Chandran A and Arunachalam G. / *International Journal of Phytopharmacology.* 4(4), 2013, 263-265.

e- ISSN 0975 – 9328
Print ISSN 2229 – 7472

International Journal of Phytopharmacology

Journal homepage: www.onlineijp.com

IJP

STUDY OF ANTI-INFLAMMATORY ACTIVITY OF *SCAEVOLA TACCADA* ROXB LEAF EXTRACTS

A.Chandran* and [1]G.Arunachalam

[*]Department of Biotechnology, Periyar Maniammai University, Thanjavur, Tamilnadu, India.
[1]PGP College of Pharmaceutical Science and Research Institute, Namakkal, Tamilnadu, India.

ABSTRACT

In the present investigation preliminary phytochemical screening leaves extract of *Scaevola taccada* revealed the presence of alkaloids, flavonoids, lipids, terpenoids, glycosides and saponins. The anti-inflammatory activity of leaves extracts of *Scaevola taccada* were evaluated using the carrageenan induced paw edema method in rats. The rats were evaluated for the paw edema volume at a different interval of time up to 3hr. The ethanolic extract 400mg/kg shows a moderate activity at 180 min (9.33±1.33) while aqueous extract 400mg/kg shows a significant activity at 180 min (8.66±1.2). The results support the traditional use of this plant in some painful and inflammatory conditions.

Key words: *Scaevola taccada*, Anti-inflammatory activity, Aqueous and ethanolic extracts.

INTRODUCTION

Scaevola taccada Roxb belongs to the family Goodeniaceae, in vernacular language it is known as vellamuttagam, found in sea coasts of all around India and in the Andaman Islands. The ethnopharmacology of the leaves revealed the uses of digestive, carminative, antitumour and anti-inflammatory properties. Fruit juice internally used to induce menstruation. The roots are used for dysentery. A decoction of the leaves and the bark was reported to combat tachycardia, one of the principal symptoms of beriberi. The drug reduces the frequency of heart beat, slow down the pulse rate and stimulates the heart for normal contraction. It exhibits diuretic property by increasing the tension in the renal arteries without causing irritation of the kidney parenchyma and is used for dropsy. The phytochemical studies of aerial part of the plant revealed the presence of loganin, sylvestroside-III, dimethyl acetal, cantleyoside and its dimethyl acetal compounds (Khare CP, 2007).

Scaevola taccada Roxb is a spreading freely branching shrub with thick stems, up to 3m in height. Leaves opposite, short-petiolate, fleshy, glossy, light-green, obovate, variable in size, but usually about 15 cm long and 5 cm wide. Flowers are white, zygomorphic, moderate sized, 5-lobed, borne on few flowered axillary inflorescences. Fruit a white juicy, globose drupe containing 1-2 seeds (Gient Colonel Heber Drury, 1982; Kirtikar KR, Basu BD, 1998; Gamble JS, 2004).

Plant is reported to have Chemical constituents of scaevolin, chlorogenicacid, saponins, glycosides, lipids (seeds), alkaloids. Liquid from the leaves is used to treat weakness after childbirth which leads to pneumonia. The roots are used to treat stomachache. A decoction of the bark and leaves is used to treat a relapse after an illness. The juice from the bark is used in treating ringworm. The roots are used to treat beri-beri, syphilis and dysentery. Parts of the plant are used to treat coughs, tuberculosis and stings from the stingray (Narayan Das Prajapati *et al*., 2003).

Scaevola species have been used in various traditional medicines. They are usually prepared in decoction form. However some are used as an application on the surface. Different parts of the plant are used to treat various illness, diseases or wounds. The crushed fruit of S*caevola taccada* has been used by early settlers to treat tinea. It is said that the leaves were taken when having indigestion. They are also used in a poultice to cure

Corresponding Author

A. Chandran
Email: chand292006@yahoo.co.in

headache. In addition there are also reports indicating the use of leaf decoction and the flesh of the seeds as a contraceptive. The juice from ripe fruit has been used to treat sores and infected eyes whereas a combination of juices from ripe fruit and stem has been used as a remedy for bites and stings. This plant has also been used as a dermatological aid in Hawaii. A mixture of pounded root bark with salt is used for cut and skin diseases. In Indonesia the root is used as an antidote when poisonous fish and crabs are consumed (Michele Mejin, 2009).

Based on the above information the present study was carried out to evaluate the anti-inflammatory activity of the leaves of *Scaevola taccada* in an experimental animal model using rats.

