

**TO EVALUATE THE ANTI-INFLAMMATORY ACTIVITY OF
PROSOPISJULIFLORA ETHANOL EXTRACT IN EGG ALBUMIN INDUCED PAW
EDEMA IN RAT**

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ABSTRACT

Plants are used as a major source for medicine as they found to possess a reservoir of chemical agents and biological active compounds. Extracts of *Prosopisjuliflora* seeds and leaves have several in vitro pharmacological effects such as antibacterial, antifungal, anti-inflammatory properties. A plant which is rich in Alkaloid, Flavonoids, Tannins, Anthraquinones and Quinon are responsible for inhibition of H⁺. In the current work the plant *Prosopisjuliflora* components have been explored as a potentially effective and safer anti-inflammatory compound. Twenty four Wistar rats were randomly allotted to four groups (6 animals per group) Group 1 was treated with water for Injection (10 ml/kg b. w). Group 2 was treated with single oral dose of Ibuprofen (100 mg/kg b. w dissolved in water for Injection). Groups 3 and 4 were treated with ethanol extract of *Prosopisjuliflora* (250 and 500 mg/kg b. w. respectively). The standard drug Ibuprofen at 100 mg/kg and Ethanol extract of *Prosopisjuliflora* at 250 and 500 mg/kg significantly reduced the paw volume and edema volume at 0, 1, 2, 3 and 4 hours after inflammatory induction.

Keywords: Anti-inflammatory, *Prosopisjuliflora*, Ethanol extract.

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INTRODUCTION

Finding healing powers in plants is ancient idea. Plants are used as a major source for medicine as they found to possess a reservoir of chemical agents (Mishra N., *et. al.*, 2010). World Health Organization (WHO) has reported that more than 80 % of the world's population relies on the traditional medicine for their primary healthcare because of the plant kingdom represents enormous biologically active compounds. Knowledge on the plant phytochemistry provides a fundamental use of plants as a reservoir of chemical agents in the field of medicine (Ajayi IA, *et. al.*, 2011).

The tropical *Prosopis juliflora* have been distributed around the world over the last 200 years and are now widespread in dry parts including India (Pasicznik *et al.*, 2001). *Prosopis juliflora*, a member of family Leguminosae, is found in arid and semi-arid regions of Karnataka. A number of compounds have also been reported from this plant, the most common of these being steroids, tannins and leucoanthocyanidin. Extracts of *Prosopis juliflora* seeds and leaves have several *in vitro* pharmacological effects such as antibacterial, antifungal, anti-inflammatory properties (Al Shakh Hamed, W. M. A, *et. al.*, 1999, Kanthasamy, A, *et. al.*, 1989a, Ahmad, A. *et. al.*, 1989a, Nwafor PA. *et. al.*, 2007).

Inflammation is a local response of living mammalian tissues to injury. It is a body defense reaction in order to eliminate or limit the spread of injurious agent. There are various components to an inflammatory reaction that can contribute to the associated symptoms and tissue injury (Nitin Bhatt. *et. al.*, 2010). Oedema

formation, leukocyte infiltration and granuloma formation represent such

components of inflammation [Mitchell RNet. *al.*, 2000]. Hence, the present study was undertaken to evaluate the anti-inflammatory activity of ethanolic extract of *Prosopis juliflora*.

MATERIALS & METHODS: TEST PROCEDURE AND OBSERVATIONS

Anti-inflammatory activity was assessed by the method described by Winter *et al.*, (1962).

1. Twenty four Wistar rats of either sex were randomly allotted into four groups (6 per group). Group 1 was treated with Water for Injection, 10 ml/kg b.w. and served as vehicle control. Group 2 was administered with single oral dose of Ibuprofen, 100 mg/kg b.w. and served as positive control. Groups 3 and 4 were administered with single oral dose of Ethanol extract of *Prosopis juliflora* 250 and 500 mg/kg b.w., respectively.
2. Right hind Paw size of each rat was measured before induction of inflammation and was considered as base line (0 hr reading). Inflammation was induced in rats by sub plantar injection of 0.1 ml of fresh egg-albumin into the right hind paw.
3. The paw size was measured after induction of inflammation and at 1, 2, 3, and 4 hrs.
4. Edema volume will be calculated by deducting 0 hour paw size each hour paw size.
5. Data were analyzed using one - way ANOVA followed by suitable post hoc test. P values < 0.001 will be considered as significant in comparison to control.

