HYGEIA
JOURNAL FOR DRUGS AND MEDICINES
www.hygeiajournal.com

ANTI-INFLAMMATORY ACTIVITY OF SEED AND FRUIT WALL EXTRACT OF *SOLANUM TORVUM*

M. Rammohan[1] and C.Srinivas Reddy[1]*

1, 1* .Vaagdevi College of Pharmacy, Kishanpura, Hanamkonda, Warangal 506001, AP, India,

Abstract

The present study is aimed to evaluate the seed and fruit wall methanol extracts of *Solanum torvum* for anti-inflammatory activity by Carrageenan induced rat paw edema method by using plethysmometer.all text extracts show significant anti-inflammatory activity, among them seed methanol 500 mg / kg body weight exhibited superior activity. The anti-inflammatory activity of extract may be presence of flavonoids, sterols and saponins.

Keywords: *Solanum torvum,* Methanol, Diclofenac sodium, Anti-inflammatory activity

1. Introduction

Inflammation is a non-specific, defensive response of the body to tissue damage The inflammatory response mobilizes the body's defenses, isolates and destroys microorganisms and other injurious agents and removes foreign materials and damaged cells so that tissue repair can proceed . A variety of chemical agents like histamine (1mg/ml), Carrageenan (1%w/v) and dextran (60mg/ml) have been used to induce edema in the feet of rodents. Anti-inflammatory activity of an extract can be determined by their ability to reduce or prevent edema. *Solanum torvum (Solanaceae) popularly know as* Sundaikai, Kodusonde in India, is used in Ayurveda and Unani systems of medicine to treat various diseases. The powdered seeds mixed with mustarded oil are used as massage oil for treating skin eruptions.

For correspondence: challa_cnu@yahoo.com
Contact: +91 9000716969, +91 870 2455111,
Fax: +91 870 2460108

The fumes of burning seeds are inhaled for toothache and the roots are used in the form of a poultice to promote healing of cracks in the feet and anti microbial agent [1, 3 and 4]. Since the anti-inflammatory activity of this plant has not been scientifically evaluated, the present study was undertaken to investigate the effect of methanol extracts of seeds and fruit wall of *Solanum torvum* for its anti-inflammatory activity

2. MATERIALS AND METHODS

2.1. Plant material

The Fruits of *Solanum torvum*. (Solanaceae) were collected in November and December 2007 from Thirumala Thirupathi (A.P), India. The plant parts are identified by Dr. Madhavashetty, Taxanomist, Dept of Botany, S.V University, Thirupathi, India and authenticated by comparing with the voucher specimen.

2.2. *Extraction*

The Seed, fruit wall are separated, dried and powdered and macerated with methanol for 2 days to afford a greenish brown semisolid mass (Seed methanol extract; yield: 6.76% w/w on dried wt, Fruit wall methanol extract; yield:7.12% w/w on dried wt,).

2.3. *Preliminary phytochemical studies*

Preliminary qualitative phytochemical analysis of Seed methanol extract and Fruit wall methanol extract indicated the presence of spirostanol glycosides, isoflavanoids, alkaloids, tannins and carbohydrates.

2.4. Animals

Wistar rats of either sex, weighing 180-240 gm purchased from NIN, Hyderabad were used. They were housed in standard environmental conditions of temperature, humidity, light and provided with standard rodent food and water *ad libitum*

2.5 Acute toxicity study

Healthy adult albino mice of either sex, starved over night, were divided into groups (n=6) and were orally fed with increasing doses (250, 500, 750 and 1000 mg/kg body weight) of methanol extracts. The total extracts administered orally in doses up to 1000mg/kg. Animals were observed during first 2hr for gross behavioral changes and once in 30min for next 4hrs and then once in 24hr for next 72hrs to find out percentage mortality.

2.6 Evaluation of Anti-inflammatory Activity

The Wistar rats were divided into six groups of six animals each. Group I served as control and received normal saline orally. Group II served as positive control and received Diclofenac sodium (100 mg/kg).

Group III and IV received Seed methanol extract, orally at a dose of 250 and500 mg/kg respectively. Group V and VI received Fruit wall extract, orally at a dose of 250 and 500 mg/kg respectively.

A mark was made on both the hind paws just beyond the tibiotarsal junction, so that every time the paw is dipped in the mercury column up to the marked level to ensure constant paw volume. After 1 hr of administration of the test and standard samples, 0.1 ml of 1% Carrageenan suspension (in normal saline) was injected into dorsal region of sub plantar surface of hind paw of rat subcutaneously with the help of 26 G needle. The initial paw volume of each rat was recorded before drug administration. The paw volumes were measured at the end of 0.5, 1, 2, 3 and 4 hrs using plethysmometer. Any change in paw volume of rats was obtained by subtracting initial paw volume from the paw volumes at different time intervals. The average value of edema was calculated by taking the average of each group at different hours. Percentage inhibition of edema was calculated for each group with respect to its control group.

$$\text{Percentage(\%) inhibition} = (A - B) \times 100/A$$

Where A is the mean increase paw volume in rats treated with control and B is the mean increase in paw volume in rats treated with test drug. [2, 8]

3. Statistical analysis

All the results are reported as Mean ± SEM Statistical significance was analyzed employing, one way ANOVA. *P*-values of 0.05 or less were taken as significant.

