

## ANTI-INFLAMMATORY ACTIVITY OF THE LEAVES AND BARK OF DELONIX ELATA

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**ABSTRACT:** *Delonix elata* is known to be used for joint pains and in flatulence. It was accidentally observed that local people of some regions using the leaves and bark of *Delonix elata* in inflammation. There was n report on anti-inflammatory activity of *Delonix elata*. Anti-inflammatory activity of the alcoholic extracts of the leaves and bark of *Delonix elata* was found to be significant.

### INTRODUCTION

*Delonix elata* (Syn. *Poinciana elata*) commonly known as white gold mohur (Leguminosae), is used by folklore for joint pains and in flatulence. In Indo-china, the bark is considered as febrifuge and antiperiodic. The leaf and bark in the form of paste is used by local people to reduce inflammation and pain. There is no report on any work done on anti inflammatory activity of the drug. Hence, an attempt has been made to study the anti inflammatory activity of the leaves and bark of the plant.

### MATERIALS AND METHODS

#### Acute toxicity studies

The crude alcoholic extracts of the leaves and bark of *D.elata* were subjected to blind screening in order to detect the pharmacological activities<sup>1</sup> and to find the LD<sub>50</sub> of the extracts in albino mice.

The extracts were suspended in 0.3% sodium carboxy methyl cellulose (Sod.CMC) and the suspension was administered orally to a pair of albino mice

in doses ranging form 100-1000 mg/kg body weight (B.W) The animals were observed for 6 hours at 1,2,3,4 and 6 hours intervals after the administration of the extracts for various activities and later for 5 days for mortality. The extracts within the dose range studied did not alter the behavioral, neurological and autonomic activities of the animals. None of the animals were dead even after 5 days observation indicating that the extracts were relatively non-toxic.

#### Anti-inflammatory studies<sup>2</sup>

Four groups of albino rats A,B,C and D each containing 5 rats were used. Their weights ranged from 52g to 156.5g. Group A served as control. Group B&C were given oral doses of the suspension of leaf and bark extracts of *D.elata*, respectively, (extracts suspended in 0.3% Sod CMC) in a volume of 1 ml/100g body weight. Group D was treated with the suspension of phenylbutazone (50mg/kg BW). All the groups were immediately given tap water orally to a total of 5ml per rat. The above

treatments were given 1 hour before the phlogestic agent carrageenin.

The carrageenin was prepared as 1% solution in sterile saline (0.9%, NaCl) was injected (0.05ml) into the plantar tissue of the right hind paw of the rats through a 26-gauge needle. Immediately the volume of the injected foot was measured using plethysmograph by immersing the paw of the unanaesthetised rat in mercury exactly to an ink mark on the skin over the lateral malleolus. The volume of the foot was again determined 3 hours after the carrageenin treatment by the same mercury displacement method (Plethysmograph).

The oedema volume of the paw for each rat was found by subtracting initial volume from the obtained 3 hours after carrageenin treatment. The mean value of such

differences was calculated for each group. The percentage inhibition of oedema in treated groups was calculated by comparing with the control group. The significance of the oedema reduction produced by each treatment compared to control group was also tested by applying student's t-Test.

## Results and Discussion

The mean oedema volume for each group and the percentage inhibition with the treatment when compared to control are given in table 1. The significance of the treatment compared to control is also indicated in the same table. Both the extracts showed significant anti-inflammatory activity. The validity of the method is checked with a known anti-inflammatory drug phenylbutazone.

**Table 1 : Inhibition of carrageenin induced oedema in rat paw by treatment with different extracts/phenylbutazone (Mean of 5 rats in each group).**

Treatment	Oral dose mg/kg (B.W)	Oedema ml	% inhibition of oedema
Group A (control)	-	0.18	-
Group B (D.E leaf extract)	300	0.10	44
Group C (D.E bark extract)	300	0.04	78
Group D (Phenylbutazone)	50	0.01	94

Carrageenin induced oedema model was a better model to assess anti-inflammatory activity of substances<sup>2</sup>. Hence the same method was adopted in our studies. The paw oedema was measured by using plethysmograph.

Since the LD<sub>50</sub> values of the extracts were more than 100 mg/kg/BW in mice and since the active principles in extracts are present usually in small quantities a dose 300 mg/kg/BW was administered orally in our studies. To assess the validity of the method a known anti-inflammatory agent,

phenylbutazone was also administered orally to one group both phenylbutazone and the extracts of all the plants tested exhibited anti-inflammatory activity as indicated in Table 1. The bark extract of *D.elata* showed slight lower response than phenylbutazone (50 mg/kg/BW). The leaf extract of *D.elata* also showed significant anti-inflammatory action compared to control but it was lower than the effect of bark extract. Compounds like bioflavonoid are reported to produce anti-inflammatory action by decreasing capillary permeability<sup>3</sup>. Steroids are known to produce anti-inflammatory activity<sup>4</sup>. The

extracts tested might contain flavonoids/steriodis which resulted in producing anti-inflammatory activity. Earlier report on the anti-inflammatory activity of the constituents of D.elata flowers supports our results<sup>4</sup>.

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