Husbandry Conditions

Temperature: 20±3°C

Humidity: 30-70 %

Light: 12 hours light and 12 hours dark cycle

Air changes: 12-15 changes per hour

RESULTS AND DISCUSSION

Twenty four Wistar rats of either sex were randomly allotted into four groups (6 per group). The Study design of anti-inflammatory activity of *Prosopisjuliflora* ethanol extract in egg albumin induced paw edema in rat is shown in Table 1. And Formulation Details of dose conc. is shown in Table 2. Group 1 was treated with Water for Injection, 10 ml/kg b.w. and served as vehicle control. Group 2 was administered with single oral dose of Ibuprofen, 100 mg/kg b.w. and served as positive control. Groups 3 and 4 were administered with single oral dose of Ethanol extract of *Prosopisjuliflora* 250 and 500 mg/kg b.w., respectively. Right hind Paw size of each rat was measured before induction of inflammation and was considered as base line (0 hr reading). Inflammation was induced in rats by sub plantar injection of 0.1 ml of fresh egg-albumin into the right hind paw. The paw size was measured after induction of inflammation and at 1, 2, 3, and 4 hrs. Edema volume will be

calculated by deducting 0 hour paw size each hour paw size.

The standard drug Ibuprofen at 100 mg/kg and Ethanol extract of *Prosopisjuliflora* at 250 and 500 mg/kg significantly reduced the paw volume and edema volume at 0, 1, 2, 3 and 4 hours after inflammatory induction. The reduced paw and edema volume at 0 to 4 hours data is shown in Table 3 and graphical representation is shown in Graph 1. And individual animal Inflammation Measurement of G1, G2, G3, G4 is shown in Table 4.

Data were analysed using one - way ANOVA followed by suitable post hoc test. P values <0.001 will be considered as significant in comparison to control.

CONCLUSION

The present investigation reveals the ethanolic extract of *Prosopisjuliflora* seeds and leaves explore many bioactive compounds having pharmacological importance like Alkaloid, Flavonoids, Tannins, Anthraquinones and Quinon. The bioactive compounds were evaluated for anti-inflammatory activity and found to be very efficient effect by reduced the paw volume and edema value at 0,1,2,3 and 4 hours after inflammation. The effective drug may be formulated by *Prosopisjuliflora* as efficient anti-inflammatory agent.

Table 1: Study design of anti-inflammatory activity of *Prosopisjuliflora* ethanol extract in egg albumin induced paw edema in rat.

Group No.	Treatment	Dose (mg/kg)	Concentration (mg/ml)	Quantity of test item (mg)	Volume of Vehicle
G1	Distilled water	0	0	0	20
G2	Ibuprofen (p.o.)	100	10	200	20
G3	Ethanol extract of <i>Prosopisjuliflora</i>	250	25	500	20
G4	Ethanol extract of <i>Prosopisjuliflora</i>	500	50	1000	20

Table 2: Formulation Details of anti-inflammatory activity of *Prosopisjuliflora* ethanol extract in egg albumin induced paw edema in rat.

Groups	Treatment	Dose (mg/kg)	No. of animals	Animal No.
G1	Water For Injection	0 (10 ml/kg)	6	1-6
G2	Ibuprofen	100	6	7-12
G3	Ethanol extract of <i>ProsopisJuliflora</i>	250	6	13-18
G4	Ethanol extract of <i>ProsopisJuliflora</i>	500	6	19-24

Table 3: Effect of *Prosopis juliflora* ethanol extract on Paw Size and Edema volume in egg albumin induced paw edema in rat

