

## ANTI-INFLAMMATORY POTENTIAL OF THE LEAVES OF *AEGLE MARMELOS* (LINN.) CORREA EX ROXB.

Bedabati Chowdhury Dasgupta

Department of Botany, School of Biological Sciences, University of Science and Technology,  
Meghalaya, Techno City, Baridua-793101. India

Author for correspondence: bedabatidasgupta6@gmail.com

### ABSTRACT

To investigate the anti-inflammatory principles of the methanol extract (MLE) of the leaves of *Aegle marmelos* (Linn.) (Family: Rutaceae) in Brewer's yeast induced peripheral inflammation in rats. Oedema was produced by injecting 0.1ml of 20% (W/V) Brewer's yeast below the planter aponeurosis of the hind paw in rats. Paw volume up to the ankle joint was recorded before and three hours after injection of Brewer's yeast. Plant extract was administered (i.p.) 30 min. before injecting Brewer's yeast. The leaf extract of *Aegle marmelos* (Linn.) significantly reduced oedema ( $0.4 \pm 0.5$  cm) in comparison to the control and the reference drug Dispirin (100mg/Kg, body wt.). The MLE of leaf of *Aegle marmelos* (Linn.) possesses anti-inflammatory effects on peripheral inflammation in rats.

**Keywords:** *Aegle marmelos* (Linn.), anti-inflammatory, Brewer's yeast

### INTRODUCTION

*Aegle marmelos* (Linn.) Correa ex Roxb. (Syn. *Crataeva marmelos* Linn.) commonly known as Boel belongs to the Family Rutaceae. It is a perennial tree, growing wild through the deciduous forests in India, ascending to an altitude of 1200 m. in the western Himalayas. *Aegle marmelos* (Linn.) has been used for ancient times to cure various diseases like diarrhea, migraine, internal abscesses for reducing obesity. The root bark of Boel is one of the ingredients in Dashamuulaarishta, a renowned restorative tonic for women (Khare, 2004). Clinical trials of unripe fruits showed antiviral activity against Ranikhet disease virus and significant results against intestinal parasites, viz. *Ascaris lumbricoides*, *Entamoeba histolytica* & *Giardia lamblia*. Like fruits roots also exhibited anti-amoebic property. The most significant pharmacologically proved properties of *Aegle marmelos* (Linn.) are anthelmintic, antiviral, anti-diarrheal (Beg and Khan 1993) hypoglycemic, cardiac stimulant (Baruah *et al.*, 2007), antidiabetic (Singanan *et al.*, 2007) and can immobilize sperm motility (Sur *et al.*, 2002). Studies by different researchers showed the anti-inflammatory potential of the roots of this plant (Khare 2004). The present study aims to reveal the anti-inflammatory properties of the leaves of *Aegle marmelos* (Linn.) against Brewer's yeast induced pedal inflammation in rats.

### METHODS

#### Extract Preparation

The leaves were collected from the Kamakhya hillside of Guwahati, Assam in the month of April, 2004. After proper identification the leaves were shade dried, powdered and cold extracted with methanol for 96 hours. The yield of the sample was 1.16%. The extract was dried in rotary vacuum evaporator and stored in the refrigerator. The extract was ready for use.

The extract was administered (i.p.) to animals after dissolving it to proper amount of 5% Tween-80.

### Animals

Male albino rats (18 nos., 170-220 g body wt.) were used. Animals were obtained from the animal house of Institute of Advanced Study in Science and Technology, Pachim Baragaon, Guwahati for experimental purpose. They were maintained on a standard normal diet, provided with water ad libitum and maintained at ambient room temperature (25°C ± 2°C). The study was approved by the animal ethics committee and all the ethical norms were strictly followed during the experiment.

### PHARMACOLOGICAL STUDIES

#### Brewer's yeast induced paw oedema in rats:

Paw oedema was induced by a single injection of 20% (W/V) Brewer's yeast (0.1 ml. in 0.9% saline) below the planter aponeurosis of the hind paw in rats (Sharma *et al.*, 2000). Paw volume up to the ankle joint was measured by tying a piece a cotton thread round the rat's paw and noting the point of intersection of two ends on a meter scale. This was taken as an index of paw volume, which is a measured of oedema (Awe *et al.*, 1998). Measurements were taken immediately before and three hours after injection of Brewer's yeast. Control group of the rats received 0.2 ml. of Tween-80 (i.p.), Test group received 300 mg/Kg. of MLE and Reference group received 100 mg/Kg. of Dispirin (i.p.) 30 minutes before yeast injection. All the groups contain 6 animals in each.

The inhibitory activity was calculated according to the following formula

$$\% \text{ Inhibition} = \left\{ \frac{(\text{Ct}-\text{Co}) \text{ Control} - (\text{Ct}-\text{Co}) \text{ Treated}}{(\text{Ct}-\text{Co}) \text{ Control}} \right\} \times 100$$

Ct = Linear paw circumference 3 hours after Brewer's yeast injection

Co = Linear paw circumference 3 hours before Brewer's yeast injection

### Statistical Analysis

Values are expressed as Mean ± SEM and significance of difference of data obtained was evaluated statistically using the Student's t-test (Khan and Khanum, 1994).

### RESULTS

**Table:** Effect of MLE on Brewer's yeast induced paw oedema in rats

GROUP	DOSE (mg/Kg)	Mean increase in paw circumference (c.m.)±S.E.M.	Percent inhibition (%)
Control	Tween-80	1.6 ± 0.09	—
Test	300	1.2 ± 0.53*	25
Reference (Dispirin)	100	0.74 ± 0.33*	53.75

n =6; \*P< 0.001, using Student's t-test

From the table it is clear that the MLE has significant anti-inflammatory activity in Brewer's yeast induced pedal inflammation in rat compared to the Control group and the Reference group, where 300 mg/Kg of the Test drug has reduced inflammation up to 25%.

## DISCUSSION

The choice of yeast as the irritant was based on the rapid production of a large oedematous response and the concomitant development of strong hyperalgesia (Sharma *et al.*, 2000). The present study shows that the MLE from the leaf of *Aegle marmelos* (Linn.) has anti-inflammatory activity against Brewer's yeast induced peripheral inflammation in albino rat. Marmin, a coumarin isolated from the roots, already shows anti-inflammatory effect against carrageen induced inflammation in rats. In this experiment the leaf extract also shows anti-inflammatory activity. This shows the leaf also contains the bioactive components like root that can reduce the inflammation induced by Brewer's yeast.

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