



NOTE

Antiinflammatory Activity of Aqueous Bark Extract of *Butea monosperma* (Lam.) Taub.

VINOD NAUTIYAL^{1,*}, ASHWANI KUMAR¹, SOMESH THAPLIYAL² and KAPIL KUMAR GOEL¹

¹Department of Pharmaceutical Sciences, Gurukul Kangri Vishwavidyalaya, Haridwar-249 404, India

²Department of Pharmaceutical Science, H.N.B. Garhwal University, Srinagar-246 174, India

*Corresponding author: E-mail: vinodnautiyaal@gmail.com

(Received: 11 August 2010;

Accepted: 30 May 2011)

AJC-10006

Butea monosperma is used in the traditional system of medicine for treating inflammation, tumors, diabetes anticonvulsant, antidiarrhoeal, etc. Present study emphasizes its efficacy against inflammation. The bark was collected from its natural habitat care was taken to select healthy plant for normal bark. Aqueous bark extract of *Plaso monosperma* was tested to study the effect on the inflammation using the technique of carrageenan induced paw edema in the abino rats. It is concluded that aqueous bark extract showed significant antiinflammatory activity compare to the reference standard indomethacin. It was found that the aqueous bark extract (200 mg/kg) showed significant activity ($p < 0.001$) at 2 and 3 h when compared to standard but it has been found that the dose of 200 mg/kg aqueous bark extract showed good activity as compare to dose of 100 mg/kg aqueous bark extract.

Key Words: Antiinflammatory activity, *Butea monosperma* (Lam.) Taub.

Butea monosperma is a species of *Butea* native to tropical southern Asia. It is a medium sized dry season-deciduous tree, growing to 15 m tall. The leaves are pinnate, with an 8-16 cm petiole and three leaflets, each leaflet 10-20 cm long. The flowers are 2.5 cm long, bright orange-red and produced in racemes up to 15 cm long. The fruit is a pod 15-20 cm long and 4-5 cm broad¹⁻³.

The species of *Butea* found in India include *Butea monosperma*, *B. Parviflora*, *B. minor* and *B. subperba*. The species of *Butea monosperma* is commonly known as bark, palas, bastard teak, flame of forest and Bengal keno tree. This beautiful tree is a native of mountainous districts of India and Burma and now grows wild through out India. All parts of the plant have been used but the bark is of particular interest from a medicinal point of view as an appetizer, lessens inflammation biliousness, dysmenorrhoea, used in liver disorder, fractures, tumors, diabetes and ulcer. *Butea monosperma* has also reported as antiinfertility³, anthelmintic⁴, antiasthematic⁴, antispermatogenic effect, antioestrogenic⁵, anticonvulsant^{6,7}, antidiarrhoeal and hypoglycemic activity. Flavonoids and their glycoside, nitrogenous compounds, fatty acids, sterols and triterpenoids are reported from *Butea monoaperma* bark⁸⁻¹⁰.

The bark was collected from valley of Narendra Nagar of Uttarakhnad. The species for the proposed study was identified as *Plaso monosperma* (Lam.). The bark was collected by peeling method where the tree was cut at the base and bark was peeled

out. First of all the bark was washed with water and dried it in sunlight for 1 h and then it was dried in shade. By the help of wood grinder the dried bark was powdered and was passed through the sieve No. 60 for powder analysis and coarse powder was used for phytochemical works.

Antiinflammatory activity: The extract was screened for antiinflammatory action by carrageenan induced rat paw edema method. Albino rats of either sex weighing 150-200 g were divided into five groups of six animals each. The first, second, third and fourth group serves as control, treated with aqueous extract (100 mg/kg), treated with aqueous extract (200 mg/kg) and treated with indomethacin (10 mg/kg), respectively. All drugs were administered orally. After 1 h of the administration of the drugs, dose 0.1 mL of 1 % w/v carrageenan solution in normal saline was infected into the subplantar tissue of the left hind paw of the rat and right kind hind paw serves as the control. The volume of the mercury displaced in the plethysmograph as measured at the end of 0, 1, 2 and 4 h, The % increase in paw edema of the treated group was compared with that of the control and the inhibitory effect of the drugs as studied. The relative potency of the drugs under investigations as calculated based upon the percentage inhibition of the inflammation.

