



ANTI-INFLAMMATORY ACTIVITY OF METHANOLIC LEAF EXTRACT OF *DELONIX ELATA* IN COLLAGEN INDUCED MICE

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ABSTRACT

The methanolic leaf extract of *Delonix elata*, were analyzed for anti-inflammatory activity in collagen induced mice. The inflammation was induced by injecting collagen (50 µg/body weight). Group (Group III) of animals were treated with 60 µg per body weight of crude methanolic extract. Mean paw volume and biochemical parameters (SGOT, SGPT and ALP) were analyzed. The levels of SGOT, SGPT and ALP were significantly low in the crude extract of methanolic leaf extract of *Delonix Elata* treated animals than the untreated animals.

Keywords: Anti-inflammatory, methanolic leaf extract of *Delonix Elata* and Biochemical parameters.

INTRODUCTION

Plants are the most vital constituents, for everyday life on earth. Plants have played an important part in the development of mankind. It provided us with food, medicine and cosmetics. Herbal medicine is the oldest form of medicine known to mankind using plants. Herbs have been used by human being, since antiquity for their extra-ordinary leading abilities and pain relieving properties. Presently man has increasingly started using medicinal plants to overcome various illnesses and suffering. Today approximately 75% of all prescription drugs are delivered from trees, shrubs on herbs. Medicinal plants have become a major component of human health care as they have no (or) least side effects. The investigations of the efficiency of plant based drugs used in the traditional medicine have been paid great attention because they elicit meager side effects and are cheap. *Delonix elata* is a deciduous tree about 2.5-15 m tall commonly known as white gold mohur (Vadhanarayana in Tamil), with a spreading, rather rounded crown, crooked poor stem form and drooping branches. Bark smooth, shining; sometimes flaking. A psychosomatic medicinal use relating to scorpion bite treatment is reported from India. The leaf and bark in the form of paste is used by local people to reduce inflammation and pain. The leaves of which are used both internally and for external application in cases of inflammatory joints by applying paste or by taking the expressed juice by local people. Medicated oil prepared from the leaves is marketed under the name of "Vathanarayana". Leaves are used as a folklore remedy for inflammatory joint disorders¹.

MATERIALS AND METHODS

Animals were randomized and divided into four experimental groups (n=6) as follows

Group I: Normal mice with I.V. injection of saline served as control.

Group II: These mice received tail I.V. injection of Chicken Type II Collagen of 50 µg on first day of 7 days treatment.

Group III: These mice were treated with 60 mg/kg body weight of crude methanolic leaf extracts orally and I.V. injection of Chicken Type II Collagen of 50 µg for seven days.

Group IV: These mice were treated with 15 mg/kg body weight of Dichlofenac (Standard drug) orally for seven days.

Mean Paw Volume

The anti-inflammatory effect of methanolic leaf extract of *Delonix elata* was evaluated using Collagen induced Paw oedema in mice. Acute Paw oedema was produced by injecting Collagen 0.5% (W/W) (0.1 ml) into the left hind Paw² of all the groups of animals except control. The *Delonix elata* methanolic leaf extracts 60 mg/kg and Diclofenac sodium (Standard drug) 15 mg/kg administered orally. The Paw volume was measured using Vernier caliper method³ at 7th day after Collagen challenge.

Blood sampling and Biochemical parameters

Blood was collected in heparinised tubes and centrifuged at 2000 × g for 10 min and Biochemical parameters using serum were analyzed.

Estimation of Serum SGOT

SGOT catalyses the transfer of amino group from L-Aspartate to 2-Oxo glutarate with the formation of oxaloacetate and L-glutamate. The rate of this reaction is monitored by an indicator reaction coupled with Malate dehydrogenase (MDH) in which the oxaloacetate formed is converted to malate ion in the presence of NADH Nicotinamide Adenine Dinucleotide). The oxidation of NADH in this reaction is measured as a decrease in the absorbance of NADH at 340 nm, which is proportional to SGOT activity.

Estimation of Serum SGPT

SGPT catalyses the transfer of amino group from L-Alanine to 2-Oxoglutarate with the formation of pyruvate and L-glutamate. The pyruvate so formed is allowed to react with NADH to produce L-lactate. The rate of this reaction is monitored by an indicator reaction coupled with LDH in the presence of NADH (Nicotinamide Adenine Dinucleotide). The oxidation of NADH in this reaction is measured as a decrease in the absorbance of NADH at 340 nm, which is proportional to SGPT activity. The blank, standard and sample was prepared by considering 500 µl of working

reagent and 50 µl each of distilled water, standard and sample respectively. Then all were incubated at 37°C and absorbance was noted at 340 nm.

Estimation of Serum Alkaline Phosphatase

Serum alkaline phosphatase hydrolyses p-Nitro phenyl phosphate in the presence of oxidizing agent Mg^{2+} this reaction is measured as absorbance is proportional to the ALP activity. The above table blank, standard and sample was prepared by considering 500 µl of working reagent and 10 µl each of distilled water, standard, sample respectively, later all the samples were incubated at 37°C and absorbance was recorded at 405 nm.

Estimation of Lipid Peroxidation

The extent of lipid peroxidation in the samples was estimated by thiobarbituric acid reactive substances. To 0.5 mL of the supernatant/ tissue homogenate, 0.5 mL of double distilled water was added and then 2.0 mL of TBA-TCA-HCl reagent was added and mixed well. The mixture was kept in a boiling water bath for 15 min. After cooling, the tubes were centrifuged at 1000 x g for 10 min and the supernatant was estimated. A series of standard solutions in the concentration of 2-10 nmol were treated in a similar manner. The absorbance of the chromophore was read at 535 nm against reagent blank. The values were expressed as mg/dL.

Table 1: Mean paw volume

Groups	Paw Circumference in mm
Group I-Control	39.61±3.02
Group II- Collagen	59.22±4.51
Group III- Crude (60 mg) + Coll (50µg)	43.03±3.28
Group IV- Diclofe (15 mg)	38.89±2.96

Table 2: Biochemical parameters

Groups	SGOT U/ml	SGPT U/ml	ALP U/ml
Group I-Control	54.24±4.13	20.11±1.53	64.61±4.92
Group II- Collagen	99.06±7.54	62.05±4.72	109.13±8.31
Group III- Crude (60 mg) + Coll (50 µg)	85.13±6.48	34.03±2.59	75.03±5.71
Group IV- Diclofe (15 mg)	56.08±4.27	23.88±1.82	65.06±4.95

RESULTS AND DISCUSSION

Table 1 shows the Mean paw volume of animals. The mean paw volume was notably reduced in the (Crude methanolic extract of *Delonix elata*) treated animals.

Table 2 shows the values of Biochemical parameters such as SGOT, SGPT and ALP. The enzyme levels were notably decreased in the (Crude methanolic extract of *Delonix elata*) treated animals.

The inflammation was induced by the injection of Collagen (50 µg/body weight). A group of animals (Group III) were treated with the methanolic leaf extract of *Delonix elata* and were analyzed for anti-inflammatory activity. Biochemical parameters (SGOT, SGPT and ALP) were analyzed. The levels of SGOT, SGPT and ALP were significantly decreased in the (crude extract of methanolic leaf extract of *Delonix elata*) treated animals than the untreated animals. Thus, it can be said that the methanolic leaf extract of *Delonix elata* posses anti-inflammatory activity.

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