Randomly group in 6 groups within each consisting of 3 mice.

#### Analgesic Effect

The test material was given orally 30 minutes before the acetic acid was injected. The observation was done by observing the total of stretching emerging immediately for 30 minutes with the interval of 5 minutes. The analgesic effect of the tested materials could be seen from the suppression of the number of stretching emerging for 30 minutes compared to asetosal [17-18].

#### Data Collection

The observation was made once in 5 minutes for 30 minutes after being given drug delivery treatment. This aimed to find out the symptom changes happening after being given treatment by comparing the symptom or behavior before the treatment was blocked by the banana midrib. The observation criteria included the observation toward the clinical symptoms like the mice writhing several times in 5 minutes.

#### Data Analysis

On this research, to analyze the data result SPSS analysis was used.

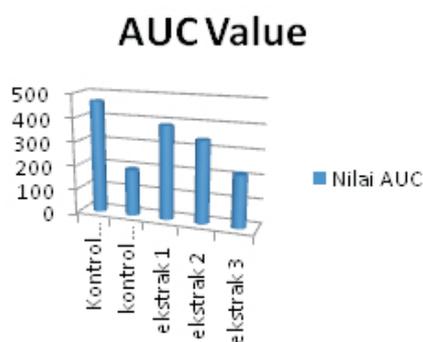
**Results and Discussion**

**Table 1:** Percentage of Analgesic Capacity of Uli Banana Midrib Extract (*Musa x paradisiaca* L.)

Treatment Groups	% Analgesic Capacity
Control (+) with Asetosal	57.8 %
Extract with Dose 1	17.7 %
Extract with Dose 2	27.8 %
Extract with Dose 3	53.8 %

The calculation and dose taking for the analgesic test were applied variedly based on the traditional usage. To investigate the effectiveness of a plant extract which had a property as a medicine, it was required to have a comparator whose effectiveness had been proven on the meant disease so that in this research asetosal with 500 mg dose was used for the testing in the chemical way, while for that in the thermic way 500 mg *Antalgin* was applied, the selection of the positive control was based on the pain stimulus used. Analgesic was a substance that could be used to reduce pain, and the *uli* banana midrib had a potential to be the analgesic according to the empirical studies. Therefore, the research was carried out to test the analgesic effectiveness of the *uli* banana midrib on the mice set to be in pain by using the *hot plate* and induced with the acetic acid as the pain stimulant on the test animals.

The calculation of the AUC (Area Under Curve) value of the analgesic testing of the ethanol extract of the banana midrib was presented as follow:



**Figure 1:** Bar chart of the AUC value

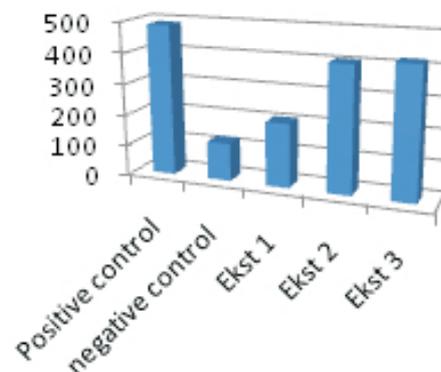
**Result of analgesic in the chemical way**

The analgesic testing in the chemical way made use of the pain inducer of the acetic acid 1 %. The AUC value result of each treatment group was that the AUC value of the negative control was 466, while that of the positive control was 197, meaning that there was significant difference between the positive control (asetosal) and the negative one (aquadest). The positive control was more potential to be the analgesic. The AUC value of the *uli* banana midrib (*Musa x paradisiaca* L.) with dose 1 was 387, that with dose 2 was 337, and that with dose 3 was 217. As seen from the AUC value obtained from each dose variation on the extract above, it showed that there was significant difference from each treatment group. The extract of the *uli* banana midrib (*Musa x paradisiaca* L.) with dose 3 was more potential as the analgesic than that with dose 1 and 2. However, it was not better than the positive control (asetosal).

**Table 2:** Percentage of analgesic testing capacity with pain induction method in the thermic way

No	Extract Group	Analgesic Capacity
1.	Dose 1(7.02mg)	65.33%
2.	Dose 2(14.04mg)	84%
3.	Dose 3(21.06mg)	85.33%

The testing of the analgesic effectiveness was conducted in the thermic way, namely inducing pain on the mice with a hot plate in the temperature of 55-65°C. The result acquired from the observation was presented in the form of AUC (Area Under Curve) table, bar chart, and proceeded to SPSS 16 processing of one way anova (trust level of 95% and  $\alpha = 0.05$ ). The observation result was done by calculating the value of AUC (Area Under Curve) which was the broad overview under the curve of the analgesic response from each treatment group of AUC calculation done by comparing the AUC value of each treatment group, the bigger the AUC value of the treatment group, the better the analgesic influence on the treatment group, and vice versa.



**Figure 2:** Bar chart of the AUC value result of analgesic in the thermic way

The AUC value result of each treatment group was as follow: the AUC value average of the positive control was 488.5, while that of the negative control was 123, meaning that there was significant difference between the negative control and the positive one where the positive one had the property more as the analgesic. The AUC value of the extract with dose 1 was 207, that with dose 2 was 405.5, and that with dose 3 was 419.5. As seen from the AUC value acquired from each dose variation on the extract above, it showed that there was significant difference of each treatment group. The *uli* banana midrib extract with dose 3 had the property more as the analgesic if compared to that with dose 1 and 2. However, if compared to the positive control (*Antalgin*), that with dose 3 was not better.

**Conclusion**

The conclusion of this research was that the ethanol extract of *uli* banana midrib contained saponin compound and had the ability to reduce pain on the male mice.

**Conflicts of Interest**

The authors confirm that this article content has no conflict of interest.

**Acknowledgement**

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