4. Results and discussion

The results obtained in this investigation indicate that the percentage protection against edema formation with all extracts was significant. The anti-inflammatory activity was found to be dose dependent up to 3 hrs in case of standard and extracts, followed by a decrease in either case.

From the table it can be observed that the standard drug diclofenac sodium has protected to an extent of 21, 41, 55, 70 and 56% against inflammation induced by Carrageenan at ½, 1, 2, 3 and 4 hrs. Seed methanolic extract at 500 mg ⁄ kg body weight has shown activity comparable to that of diclofenac sodium (100 mg ⁄ kg body weight). This extract has produced more protection then the other extracts and it is less then that of standard.

5. Conclusion:

Seed methanolic extract at 500 mg ⁄ kg body weight has shown maximum activity comparable to other extracts.

Acknowledgements

Authors wish to acknowledge Viswambhara Educational Society and the management, Warangal and, Vaagdevi College of Pharmacy, Warangal (A.P) for the infrastructural facilities and moral support.

Table 1.Effect of Seed and fruit wall extracts of *Solanum torvum* on carrageenan induced at paw edema.

Treatment	Dose mg/kg	*MEAN EDEMA VOLUME(ml) and %protection 30 min	1st hr	2nd hr	3rd hr	4th hr
Control	-	0.38±0.02	0.65 ±0.003	0.94±0.043	1.14±0.02	0.92±0.001
Standard	100	0.30 ± 0.03 (21)%	0.38±0.009 (41)%	0.42±0.05 (55)%	0.34± 0.02 (70)%	0.40 ± 0.03 (56)%
	250	0.34 ± 0.02 (10)%	0.52 ± 0.06 (20)%	0.68±0.01 (27)%	0.50 ± 0.02 (56)%	0.61 ± 0.04 (33)%
Seed methanol						
	500	0.30± 0.02 (21)%	0.49 ± 0.03 (24.6)%	0.52±0.02 (44)%	**0.40 ± 0.03 (65)%**	0.48 ± 0.03 (48)%
	250	0.36± 0.02 (5)%	0.56± 0.01 (16)%	0.70±0.01 (25)%	0.52 ± 0.02 (54)%	0.59 ±0.05 (35)%
Fruit wall Methanol	500	0.32 ± 0.02 (15.7)%	0.45± 0.02 (30)%	0.51±0.02 (45)%	0.44 ± 0.02 (61)%	0.52 ± 0.02 (43)%

* Edema volume (mean ± SEM)

Table.2 Maximum percentage protection

Treatment	Dose mg/kg	Maximum percentage protection	P value
Control	-	-	N.S
Standard	100	70	P<0.001
Seed methanol	250	56	P<0.001
	500	65	P<0.01
Fruit wall Methanol	250	54	P<0.001
	500	61	P<0.01

References

1. Parotta JA, Healing plants of peninsular India, CABI publishing, London, 2001, 89-90.
2. Turner RA, screening methods in Pharmacology, Academic press, 1971.210-245
3. DumrongkietArthan, PrasatKittakoop, AsimEsen, Jisnuson Svasti, Daraporn), Anti viral iso flavanoid sulphate and steroidal glycosides from Solanum torvum, Phytochemistry, 59: 2002, 459-463**.**

4. Chah. K.F., Muko. K.N. and Oboegbulem, S.I. Anti microbial activity of methanolic extract of Solanum torvum, Fitoterapia, (7): 2000, 187-189.
5. E. O. Ajaiyeoba (),Comparative phytochemical and Anti microbial studies of Solanum macrocarpum and Solanum torvum, Fitoterapia, (70):1999,184-186
6. Joshi S.D,Kulkari V.D (2006) Journal of natural remedies 6/2 135-140
7. Hukkeri V.I and Savadi R.V), Anti inflammatory activity of leaves of Acacia farneosiana, Indian drugs, 39(12): 2002, 664-666.
8. Handa. S.S, Chawla.A.S, Sharma.A.K. (), Plants with Anti inflammatory activity, Fitoterapia, 63(1). 1992.
9. S.Moses Soundaraaj V.Alagarsamy, G.Senthil Kumar et al Anti inflammatory and Anti microbial activity of Vitex negunda leaf extracts, Indian drugs, 36(12):1999, 756-758.
10. Joy. B.Mathew S.W. and Gopi T.V Anti inflammatory activity effect of seed oils of some Annona species Indian drugs, 41(10): (2004), 636-638.