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RESEARCH ARTICLE

# Anti-Inflammatory and Toxicity Studies of the Leaves of *Abutilon crispum*

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## ABSTRACT

Natural products serve as lead molecules for development for the many popular drugs. Herbal drugs are having fewer side effects than the other class of drugs which are coming from the synthetic source. *Abutilon crispum* (Linn) Medicust, belonging to family Malvaceae. The present study deals with the anti-inflammatory potential of Abutilon crispum in view to give scientific evidence to the folklore claim on the activity of the leaves. The leaves were collected and extracted using decoction method in water. Indomethacin was used as standard. The above findings indicated that the leaf extract of *A. crispum* possess significant anti-inflammatory activity.

## KEYWORDS

*Abutilon Crispum*, Indomethacin, Anti-Inflammatory, Carrageenan

## INTRODUCTION

*Abutilon crispum* (Linn) belonging to family Malvaceae is trailing perennial, weak, shrub, The plant common distribution in the shady forest undergrowth on hilly slopes. Found in throughout India, It is known as Nelabenda in local area[1]. The plant finds its application in the traditional system of medicine. In India the Plant is used in the treatment of asthma, piles, ulcers, cough, jaundice and diabetics by tribal people of Andhra Pradesh and fruits are used in the treatment of piles in Tamilnadu[2-5]. Since the plant is reported to have many medicinal uses, the author has taken up the plant *A.* crispum to give scientific evidence and so was evaluated for anti-inflammatory activates.

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## MATERIAL AND METHODS

### Plant Material

The fresh leaves (1 kg) of *Abutilon crispum* were collected from Pakala, Narsampet of Warangal district and authenticated by Prof. V. S. Raju, Department of Botany, Kakatiya University, Warangal. A voucher specimen (MRM/03/2012) was deposited in the College of Pharmaceutical Sciences, Andhra University, Visakhapatnam. The collected plant material was dried under shade and coarsely powdered.

### Preparation of the Extract

The aqueous extract of *Abutilon crispum* leaves was obtained by decoction process for 30 min from 500 g of the dried leaves in 1 Liter of water. The filtrate was evaporated in vacuum yielded a brown coloured sticky residue (15.82%w/w). The extract so obtained was suspended in 0.5% w/v sodium carboxy methyl cellulose and used for further studies.

### Acute Toxicity Studies of the Aqueous Extract of *A. crispum*

Acute toxicity of A. crispum was evaluated using standard laboratory model suggested by Seth et al.[6] Adult albino mice of either sex, weighing between 25-33 g were divided into eight groups of six animals each. The control group received 2 ml /kg distilled water orally. The other groups received the extract, at dose levels of 100, 200, 400, 800, 1000, 2000 and 3000 mg/kg in distilled water through oral route. After administration of the dose the animals were observed continuously for first four hours for behavioral changes and for mortality if any at the end of 72 h. However, no mortality was observed.

### Test Animals for the Anti-inflammatory Activity

Adult Wistar Albino rats (150-200g) of either sex were used in the studies. The animals were kept in standard polypropylene cages at room temperature of 30 ± $2^0$C and 60-65 %relative humidity.

### Anti-inflammatory Activity of the Aqueous Extract of *A. crispum*

The test extracts were dissolved or suspended in 0.5% w/v sodium carboxy methyl cellulose in distilled water was assessed in healthy adult albino rats by carrageenan induced hind paw oedema method[7,8] using indomethacin (10 mg/kg), suspended in 0.5 % w/v sodium carboxy methyl cellulose in distilled water as reference drug .The test samples were administered orally to experimental rats 1h prior to injection of carrageenan (0.1 ml of 1%w/v solution) in normal saline in to the sub planter region of left hind paw of each rat. The control paw was injected with an equal volume of saline. All the groups of animals received one of the following through oral route: 0.5%w/v sodium CMC (2 ml/kg), indomethacin (10 mg/kg), aqueous extracts (100 and 200 mg/kg). The paw volume was measured at 0 h, 1 h, 2 h, 4 h and 6 h respectively. The paw swelling was calculated by a plethysmograph as the volume of mercury displaced by the inflamed paw (ml.).

Table 1: Anti-inflammatory activity of the aqueous leaves extract of *A.crispum* on carrageenan induced paw edema in albino rats

| Group | Treatment | Dose | Volume of mercury displaced in ml. | | | | | % protection at 6th h |
|---|---|---|---|---|---|---|---|---|
| | | | 0h | 1h | 2h | 4h | 6h | |
| I | 0.5% w/v Sodium CMC | 2 ml/kg | 0.79 ± 0.046 | 1.13 ± 0.013 | 1.16 ± 0.008 | 1.17 ± 0.013 | 1.31 ± 0.04 | - |
| II | Indomethacin | 10 mg/kg | 0.86 ± 0.05 | 0.81 ± 0.05* | 0.84 ± 0.037* | 0.88 ± 0.02* | 0.92 ± 0.06* | 89.401 |
| III | Aq. extract of *A.crispum* | 100 mg/kg | 0.76 ± 0.027 | 1.0 ± 0.03* | 1.04 ± 0.04* | 0.99 ± 0.027* | 0.96 ± 0.026* | 62.034 |
| IV | Aq. extract of *A.crispum* | 200 mg/kg | 0.95 ± 0.072 | 1.16 ± 0.058* | 1.046 ± 0.03* | 1.02 ± 0.04* | 1.06 ± 0.022* | 89.12 |

Results expressed as Mean ± SEM from six observations *P < 0.001

 

The anti-inflammatory effect was expressed as percent inhibition of oedema. The observations were presented in Table-1, the results are expressed as mean ± S.E.M. Significance of difference between control and treated groups was determined using Student's t-test.

## RESULTS AND DISCUSSION

From the acute toxicity studies, it was observed that the aqueous extract at tested dose levels produced increased urination and marked analgesia. No mortality was observed with the animals even after observation for a period of 72 h.

The results of the present study revealed that the aqueous extract possess significant inhibition of carrageenan induced paw edema at tested dose levels. The percentage inhibition of paw oedema was found to be dose-dependent. The percentage protection with 100 mg/kg and 200 mg/kg at $6^{th}$ h was found to be 62.034% and 89.12% respectively (Standard Indomethacin with 89.401% of inhibition).

## CONCLUSION

Thus the present study justifies its use in the indigenous system of medicine and folklore remedies as anti-inflammatory activity.

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