

ANTI-INFLAMMATORY ACTIVITY OF SOLANUM NIGRUM AND SOLANUM TUBEROSUM IN ALBINO RATS.

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Two indigenous drugs viz. *Solanum nigrum*, (Solanaceae) and *Solanum tuberosum* (Solanaceae) were collected in East Godavari District, Andhra Pradesh. The former is used as local application for ulcers, sores, wounds and in rheumatism (Wealth Of India 1959). The latter is said to be useful in chronic rheumatism (Kirtikar *et al* 1954). But the scientific data on their anti-inflammatory activity is not available. Hence in the present study the anti-inflammatory effect of these indigenous drugs were investigated.

Wistar strain rats of either sex, weighing between 120 – 150 g were used. They were kept on standardized diet and water *ad libitum*.

Dried leaves of *S. nigrum* and *S.tuberosum* (each of 500 g) were taken and extracted. About 53 g *S. nigrum* and about 62.5 g *S.tuberosum* was obtained. Suspensions of these powders with 2% gum acacia were prepared and used. The animals were divided into eight groups and in each group ten animals were kept.

Acute inflammation was produced by subplantar injection of 0.1ml of 1% suspension of carrageenin in normal saline in the right hind paw of the rats (Winter *et al* 1962). Paw volume was measured plethysmometrically by the method of Chattopadhyay *et al* (1986) at '0' and '3' h after carrageenin injection. The animals were treated with *S. nigrum* (20 mg kg⁻¹ orally), and *S. tuberosum* (10 mg kg⁻¹ orally). Saline (3 ml kg⁻¹, orally) was administered as standard drug. The drugs were administered simultaneously with carrageenin injection. Mean increase in paw volume was measured and percentage of inhibition was calculated.

Subacute inflammation was produced by cotton pellet induced granuloma in rats (Winter and Porter 1957; Turner 1965). Sterile cotton (50 ± 1 mg) soaked in 0.2 ml of distilled water

containing pencillin (0.1mg) and streptomycin (0.13mg) was implanted subcutaneously bilaterally in axilla under ether anaesthesia. The animals were treated with *Solanum nigrum* (20mg kg⁻¹, orally) and *S.tuberosum* (10mg kg⁻¹ orally) for consecutive six days. Saline (3ml kg⁻¹, orally) treated animals served as control and phenylbutazone (100 mg kg⁻¹, orally) was administered as standard drug. The animals were slaughtered on the seventh day. The granulation tissue with cotton pellet was dried at 60° C overnight and then the dry weight was taken. The weight of the cotton pellet before implantation was subtracted from the weight of the dried, dissected pellets.

Statistical analysis was done by unpaired student's 't' test. P values <0.05 were considered significant.

In acute inflammation model, the carrageenin induced paw oedema was significantly reduced by all the drugs when compared to control (Table 1).

In the model of subacute inflammation, the weight of the granulation tissue was significantly reduced by treatment with *S.nigrum*, *S.tuberosum* and phenylbutazone when compared to control (Table 2).

The results of the present investigation suggest that *S.nigrum* and *S.tuberosum* have significant anti-inflammatory effect in carrageenin induced paw oedema and in cotton pellet induced granuloma in rats. In carrageenin induced paw oedema the effect of *S.tuberosum* was higher than that of acetylsalicylic acid. In cotton pellet induced granuloma, the two indigenous drugs were found to be less potent than phenylbutazone. Carrageenin induced hind paw oedema and cotton pellet induced granuloma are the two standard experimental models of acute and subacute inflammation respectively. In the present investigation, as the test drugs are effective in both models of inflammation, there is a possibility that these may be effective in acute and chronic inflammation.

Table 1

Effect of test drugs and standard drug on carrageenin induced rat paw oedema

Treatment	Dose kg ⁻¹ (ml)	Mean increase in paw volume (ml)	Percentage inhibition of paw oedema
Control	3	0.5 ± 0.03	
<i>S.nigrum</i>	20	0.25 ± 0.02	49.65*
<i>S.tuberosum</i>	10	0.23 ± 0.01	57.10*
Acetyl Salicylic acid	100	0.26 ± 0.01	53.06*

Values are mean ± SEM; n=10 animals in each group. *p<0.01 when compared to control.

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Table 2
Effect of test drugs and standard drug on subacute inflammatory model in rat

Treatment	Dose kg ⁻¹ (ml)	Mean increase in paw volume (ml)	Percentage inhibition of paw oedema
Control	3	78.00 ± 5.10	
<i>S.nigrum</i>	20	36.10 ± 2.15	55.79**
<i>S.tuberosum</i>	10	29.75 ± 7.05	56.61**
Acetyl Salicylic acid	100	23.63 ± 4.29	65.45**

Values are mean ± SEM; n=10 animals in each group. *p<0.01 when compared to control.

Key words: *Solanum nigrum*, *Solanum tuberosum*, Anti-inflammatory activity.

References

Chatopadhyay R N, Chatopadhyay R, Roy S, Moitra SK

1986 A simple method for plethysmometric measurement of paw volume of small laboratory animals in evaluation of anti-inflammatory effects. *Bull Calcutta School Trop Med* **34** 5-8.

Kirtikar J D, Basu B D 1994 *Indian Medicinal Plants* Published by Lalit Mohan Basu; Leader Road, Allahabad, India, Vol 3, 2nd ed pp2120.

The Wealth of India 1959. Publication and Information Directorate CSIR, New Delhi. Vol 5, pp 29.

Turner R A 1965 *Screening Methods in Pharmacology*. New York Academic press, 2nd ed pp158.

Winter C A, Porter C C 1957 Effect of alteration in side chain upon anti-inflammatory and liver glycogen activities of hydrocortisone ester. *J Am Pharma Ass Sci* **46** 515-519

Winter C A, Risley E A, Nuss G W 1962 Carrageenin-induced oedema in hind paw of the rats as an assay for anti-inflammatory drugs. *Proc Soc Exp Biol Med* **111** 544- 547