

Antimicrobial and antiinflammatory activities of various extracts of the leaves of *Jatropha tanjorensis*

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ABSTRACT

The Hexane, chloroform and methanol extracts of the leaves of *Jatropha tanjorensis* were evaluated for its antimicrobial activity against staphylococcus aureus, Bacillus subtilis, Escherichia coli and Pseudomonas Aeruginosa and anti inflammatory activity against carrageenin induced hind paw oedema in rats. All the extracts exhibited varying degree of antibacterial activity and anti inflammatory activity. Among these extracts, the methanolic extract exhibited significant antimicrobial activity comparable to the standard drug ciprofloxacin and also antiinflammatory activity by decreasing paw volume of oedema in rats.

Key words: Antimicrobial & antiinflammatory, *Jatropha tanjorensis*.

INTRODUCTION

Species of *Jatropha* belonging to the family of Euphorbiaceae are found distributed in the tropical region. Most of them are generally grown as hedge species and contain sticky, opalescent, acrid and astringent latex, which promote healing of wounds, refractory ulcer, septic gums and as styptic in cuts and bruises¹. Of the 9 species in Tamil nadu ² *Jatropha Tangorensis* is a shrub or small tree found in pondichery mainly in tangore district. Even though there are no scientific studies carried out on *Jatropha Tangorensis*, it has got a wide variety of activities like Anti-inflammatory, anticancer, antileprosy, antibacterial effect. So the present study is to evaluate its Phytochemical profile, Anti-inflammatory and antibacterial activity.

MATERIAL AND METHODS

The Leaves of the plant was collected from local areas of pondicherry in Tamilnadu and was identified by a taxonomist Dr.M. B.Viswanathan

MSU Nellai. The leaves of the plant were dried in shade and pulverized to get a coarse powder.

The air dried powder was extracted ^{3,4} with Hexane, chloroform and methanol by continuous hot percolation method using soxhlet apparatus. The extracts were concentrated to dry mass by using vacuum distillation. After drying the extracts were collected and stored in a closed vessel.

Phytochemical studies

The solvent extracts were tested for preliminary phytochemical screening ^{5,6} and the plant constituents were isolated and purified by chromatographic techniques.

Anti microbial activity

The Antimicrobial activity of the crude extracts was performed by Agar cup plat method.⁷ The extracts were dissolved separately in DMSO at a conc of (30 mg/ml). ciprofloxacin (1 mg/ml) in DMSO was used as reference standard for the antibacterial study solvent control (only DMSO) was

also maintained through out the experiment. The selected micro organisms include staphylococcus aureus, Escherichia coli, pseudomonas aeruginosa and bacillus subtilis respectively. The results are depicted in Table 1 and Fig. 1

Anti Inflammatory Activity

The anti-inflammatory activity of hexane and chloroform and methanol extracts of jatropha tanjorensis was evaluated in wistar Rats of either sex weighing between 180-220g using carrageenan induced rat paw oedema method⁶. The animals were fed with standard Laboratory feed and provided water ad libitum. Rats were divided 5 groups of 6 animals each. All the extracts were dissolved in carboxy methylcellulose administered intraperitoneally. The first group of animals received the standard drug (Diclofenac sodium) second group of animals received the control, third, fourth, fifth received Hexane, chloroform, methanolic extract respectively half an hour prior to carragenan challenge (0.1ml 1% w/v solution was injected in to

the subplantar region of left paw of the rat to produce inflammation). oedema volumes were measured by using plethysmograph at ½ hr, 1hr, 2hr, and 3hr intervals. Average odema volume and percentage reduction in oedema volume are given in Table 2.

RESULTS AND DISCUSSION

The preliminary phytochemical studies of different extracts show the presence of phyosterols, carbohydrate Tannins, phenolic opds, gums and mucilage and saponins. The results of antimicrobial activity revealed that all the extracts exhibited varying degree of antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*, *Pseudomonas Aeruginosa*, *Bacillus subtilis*. However the chloroform extract exhibited highest activity than all other extracts under similar conditions.