Treatment groups (Dose)	Paw Volume					Edema Volume			
	0 hr	1 hr	2hr	3 hr	4 hr	1 hr	2 hr	3 hr	4 hr
G1 Water for Injection (10 ml/kg)	2.57 ± 0.06	3.97 ± 0.08	3.87 ± 0.06	3.72 ± 0.08	3.65 ± 0.07	1.4 ± 0.05	1.3 ± 0.06	1.15 ± 0.06	1.08 ± 0.04
G2 Ibuprofen (100 mg/kg)	2.63 ± 0.07	3.00 ± 0.05***	2.95 ± 0.07***	3.05 ± 0.09***	2.98 ± 0.07***	0.37 ± 0.04***	0.32 ± 0.05***	0.42 ± 0.03***	0.35 ± 0.03***
G3 Ethanol extract of <i>Prosopis Juliflora</i> (250 mg/kg)	2.67 ± 0.08	3.32 ± 0.07***	3.25 ± 0.11**	3.3 ± 0.09***	3.2 ± 0.06***	0.65 ± 0.03***	0.58 ± 0.06***	0.63 ± 0.03***	0.53 ± 0.06***
G4 Ethanol extract of <i>Prosopis Juliflora</i> (500 mg/kg)	2.58 ± 0.05	3.02 ± 0.07***	3.03 ± 0.06***	3 ± 0.07***	3.05 ± 0.07***	0.43 ± 0.08***	0.45 ± 0.09***	0.42 ± 0.03***	0.47 ± 0.04***

Statistically significant when compared to control group (p<0.05)

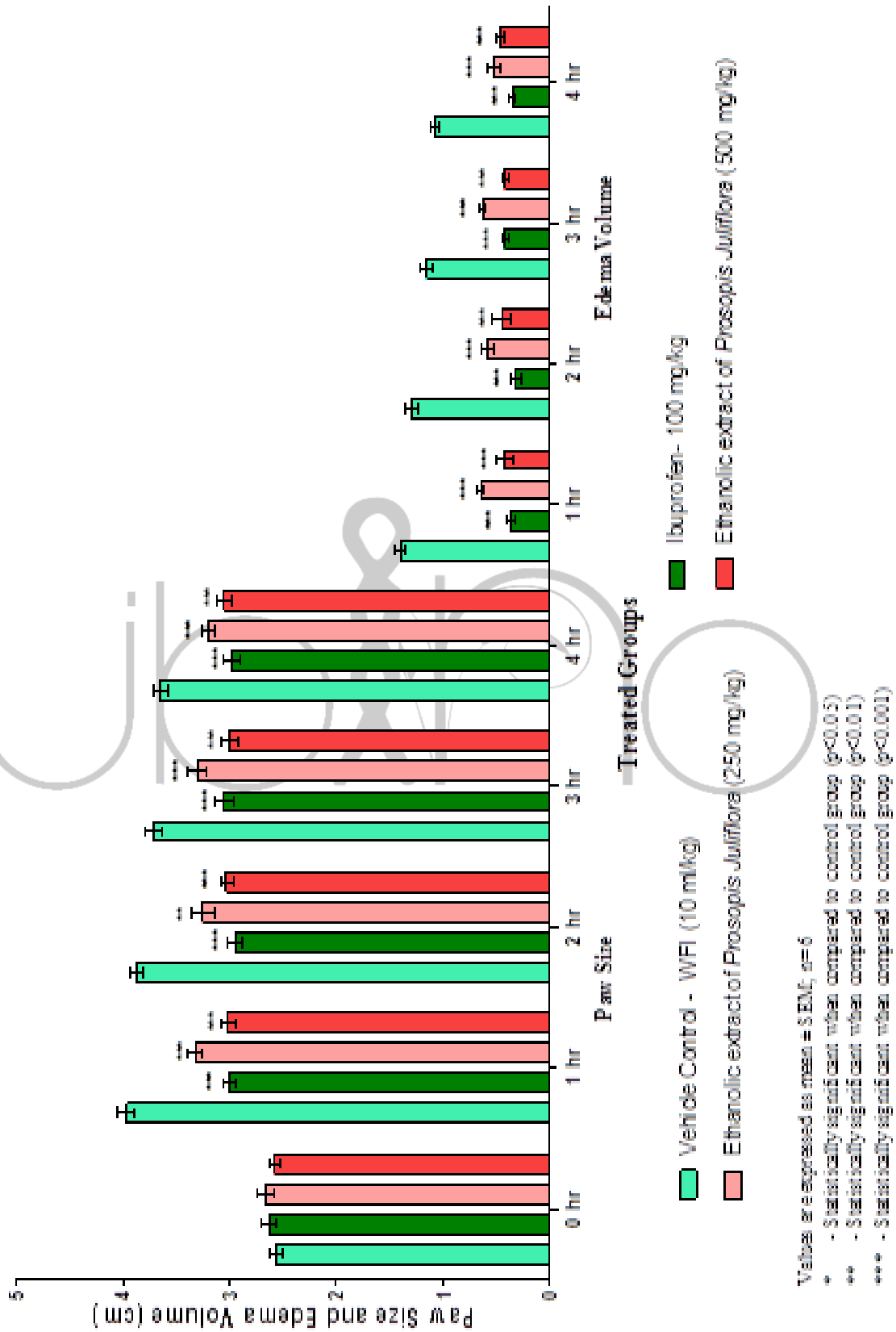
** Statistically significant when compared to control group (p<0.01)

