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Anti-Inflammatory Activity of *Tylophora indica* in Albino Rats

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Abstract: The objective of present study is to investigate the anti-inflammatory effect of *Tylophora indica* on Carrageenin induced hind paw oedema and cotton pellet granuloma in Albino rats. Hind paw oedema was produced by sub plantar injection of Carrageenin and paw volume was measured by plethysmometrically at 0 and 3 h intervals after injection. Cotton pellet granuloma was produced by implantation of 50±1 mg, sterile cotton in each axilla under ether anaesthesia. The animals were treated with *Tylophora indica* and Indomethacin. *Tylophora indica* produced significant anti-inflammatory effect in both acute and sub-acute models of inflammation was more effective when compared to Indomethacin. Thus *Tylophora indica* possess anti-inflammatory effects in both acute and sub-acute inflammation.

Key words: *Tylophora indica*, hind paw oedema, Indomethacin

Introduction

Medicinal importance of *Tylophora indica* is used as folk remedy in certain region of India for the treatment of Bronchial asthma (Bielory and Lupoli, 1999), inflammation, bronchitis, allergies, Rheumatism and Dermatitis (Gupta and Bal, 1956; Dhananjayan *et al.*, 1974; Mathew and Shivpuri, 1974), but the scientific data on their anti-inflammatory activity are not available in Carrageenin induced paw oedema model. Hence, in the present study the anti-inflammatory effect of these extract was investigated.

Materials and Methods

Plant Material

The plant *Tylophora indica* was collected from Trichirapalli district, Tamilnadu, India. The plant was authenticated by the botanical survey of India, Coimbatore, Tamilnadu, India.

The aerial plant was dried in shade, pulverized by a mechanical grinder and passed through a 40 mesh sieve to get the coarse powder and stored in an airtight container.

Chemical and Reagents

The chemicals used in the present study were Carrageenin and Indomethacin (sigma. UK)

Preparation of Extract

The aerial Part of the plant material was extracted with ethanol in a Soxhlet extraction apparatus. The extract at the different doses of 100, 200 and 400 mg kg⁻¹ was suspended in aqueous Tween 80 (2%) solution and Indomethacin (10 mg kg⁻¹) in saline were used for the present study.

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Animals

Albino wistar strain rats of either sex, weighing between 130-150 g were used. They were kept on standardized diet and water *ad libitum*.

Acute Inflammation

Acute inflammation was produced by sub plantar injection of 0.1 mL of 1% suspension of Carrageenin in the normal right hind paw of rats (Winter *et al.*, 1962). Paw volume was measured by plethysmometrically by the method of Chattopadhyay *et al.* (1986) and Di Rosa *et al.* (1971), at 0 and 3 h after injection. The animals were treated with *Tylophora indica* (100, 200 and 400 mg kg⁻¹, p.o.), saline (3 mL kg⁻¹, p.o.) treated animals were served as control and Indomethacin (10 mg kg⁻¹ p.o.) (Badilla *et al.*, 1999) was administered as standard drug.

The animals were pretreated with the extract 30 min before the administration of Carrageenin injection. Mean increase in paw volume was measured and percentage of inhibition was calculated.

Sub-acute Inflammation

Sub-acute inflammation was produced by cotton pellet induced granuloma in rats (Winter CA and Porten CC, 1957).

Sterile cotton (50±1 mg) soaked in 0.2 mL of distilled water containing penicillin (0.1 mg) and streptomycin (0.13 mg) was implanted subcutaneously, bilaterally in axilla under ether anaesthesia. The animals were treated with *Tylophora indica* (100, 200 and 400 mg kg⁻¹, p.o.) for consecutive 6 days. Saline (3 mL kg⁻¹, p.o.) treated animals served as control and Indomethacin (10 mg kg⁻¹, p.o.) was administered as standard drug. The animals were scarified on the 7th day. The granulation tissue with cotton pellet was dried at 60°C overnight and then dried weight was taken. The weight of the cotton pellet before implantation is subtracted from the weight of the dried, dissected pellets. (Winter, *et al.*, 1962).

Statistical Analysis

The experimental results were expressed as the mean±SEM Data were assessed by the method of analysis of ANOVA followed by student's t-test. p-values of < 0.05 were considered as statistically significant.

Results

The ethanolic extract of *Tylophora indica* was evaluated for anti-inflammatory activity in acute and sub-acute experimental animal model and the results are tabulated in the Table 1 and 2. The ethanolic extract exhibited significant anti-inflammatory activity at the administrated dose of 100, 200 and 400 mg kg⁻¹ in a dose dependent manner.

Table 1: Effect of ethanolic extract of *Tylophora indica* on carrageenin induced rat paw oedema.

Treatment	Dose (kg ⁻¹)	Mean increase in paw volume (mL)	Inhibition of paw oedema (%)
Control	3 mL	0.84±0.02	
Indomethacin	10 mg	0.30±0.03	64.28
<i>Tylophora indica</i>	100 mg	0.51±0.01	39.28
	200 mg	0.43±0.02	48.80
	400 mg	0.33±0.03	60.00

Values are mean±SEM, n = 6 animals in each group *p<0.01 when compared to control

Table 2: Effect of ethanolic extract of *Tylophora indica* on cotton pellet granuloma

Treatment	Dose (kg ⁻¹)	Weight of dry cotton pellet granuloma (mg)	Inhibition of paw oedema (%)
Control	3 mL	69.00±4.20	
Indomethacin	10 mg	21.00±3.10	69.50
<i>Tylophora indica</i>	100 mg	32.00±6.05	53.62
	200 mg	26.00±4.30	62.31
	400 mg	22.00±3.32	68.11

Discussion

The ethanolic extract was evaluated for its anti-inflammatory activity in acute and sub-acute models investigation suggest that *Tylophora indica* have significant anti-inflammatory effect against Carrageenin induced paw oedema and cotton pellet induced granuloma in rats. In Carrageenin induced oedema. The effects of *Tylophora indica* extract were found to be less potent than Indomethacin. In cotton pellet induced granuloma the effect of *Tylophora indica* extract were found to be equal when compared to the standard drug (Indomethacin). If the present investigation as ethanolic extract are effective in both acute and sub-acute models of inflammation.

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