The studies on anti inflammatory activity showed significant anti inflammatory activity ($p < 0.01$) level which was comparable with that of

Table 1

Extract /Antibiotic	Conc.(µg/ml)	Diameter of the zone of inhibition(mm)			
		<i>S.aureus</i>	<i>B.subtilis</i>	<i>E. coli</i>	<i>Paeruginosa</i>
Hexane extract	30	1	1	1	2
	60	2	2	2	3
Chloroform Extract	30	6	1	5	1
	60	10	2	9	2
Methanolic Extract	30	2	1	3	2
	60	3	3	5	3
Ciprofloxacin	30	10	10	09	11
	60	13	15	12	14

Table 2

Treatment	After Drug administration Paw Volume (ml) (Mean ± SEM)					% reduction at 3 hr
	0 min	30 min	60 min	120 min	180 min	
Control	1.206±0.12	1.562±0.22	1.622±0.06	1.722±0.04	1.836±0.02	-
Diclofenac sodium	1.198±0.08	1.12±0.24	0.98±0.24	0.92±0.22	0.82±0.08	55.34
Hexane Extract	1.203±0.08	1.48±0.10	1.42±0.06	1.40±0.08	1.38±0.07	24.84
Chloroform Extract	1.204±0.02	1.45±0.08	1.38±0.14	1.34±0.12	1.20±0.04*	34.64
Methanolic Extract	1.202±0.06	1.34±0.12	1.26±0.08	1.20±0.06	1.02±0.08*	44.44

dilofenac sodim $P < 0.01$. where as the petroleum ether extract did not show much significant activity when compared to standard. The percentage protection of the extracts is shown in the table 2.

The inflammation is a response of the tissue to an infection, irritation or foreign substances. A variety of chemical agents like histamine (1 mg/ml), carrageenan (1% w/v dextran 60mg/ml have been used to induce oedema in the feet of rodents.

Anti inflammatory activity of an extract can be determined by their ability to reduce or prevent oedema.⁹ The development of carrageenan – induced edema is Biphasic, the first phase in attributed to the release of histamine, S-hydroxytryptamine and kinins, while the second phase is related to the release of prostaglandins. The plant has direct or indirect action over this and that was the result of its anti-inflammatory action.

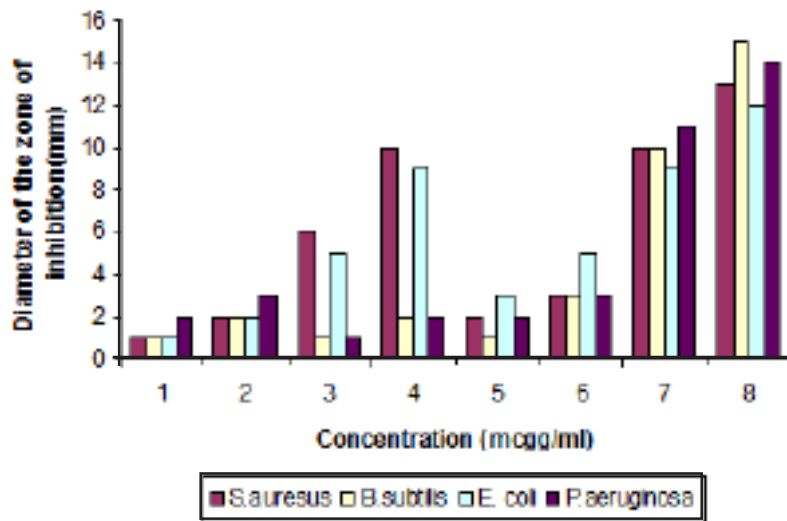


Fig. 1: Antimicrobial activity of *Jatropha tanjorensis*

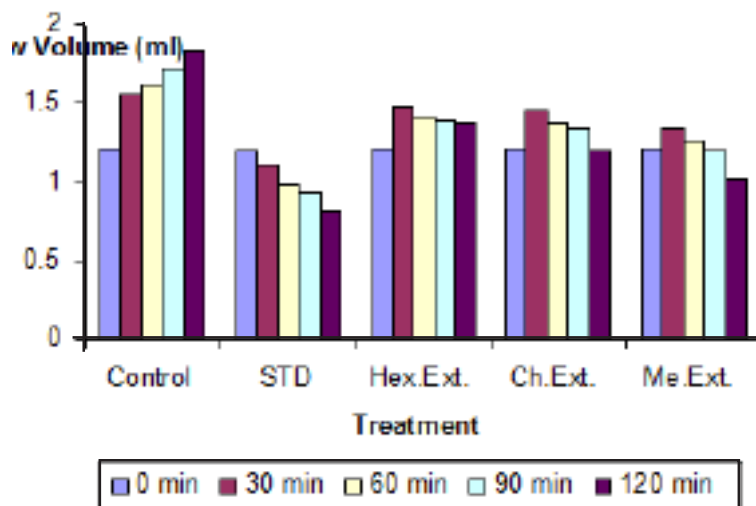


Fig. 2: Antiinflammatory activity of *Jatropha tanjorensis*

CONCLUSION

The present study concluded that the plant *Jatropha tanjorensis* is selected for antibacterial and anti-inflammatory activity

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