*** Statistically significant when compared to control group (p<0.00)

Table 4: Individual Animal Inflammation Measurement

Group No.	Animal No.	Body weight (g)	Paw Size (cm)					Edema Volume (cm)			
			0 min	1 hr	2 hr	3 hr	4 hr	1 hr	2 hr	3 hr	4 hr
G1 Water for Injection (10 ml/kg)	1	190.07	2.4	3.7	3.6	3.4	3.4	1.3	1.2	1	1
	2	189.08	2.5	3.8	4	3.7	3.7	1.3	1.5	1.2	1.2
	3	179.1	2.6	3.9	3.8	3.6	3.7	1.3	1.2	1	1.1
	4	194.88	2.5	4.1	3.9	3.8	3.5	1.6	1.4	1.3	1
	5	166.37	2.8	4.2	3.9	3.9	3.8	1.4	1.1	1.1	1
	6	182.11	2.6	4.1	4	3.9	3.8	1.5	1.4	1.3	1.2
G2 Ibuprofen (100 mg/kg)	7	186.38	2.5	2.9	2.8	2.8	2.8	0.4	0.3	0.3	0.3
	8	177.38	2.7	3	2.9	3.1	3	0.3	0.2	0.4	0.3
	9	179.92	2.5	2.9	2.8	2.9	2.8	0.4	0.3	0.4	0.3
	10	168.78	2.9	3.1	3.1	3.4	3.2	0.2	0.2	0.5	0.3
	11	193.77	2.5	2.9	2.9	2.9	2.9	0.4	0.4	0.4	0.4
	12	176.16	2.7	3.2	3.2	3.2	3.2	0.5	0.5	0.5	0.5
G3 Ethanol extract of <i>Prosopis Juliflora</i> (250 mg/kg)	13	169.71	2.4	3.1	3	3.1	3	0.7	0.6	0.7	0.6
	14	198.83	2.7	3.4	3.2	3.3	3.2	0.7	0.5	0.6	0.5
	15	177.3	2.7	3.2	3.4	3.4	3.2	0.5	0.7	0.7	0.5
	16	192.04	3	3.6	3.5	3.6	3.3	0.6	0.5	0.6	0.3
	17	197.97	2.7	3.4	3.5	3.4	3.4	0.7	0.8	0.7	0.7
	18	183.89	2.5	3.2	2.9	3	3.1	0.7	0.4	0.5	0.6
Ethanol extract of <i>Prosois Juliflora</i> (500 mg/kg)	19	183.8	2.8	3	2.9	3.2	3.2	0.2	0.1	0.4	0.4
	20	184.39	2.6	2.9	3.1	3.1	3.2	0.3	0.5	0.5	0.6
	21	183.02	2.6	3	2.9	3	3.1	0.4	0.3	0.4	0.5
	22	166.27	2.5	3.3	3.2	2.8	2.8	0.8	0.7	0.3	0.3
	23	199.26	2.6	3.1	3.2	3.1	3.1	0.5	0.6	0.5	0.5
	24	167.24	2.4	2.8	2.9	2.8	2.9	0.4	0.5	0.4	0.5

Graph: 1. Effect of *Prosopis juliflora* ethanolic extract on Paw Size and Edema volume in egg albumin induced paw edema in rat



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