MATERIALS AND METHODS

Preparation of the plant extract

The leaves of the plant were dried under shade at 27-30°C for 30 days and the plant material was grounded into coarse powder**.** The powder was extracted with ethanol by continuous hot using soxhlet apparatus. The extract was filtered, concentrated and dried under reduced pressure using a rotary evaporator.

Preliminary Phytochemical Screening

Scaevola taccada Extract was subjected to Preliminary phytochemical screening followed by standard methods showed the presence of alkaloids, flavonoids, glycosides, terpenoids, lipids and saponins (Harborne JB, 1998; Kokate CK *et al*., 2007).

Screening of anti-inflammatory activity

Carrageenan induced paw oedema in rats

Albino Wistar rats of either sex weighing 150-200 gms were divided into six groups of six animals each. The dose of the drugs administered to the different groups was as follows and all the drugs were administered orally. Group I: received vehicle (1ml of distilled water) and Served as negative control; Group II: Served as standard (Indomethacin 10 mg/ kg, p.o); Group III & IV Received ethanolic extract of *Scaevola taccada* (EST 200 & 400 mg /kg, p.o); Group V& VI: received aqueous extract of *Scaevola taccada* (AST 200& 400 mg/kg, p.o) respectively

After one hour of the administration of the drugs, groups were injected 0.1 ml of 1% w/v carrageenan solution in normal saline was injected into the subplantar tissue of the right hind paw of the rat and left hind hind paw served as control. The paw volume was measured by the mercury plethysmograph at 0 min, 60 min, 120 min and 180 min after the carrageenan injection (Kulkarni SK *et al*., 2005; Neto AG *et al*., 2005).

Statistical analysis

Data was expressed as mean±standard error of means. Statistical analysis was made by using the difference between experimental groups was compared by one-way analysis of variance (ANOVA) followed by Newman-Keuls test.

RESULTS

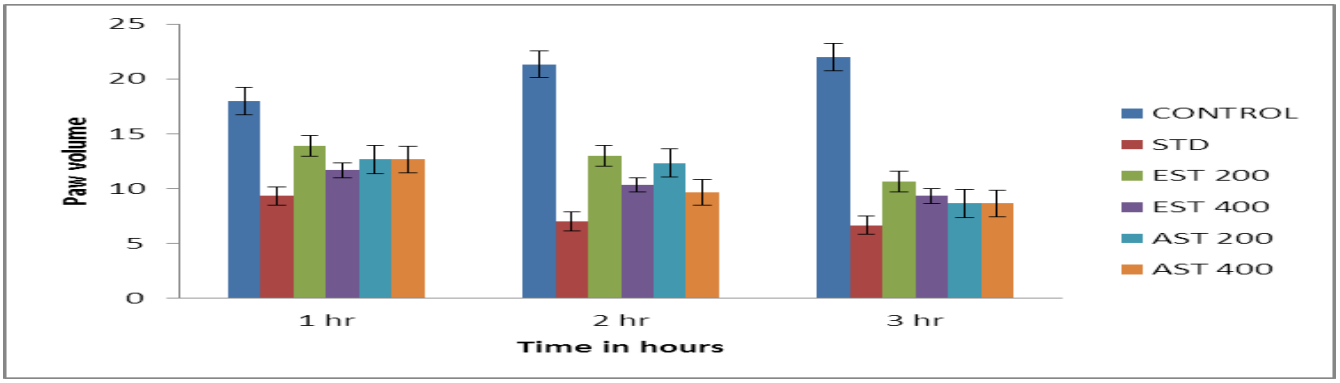
Phytochemical screening of the ethanolic and aqueous extract of *Scaevola taccada* leaves revealed the presence of alkaloids, flavonoids, glycosides, terpenoids, lipids and saponins. The anti-inflammatory effect of the extract on carrageenan-induced oedema right hind paw volume in rats is depicted in Table.1. There was a gradual increase in the oedema paw volume in the distilled water treated control group throughout the period of the experiment. The extract at 200 and 400 mg/kg body weight as well as indomethacin significantly reduced the oedema paw volume in a manner that was not dose dependent. There was also substantial inhibition against the oedema induced paw volume in the extract and drug treated animals. The injection of carrageenan to the left hind paw volume of the negative control increased significantly throughout the 3 h experimental period. In contrast, the extract at 200 and 400 mg/kg body weight reduced the carrageenan induced right hind paw volume in a manner that was not dose-dependent. The indomethacin treated (positive control) animals produced the highest inhibition of carrageenan induced paw oedema.

