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# Anti-inflammatory Effect of *Albizzia lebbeck* (Benth.) Bark

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**Abstract:** Successive methanol, water, chloroform and benzene extracts of ***Albizzia lebbeck*** Benth. bark was tested for their phytochemical constituents and anti-inflammatory activity. Methanolic extracts were found to be most effective in most of the ***albino*** rats.

**Key words:** Anti-inflammatory activity, ***Albizzia lebbeck*** Benth

## Introduction

***Albizzia lebbeck*** Benth (Shirish, koroi, siris tree, sizzling treegarso, kalshish) belongs to the family Mimosaceae. Albizzia is unarmed deciduous tree, grows wild and planted in almost all districts of Bangladesh; throughout India, tropical and subtropical Asia and Africa. The tree is 12 to 21 m high, bark is pale. Different parts of the tree are used traditionally for the treatment of diseases. As for example, the root is used in hemicrania, bark as anthelmintic and also for leucoderma, skin diseases, piles, excessive perspiration and bronchitis, leaves are very good for ophthalmia, flowers are given for asthma and snakebite (Kirtikar, 1999)

## Materials and Methods

### Extract used

Methanol extract of ***Albizzia lebbeck*** (AL)was administered at the dose of 200 and 400 mg $kg^{-1}$ (***p.o.***) by suspending the extract in tween 80 (2% w/v) aqueous solution.

### Animal used

Adult albino rats ( Wister strain) 180-200 g were used for this study. The animals were housed in standard metal cages and provided with food and water ***ad libitum***.

### Carrageenin induced rat paw oedema

The effect of methanol extract of AL on carrageenin induced rat paw edema was investigated by the following method (Winter ***et al.***, 1962). 1% solution of carrageenin was prepared. 0.1 ml of this solution was injected in the right hind paw of the rats. The extract (200 mg and 400 mg $kg^{-1}$), phenyl-butazone (100 mg $kg^{-1}$) and control vehicle were injected intraperitonially (I. P.) 30 min. prior to the injection of carrageenin. The paw volume was measured just before and 1, 2, 3, 4, 5 h. after administration of carrageenin by the volume displacement method (Kakali Saha ***et al.***, 1996); using a plethysmometer.

**Mediator induced inflammation**

The anti-inflammatory activity of the extract was measured with some phlogistic agents acted as mediators of inflammation to study the selectivity of the bark extract( Kakali Saha ***et al.***, 1996). 0.1 ml of the solution of histamine base ($10^{-3}$ gm $ml^{-1}$) and serotonin ($10^{-3}$ gm $ml^{-1}$) were injected into the right hind paw and the oedema volume was determined. The extract at the dose of 400 mg $kg^{-1}$ was injected along with the mediator which served as drug treated group and the others injected only with the mediators served as controlled group. The paw volume was measured 30 minutes after injection of the phlogistic agents.

**Chronic test**

The rats were anesthesized and 10 mg of the sterile cotton pellets were inserted one in each axilla of rats. Extracts (200 and 400 mg $kg^{-1}$), phenyl butazone (100 mg $kg^{-1}$) and control vehicle were administered (***ip***) for seven consecutive days starting from the day of cotton pellet implantation. The animal were anesthesized again on the 8th day and cotton pellet were removed surgically, freed from extraneous tissue incubated at $37^0$C for 24 h and dried at $60^0$C to constant weight. Increment in the dry weight of the pellets were taken as a measure for granuloma formation (Kakali Saha ***et al.***, 1996).

**Results and Discussion**

The anti-inflammatory effect of ***Albizzia lebbeck*** against carrageenin induced acute pedal oedema has been shown in Table 1. The extract showed significant anti-inflammatory activity which was comparable to that of phenyl butazone, proto-type of non-steroidal anti-inflammatory agent. Carrageenin induced oedema is commonly used as an experimental animal model of acute inflammation and is believed to be bi-phasic. The first phase is due to release of histamine and serotonin, the second phase is caused by the release of bradykinin, protease, prostaglandin and lysosome. It has been reported that the second phase of the oedema is sensitive to most clinically effective anti-inflammatory agents. Carrageenin rat oedema is a suitable test for evaluating anti-inflammatory drugs which has been frequently used to assess the anti-edematous effect of natural products.

Depending on the above concept the effect of the extract against inflammations produced by histamine, serotonin (Table 2). So it may be suggested that its anti-5HT activity possibly is

Table 1: Effect of Methanol extract of *A. **lebbeck*** on carrageenin induced rat paw inflammation

| Treatment | Dose(mg $kg^{-1}$) | Paw oedema volume in units | Percentage of Inhibition | P-value* |
|---|---|---|---|---|
| Control | -- | 46.9±3.1 | -- | - |
| Methanol Extract | 200 | 32.6±2.5 | 30.5 | <0.01 |
| Methanol Extract | 400 | 24.3±2.3 | 48.2 | <0.001 |
| Phenyl butazone | 100 | 22.8±2.7 | 51.4 | <0.001 |

* P- value was calculated by comparing with control by student's t-test

Table 2: Effect of *A. lebbeck* extract on mediator induced pedal oedema in rats

| Treatment | Paw volume in units | % Inhibition | P-value* |
|---|---|---|---|
| Histamine (Control) | 44.5±1.3 | -- | -- |
| Histamine with extract(400 mg $kg^{-1}$) | 33.2±1.2 | 25.4 | < 0.01 |
| Serotonin (Control) | 42.9±1.8 | -- | - |
| Serotonin with extract(400 mg $kg^{-1}$) | 31.56±2.1 | 26.5 | < 0.01 |
| Dextran (control) | 39.6±1.7 | -- | - |
| Dextran with extract(400 mg $kg^{-1}$) | 28.1±1.9 | 29.0 | < 0.001 |

P- value was calculated by comparing with control by student's t-test

Table 3: Effects of *A. lebbeck* extract on Granuloma pouch in rats (N=10)

| Treatment | Dose(mg $kg^{-1}$) | Weight(mg) | Inhibition(%) | P-value |
|---|---|---|---|---|
| Control | -- | 44.9±1.6 | -- | |
| Extract | 200 | 35.6±1.5 | 20.7 | < 0.05 |
| Extract | 400 | 28.3±1.3 | 36.9 | < 0.001 |
| Phenyl butazone | 100 | 24.8±1.7 | 44.8 | < 0.001 |

responsible for it's anti-inflammatory activity. The extract also reduced the oedema produced by Dextran which is known to be mediated both by histamine and serotonin.

The effect of the extract on granuloma pouch in rats has been shown in Table 3. It was observed that the AL extract significantly inhibited granuloma formation in rats. The AL extract effectively and significantly reduced cotton pellet granuloma suggesting its activity in the proliferative phase of the inflammation process.

The anti-inflammatory activity of AL extract may be due to the presence of small percentage of steroidal compound in it.

## References

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