

Evaluation of Analgesic Activities of Ethanolic Extract of *Anredera Cordifolia* (Ten) Steenis Leaf

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Abstract: The study was designed to evaluate the analgesic activities of ethanolic extract of binahong (*Anredera cordifolia*) leaf using plantar test method. A significant ($p < 0,05$) analgesic effect was observed with 100 mg/kg, 200 mg/kg and 400 mg/kg. The maximum analgesic response was produced with extract doses of 400 mg/kg. This results suggest that the ethanolic extract of *Anredera cordifolia* has exhibited significant analgesic effect, which were comparable with standard drugs.

Keywords: Binahong, *Anredera cordifolia*, plantar test, analgesic, ethanolic, extract.

Introduction

Anredera cordifolia (Binahong), family Basellaceae is creep plants empirically used by wider community to assist the process of healing various disease including speed up the process of drying the wound¹. *Anredera cordifolia* was one of plant that used by Vhavenda community (Limpopo province) for treatment of sexually transmitted diseases and AIDS, against type one of herpes virus, and as antibacterial to *Bacillus pumilus*².

Based on literature and the experience of society, *Anredera cordifolia* leaves used to burn healing, and there is no scientific research evidence base³. *Anredera cordifolia* have been reported contain alkaloids, polyphenol, saponins⁴, triterpenoids/ steroids, flavonoids and volatile oil⁵.

Based on the above, researcher was interested to investigate the analgesic activity of *Anredera cordifolia* ethanolic extract using plantar test method.

Material and method

Plant material

The leaves of *Anredera cordifolia* were collected from Lhoksumawe, Nangroe Aceh Darussalam province. The plant material was identified in Research Centre for Biology, Indonesian Institute of Science, Bogor, and the voucher specimen was deposited in herbarium.

Extraction

The leaves were dried and then ground into coarse powder for the maceration process with ethanol at room temperature. After exhaustive extraction, the ethanolic extract was concentrated under reduced pressure at

50°C, dried using freeze drying ⁶, and stored in a vacuum desiccators. The suspension of the extract prepared in 1% CMC-sodium was used in the entire experimental studies.

Animals

Wistar albino rats weighing (150-200 g) of either sex were obtained from pharmacology laboratory, Faculty of Pharmacy, University of Sumatera Utara, Indonesia, and were acclimatized for two weeks under standard housing conditions (24°C; 45-55% RH with 12:12 h light/ dark cycle). The animals had free access to standard rat food and water ad libitum. All experimental procedures were reviewed and approved by Animal Ethics Committee, Biology Department, Mathematics and Natural Science Faculty, University of Sumatera Utara.

Plantar test

The plantar test was used to measure analgesic activity. Five groups of rat (n= 6) were treated orally with ethanolic extract (100 mg/kg; 200 mg/kg; 400 mg/kg), diclofenac sodium (2,25 mg/kg) and CMC-sodium 1%. After 30 minutes administration of treatment every animal was placed on plantar test and the infra red was directed under foot of rats and the reaction latency (in seconds) for licking of hind paw or jumping noted. Recording were taken before treatment with the different drugs and 10, 20, 30, 40, 50 and 60 minutes post treatment. Result was expressed as the difference between the baseline reaction latency and the reaction latency at recorded times⁷.

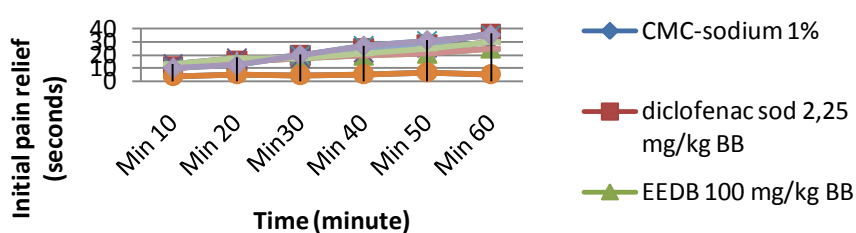
Statistical analysis

All the results were expressed as mean \pm standard deviation (SD). Data was analyzed using one-way ANOVA followed by Duncan test. P values <0,05 was considered as statistically significant.

Results and discussion

In this study, we have demonstrated the effect of *Anredera cordifolia* ethanolic extract (100; 200; 400 mg/kg p.o) on plantar test. The results of plantar test were shown in Table I.

The ethanolic extract 400 mg/kg showed the best analgesic activity on 60 minute, followed by 200 mg/kg and the last 100 mg/kg if compare with diclofenac sodium (2,25 mg/kg) were shown in Picture I.



Picture I. Initial graph there is pain versus time

Table 1. Effect of ethanolic extract of *Anredera cordifolia* on the plantar test in rat

No	Treatment	Initial Pain Relief (seconds)					
		10	20	30	40	50	60
1	CMC-sodium 1%	3,92 \pm 1,05	5,17 \pm 2,21	4,34 \pm 0,56	5,37 \pm 1,27	6,63 \pm 1,88	5,12 \pm 2,05
2	Diclofenac sodium 2,25 mg/kg bb	11,58 \pm 2,82	15,48 \pm 4,06	19,75 \pm 3,33	25,56 \pm 2,60	28,30 \pm 1,03	36,22 \pm 1,81
3	EEDB 100 mg/kg bb	9,33 \pm 2,16	14,32 \pm 3,12	17,60 \pm 4,23	19,72 \pm 5,28	21,22 \pm 4,05	25,17 \pm 2,50
4	EEDB 200 mg/kg bb	13,30 \pm 3,82	17,98 \pm 3,03	17,67 \pm 4,97	21,67 \pm 2,65	25,27 \pm 4,10	30,18 \pm 4,15
5	EEDB 400 mg/kg bb	10,25 \pm 3,84	12,28 \pm 2,07	20,08 \pm 5,45	26,82 \pm 2,57	31,03 \pm 4,55	35,10 \pm 3,90

Based on the result of variance analysis was showed the significant difference between group treatment from 10 minute to 60 minute. The ANOVA results was showed the F count value bigger than the F table value ($p < 0,05$) and continue with Duncan test shown that administration ethanolic extract 400 mg/kg did not differ significantly with diclofenac sodium (2,25 mg/kg).

Plantar test was also assayed to characterize the analgesic activity of extract. It is possible that ethanolic extract of *Anredera cordifolia* exerts an analgesic effect probably by inhibiting the synthesis of prostaglandins⁸.

Anredera cordifolia contains alkaloids, flavonoids, triterpenes/ steroids, polyphenol, saponins and volatile oil. Steroids/ triterpenoids and flavonoids have been shown to possess various biological properties related to antioxidant, antinociceptive, and anti inflammatory mechanism by targeting reactive oxygen species and prostaglandins which are involved in the late phase of acute inflammation and pain perception^{9,10,11}.

Diclofenac sodium, a COX-inhibitor at the dose 2.25 mg/kg p.o. significantly reduced pain. This indicates action against release of histamine, serotonin and kininsin early phase, while later phases are suspected to be arachidinate metabolites producing an edema dependent on mobilization of neutrophils¹².

In conclusion, this study demonstrated that the etanolic extract of *Anredera cordifolia* have a significant analgesic activity.

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