Table 1. Effect of *Scaevola taccada* extracts in Carrageenan induced paw oedema in rats

Group	Treatment	Paw volume (ml)		
		1 hr	2 hr	3 hr
I	Negative Control (1ml of distilled water)	18+1.00	21.33±2.07	22±3.05
II	Standard (Indomethacin 10 mg/ kg, p.o)	9.33±0.33***	7±0.57**	6.66±0.88**
III	EST 200mg/kg, p.o	13.87±0.15*	13±0.57	10.66±0.88
IV	EST 400mg/kg, p.o	11.66±1.20**	10.33±1.76**	9.33±1.33**
V	AST 200mg/kg, p.o	12.66±0.33*	12.33±2.72*	8.66±1.45**
VI	AST 400mg/kg, p.o	12.66±0.88*	9.66±1.85**	8.66±1.2**

All values were expressed as mean±S.E.M of six rats at each group. Values are statistically significant at P<0.001***; P<0.01**; P<0.05*

Figure 1. Effect of *Scaevola taccada* extracts in Carrageenan induced paw oedema in rats



DISCUSSION & CONCLUSION

The carrageenan-induced paw edema in rats is known well established animal model to assess the anti-inflammatory effect of natural products as well as synthetic chemical compounds. Edema formation due to carrageenan in paw is a biphasic event, during the initial phase (1h or 1.5h) is predominately a non-pathogenic edema followed by second phase (2-3hr) with increased edema formation (Das S and Kanodia L, 2005).

The initial phase has been induced due to the action of mediators such as histamine, serotonin and bradykinin on vascular permeability. The second phase edema has been shown to be the result of over production of prostaglandins (Saivasanthi V *et al*., 2011). The result of pre-treatment of extracts demonstrated that the extract is effective in the early phase of inflammation up to 3hr of the experiment. Extracts showed significant activity against in both phases. These activities may be due, in part, to the presence of phytochemicals such as flavonoids or terpenoids (Gupta Mradu *et al*., 2013).

REFERENCES

Das S, Kanodia L. Comparative study of anti-inflammatory activities of whole plant and fruit extracts of *fragaria vesca* in experimental animal models. *Journal of Natural Pharmaceuticals*, 2(1), 2005, 20-23.

Gamble JS. Flora of the presidency of Madras. Vol II, Bishen Singh Mahendra Pal Singh publishers, Dharadun, 2004, pp.733-734.

Gient Colonel Heber Drury. Hand book of Indian flora.Vol II, Bishen Singh Mahendra Pal Singh publishers, Dharadun, 1982, pp. 99.

Gupta Mradu, Banerjee Dalia, Mukherjee Arup, Studies of Anti-inflammatory, Anti-pyretic and Analgesic effects of aqueous extract of traditional herbal drug on rodents. *Int Res J Pharm*, 4(3), 2013, 113-120.

Harborne JB. A Guide to modern techniques of plant analysis. Edn 2, Kluwar academic publishers, USA, 1998, pp.85.

Khare CP. Indian medicinal plant an illustrated dictionary. Springer, New Delhi, 2007, pp. 588.

Kirtikar KR, Basu BD. Indian medicinal plants. Edn 2,Vol II, Bishen Singh Mahendra Pal Singh publishers, Dharadun, 1998, pp.1449-1450.

Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. Edn 39, Nirali Prakashan, Pune, 2007, pp.108-109.

Kulkarni SK. Handbook of Experimental Pharmacology. Vallabh prakashan, 2005, pp.128-130.

Michele Mejin. Isolation, Structural elucidation and antibacterial activity of the chemical constituents of *Scaevola spinescens*, The university of Adelaide, 2009, pp. 6

Narayan Das Prajapati, Purohit SS, Arun Sharma K, Tarun Kumar. A Hand Book of Medicinal Plants, A Complete Source Book. Edn 1, Agrobios, Jodhpur, 2003, pp 463.

Neto AG, Costa JMLC, Belati CC, Vinh´olis AHC, Possebom LS, Da Silva Filho AA, Cunha WR, Carvalho JCT, Bastos JK, Silva MLA, Analgesic and anti-inflammatory activity of a crude root extract of *Pfaffia glomerata* (Spreng) Pedersen *Journal of Ethnopharmacology*, 96, 2005, 87–91.

Saivasanthi V, Gowthamigoud, Swathi K, Aakruthi, Sowmya rani, Gupta A, Rao AS. Evaluation of *caralluma fimbrita* for analgesic,anti-inflammatory and anxiolytic activities. *Int J Pharma*, 1(1), 2011, 40-45.

How to cite this article:
Chandran A and Arunachalam G. Study of anti-inflammatory activity of *Scaevola taccada* Roxb leaf Extracts. *Int J Phytopharmacol*. 4(4), 2013, 263-265.