EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF *CALOTROPIS GIGANTEA*

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Summary

Anti-inflammatory activity of the Total aqueous extract of dried aerial parts (CAI) and Water soluble fraction of latex (CAII) of *Calotropis gigantea* was studied in albino rats of Wistar strain using the carrageenan induced paw edema model. The Total aqueous extract (CAI) (50 and 100 mg/kg.b.w. i.p.} and Water soluble fraction of latex (CAII) (25 and 50 mg/kg.b.w. i.p.) inhibited carrageenan induced rat paw edema. The results indicated that all the extract produced significant ($p < 0.05$) anti-inflammatory activity when compared with the standard drug (Diclofenac sodium) and untreated control.

Keywords - Anti-inflammatory, *Calotropis gigantea.*

Introduction

Scientific interest in medicinal plants has burgeoned in recent times due to increased efficiency of new plant derived drugs and rising concerns about the side effects of conventional medicine. Inflammation is seen in conditions such as Alzheimer's disease, cancer, irritable bowel syndrome and hepatic diseases. It is believed that controlling inflammation may help to alleviate these conditions or even prevent them.

Calotropis gigantea has been reported to have various pharmacological activities like antifertility, cardiotonic, antimicrobial and many more**.**[1] Thus the present investigation was carried out to evaluate the anti-inflammatory potential of *C. gigantea.*

The anti-inflammatory effect of the extract was also compared with the standard drug viz. Diclofenac sodium.

Methods

***Procurement of Plant Material*:** The dried aerial parts of *C. gigantea* were procured from the local market of Mumbai and the sample was authenticated at Agharkar Research Institute, Govt. of India, Pune. The latex oozing out from the plant was collected through giving 'V' shaped incision on the branches of the plant, planted in the medicinal garden of the institute which is an authenticated species.

***Preparation of extract*:** The Total aqueous extract (CAI) of the aerial parts was prepared by decoction method using distilled water as solvent. The fresh latex was collected and dried in vaccum oven at 60°C for 48 hours. The dried latex was suspended in water and filtered to get the water soluble fraction (CAII).

Animals: Albino rats of Wistar strain of the either sex (150 –200g), maintained under standard environmental conditions (270±20^{o}C, relative humidity 60±5% light-dark cycle of 12h) and fed with standard pellet diet and water ad libitum, were used for the present study. All he experimental protocols were approved by Institutional Animal Ethics Committee.

I Anti-inflammatory activity: [2] The rats were divided into 4 groups where six animals in each group were used for study. Acute inflammation is produced by the sub–plantar administration of 0.1ml of 1% w/v carrageenan (SD fine – Chem Ltd.) in 5% w/v gum acacia in the right hind paw of rats [3]

The Group I was treated with Total aqueous extracts (CAI) (50 and 100 mg/kg.b.w. i.p.},Group II with Water soluble fraction of latex (CAII) (25 and 50 mg/kg.b.w. i.p.), Group III with Diclofenac sodium (Sun Pharmaceuticals) (10 mg/kg.b.w. i.p..) and Group IV as Control (5%w/v gum acacia) was administered intrapertionally. The paw volume was measured before the injection and then at intervals of 30 min. for a period of 2 h after carrageenan injection using plethysmometer. The animals were pretreated with the extract 30min. before the administration of carrageenan.
% inhibition of inflammation was calculated using the formula.

Formula:

Where % inhibition = 100[Vc -Vt/Vc]
'Vc' represents oedema volume in control and 'Vt'
Oedema volume in treated with test extracts.

Statistical Analysis: Results are expressed as Mean ± S.D. The statistical analysis was performed by using unpaired Student's t- test for comparing test group with control group. P values < 0.05 were considered statistically significant.

Results and Conclusions

Table I Effect of administration of CAI, CAII and Diclofenac on Carrageenan induced rat paw edema.

Groups	**Dose** **Mg/kg b.w. i.p.**	**% Inhibition of edema at end of 2 hour.** **(Mean ± S.D)**
Diclofenac	10	96.5 ± 2.35
CAI	50	65 ± 1.13*
	100	82 ± 2.17*
CAII	25	70 ± 1.45*
	50	85 ± 2.05*

Values are expressed as mean ± S.D.

CAI**:** Total aqueous extract of *Calotropis gigantea.*

CAII**:** Water soluble portion of latex of *Calotropis gigantea.*

The values are presented as average of three reading ± S.D. n = 6 per group.

*p<0.01 as compared with control.

F_{cal} (p<0.01) = 38.48, F_{Tab} (p<0.0l) = 4.10

Indigenous drug systems can be source of variety of new drugs which can provide relief in inflammation. The most widely used primary test to screen new anti-inflammatory agent's measures the ability of a compound to reduce local edema induced in the rat paw by injection of an irritant agent [4] This edema depends on the participation of kinins and polymorphonuclear leukocytes with their proinflammatory factors including prostaglandins [5]. The development of edema in the paw of the rat after the injection of carrageenan has been described as a biphasic event. The initial phase, observed around 1 h, is attributed to the release of histamine and serotonin; the second, accelerating phase of swelling is due to the release of prostaglandin-like substances.[6] The study indicates the potential of these herbal drugs as anti-inflammatory drugs. Such drugs can be explored in various inflammatory diseases. The activity may be attributed to the inhibition of the COX-2 enzyme or inhibition of the activation of transcription factors. It can be concluded that all the extracts have potential to be explored as anti-inflammatory agents.

References

1. Chadha YR. Wealth of India: A Dictionary of Raw Materials and Industrial Product; CSIR, Delhi, India. 1966; 7.
2. Vogel G.H. (Ed.),; Drug Discovery and Evaluation Pharmacological Assays, 2nd edition, Springer- Verlag Berlin Heidelberg, 2002, : 759.
3. Chakraborty, Devi RKB, Rita S. Preliminary Studies on Anti-Inflammatory and Analgesic Activities of Spilanthes Acmella in Experimental Animal Models. Ind. J. Pharmacol. 2004; 36(3**):**148-150.

4. Winter CA, Risley EA, Nuss GW. Carrageenan-Induced Oedema in Hind Paw of Rat as an Assay for Anti-Inflammatory Drugs. Proc.Soc. Exp. Biol. Med., 1962; 111: 544-547.
5. Damas J, Remacle-Volon G, Deflandre E. Further Studies of the Mechanism of Counter Irritation by Turpentine. Arch. Pharmacol. 1986; 332**:**196-200.
6. Beatriz B., Gerado M., Antaonio J. L. and Jose S. E .Anti-inflammatory activity of *Urera baccifera*