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Anti-inflammatory activity of the leaves of *Urena lobata* Linn.

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Abstract

The leaves of *Urena lobata* were subjected to Anti-inflammatory studies by HRBC membrane stabilisation method. It was observed from the findings that the plant possess significant anti-inflammatory activity. The anti-inflammatory activity exhibited by the aqueous extracts of the leaves were concentration dependent, with the increasing concentration the anti-inflammatory activity was also increased.

Keywords: *Urena lobata*, Inflammation, HRBC membrane stabilisation

Introduction

Nature always stands as a golden mark exemplifies the outstanding phenomenon of symbiosis. The biotic and abiotic elements of nature are all interdependent. Nature has provided a complete store house of elements to cure all ailments of mankind¹. Inflammation is defined as the local response to living mammalian tissues to injury due to any agent. It is a body defense reaction in order to eliminate or limit the spread of injurious agent, followed by the removal of necrosed cells and tissues².

Urena lobata is an annual or perennial erect under shrub from Malvaceae family. It grows well in almost all states of India. The plant is traditionally used for a variety of diseases like malaria, gonorrhoea, leucorrhoea, fever and cold³. In the present study an attempt has been carried out to screen the aqueous extract of the leaves of the plant for its anti-inflammatory activity.

Source of the plant

The leaves were collected from the hilly areas of Pariyaram medical college campus in the month of March and the same was authenticated by Dr.A.K.Pradeep, Asst. Professor, Department of Botany, University of Calicut. It was then shade dried and a specimen of bearing voucher no. UL (L) 01/18 has been deposited in the Department of Pharmacognosy, Academy of Pharmaceutical Sciences, Pariyaram Medical College, Kannur District, Kerala State, and South India.



Fig.1. *Urena lobata* showing flowers

Preparation of aqueous extract

The dried and powdered leaves (500 g) were macerated with chloroform water (1:99) for seven days. The extract was filtered and concentrated in vacuo to syrupy consistency and dried in vacuum desiccator.

Anti-inflammatory Studies

The HRBC membrane stabilization has been used as a method to study the anti-inflammatory activity. Blood was collected from healthy volunteers and then it was mixed with equal volume of sterilized Alsever solution. The blood was then subjected to centrifugation (at about 4000-5000 rpm) and packed cells were washed with isosaline and a 10% v/v suspension was made with isosaline. The assay mixture contains the drug at various concentration, 1 ml

phosphate buffer, 2 ml of hyposaline and 0.5 ml of HRBC suspension. Diclofenac sodium was used as the reference drug. Instead of hyposaline 2 ml of distilled water was used in the control. All the assay mixtures were incubated at 37°C for 30 min and centrifuged. The haemoglobin content in the supernatant solution was estimated by using spectrophotometer at 560 nm. The percentage hemolysis was calculated by assuming the hemolysis produced in the presence of distilled water as 100 %. The percentage of HRBC membrane stabilization or protection was calculated by using the formula;⁴

$$\text{Percentage Protection} = 100 - (\text{OD sample} / \text{OD Control}) \times 100$$

*OD=Optical Density

Table.1 Anti-inflammatory evaluation of the leaves of *Urena lobata*

Sl.No.	Concentration in mg/ml	Evaluation of Anti-inflammatory activity	
		Aqueous extract of <i>Urena lobata</i>	Diclofenac sodium (Standard)
1	Control
2	250	54.7 ± 0.02	77.16 ± 0.03
3	300	63.8 ± 0.08	81.06 ± 0.09
4	350	75.3 ± 0.01	90.22 ± 0.04
5	400	89.8 ± 0.06	101.37 ± 0.05
6	450	93.6 ± 0.07	124.99 ± 0.09
7	500	111.39 ± 0.09	131.55 ± 0.01

* Values are expressed as SEM of 3 readings

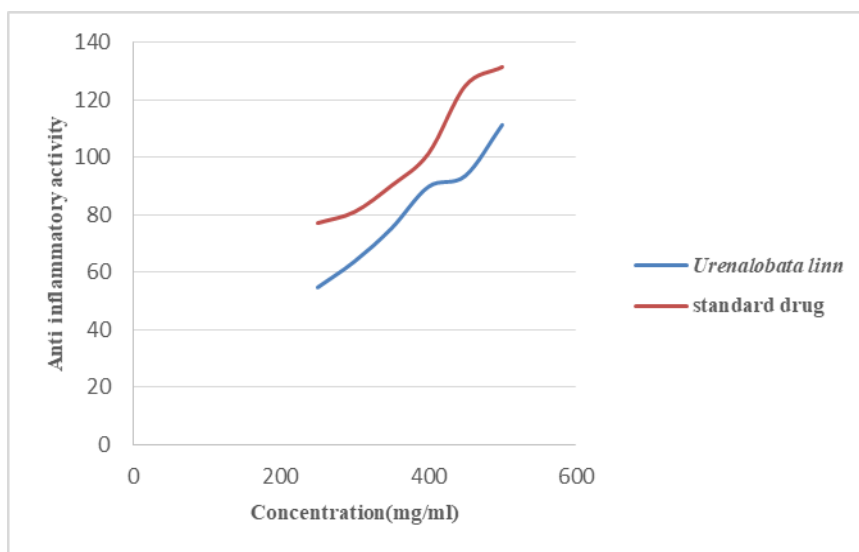


Fig.2.Anti-inflammatory activity of the leaves of *Urena lobata*

Results

The aqueous extract of the leaves of *Urena lobata* were subjected to erythrocyte membrane stabilization induced haemolysis by hypotonic solution. The inhibition of hypotonicity induced HRBC membrane lysis was taken as a measure of the anti-inflammatory activity⁵. It was observed from the study that (Table 1 and Figure 2) the aqueous extract of *Urena lobata* shows significant anti-inflammatory activity at the concentration of 500 micro gram/ml (111.39±0.09).The anti-inflammatory effect was comparable with the diclofenac sodium,(131.55±0.01) which was used as the standard drug during the evaluation. It was also observed that the anti-inflammatory activity of the extract was concentration dependent during the evaluation.

Discussion

Medicinal plants have been a source of wide variety of biologically active compounds for many centuries and used extensively as crude material or as pure compounds for treating various disease conditions⁶.Phytochemical screening of the leaves of *Urena lobata* have already reported that it contain alkaloids, flavonoids, saponins, tannins and phenolic compounds⁷. Alkaloids and flavonoids are well known for their ability to inhibit pain perception⁸. Further Jose M. Barbosa-Filho et.al. have already reported the mechanism of action of alkaloids isolated from plant origin. In addition Permender Rathee et.al reported the mechanism of action of flavonoids as an anti-inflammatory agent. Since the leaves of *Urena lobata*

are endowed with flavonoids and alkaloids the possible anti-inflammatory activity of the plant could be due to these phytoconstituents.

Since most of the synthetic anti-inflammatory drugs have reported with gastric irritation as one of the major side effect, it is necessary to find out an alternative therapy in this regard. Further the compound isolation, purification and characterization of these constituents which is responsible for the anti-inflammatory activity, has to be evaluated for the usage of *Urena lobata* as an anti-inflammatory agent.

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Conflict of Interest: Nil

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