Statistical analysis: The experimental results were expressed as the mean \pm standard error of mean (SEM) and the statistical significance was evaluated by using students't' test. The p-values of less than 0.001 imply significance.

TABLE-1
ANTIINFLAMMATORY ACTIVITY OF AQUEOUS BARK EXTRACT OF *Butea monosperma* (Lam.) Taub.
ON CARRAGEENAN INDUCED HIND PAW EDEMA IN RATS

Treatments (dose)	% Increase in paw volume (Mean \pm SEM)					% Inhibition in paw volume
	Post result time of assay (h)					
	0	1	2	3	4	
Control (0.5 mL/kg)	37.81 \pm 1.53	68.42 \pm 3.24	95.73 \pm 7.35	107.95 \pm 8.09	110.16 \pm 9.45	0
Ethanol extract (100 mg/kg)	36.88 \pm 1.52	53.51 \pm 4.96	66.64 \pm 5.79	68.93* \pm 6.52	64.83* \pm 6.92	36.14
Ethanol extract (200 mg/kg)	35.73 \pm 3.21	50.7 \pm 4.32	73.14 \pm 5.89	64.25* \pm 5.69	61.92* \pm 5.01	40.48
Indomethacin (10 mg/kg)	26.7 \pm 0.93	35.79 \pm 1.63	39.2 \pm 2.25	54.3* \pm 4.21	57.32* \pm 4.02	48.52

*p < 0.001 vs. control by students 't' test, n = 6.

Table-1 clearly indicates that the aqueous extract of *Butea monosperma* bark showed antiinflammatory effect in the carrageenan induced rat paw edema. It was found that the aqueous bark extract (200 mg/kg) showed significant activity ($p < 0.001$) at 2nd and 3rd h when compared to standard but it has been found that the dose of 200 mg/kg aqueous bark extract showed good activity as compared to dose of 100 mg/kg aqueous bark extract. Carrageenan induced paw edema was taken as a prototype of exudative phase of inflammation. The development of edema has been described as biphasic^{11,12}. The initial phase is attributed to the release of histamine, serotonin and kinin in the first hour. The edema maintained between the first and the second phase is due to kinin like substances. The second phase is said to be promoted by prostaglandin like substances. It has been reported that second phase edema is sensitive to the drug like hydrocortisone, phenylbutazone and indomethacin.

REFERENCES

- Anonymous, Wealth of India, Raw Material, CSIR, New Delhi, Vol. N-1, pp. 342-346 (2002).
- Kirtikar and Basu, Indian Medicinal Plant I, edn. 2, 3rd Reprint, xviii (2003).
- A. Maaz, A.S.A. Bhatti, S. Maryam, S. Afzal, M. Ahmad and A.N. Gilani, *Annals*, **16**, 73 (2010).
- Z. Iqbal, M. Lateef, A. Jabbar, M.N. Ghayur and A.H. Gilani, *Fitoterapia*, **77**, 137 (2006).
- K.G. Shah, A.J. Bakxi, V.J. Sukla, K.K. Dave, S. De and B. Ravishankar, *Indian J. Pharm. Sci.*, **52**, 272 (1990).
- V.S. Kasture, C.T. Chopde and V.K. Deshmukh, *J. Ethnopharmacol.*, **71**, 65 (2001).
- A. Gunakkunru, K. Padmanaban, P. Thirumal, J. Pritila, G. Parimala, N. Vengatesan, N. Gnanasekar, J.B. Perianayagam, S.K. Sharma and K.K. Pillai, *J. Ethnopharmacol.*, **98**, 241 (2005).
- M. Verma, Y.N. Shukla, S.P. Jain and S. Kumar, *J. Med. Arom. Plant Sci.*, **20**, 85 (1998).
- C.A. Winter, G.A. Risley and G.W. Nuss, *Proc. Soc. Exp. Bio. Med.*, **111**, 544 (1962).
- R. Vinegar, W. Schreiber and R. Hugo, *J. Pharm. Pharmacol.*, **166**, 95 (1969).
- R.H. Ebert, in eds.: B.W. Zwerttack, L. Grant and R.T. Mechskey, *The Inflammatory Process*, Academic Press, New York, edn. 12, p. 5 (1965).
- R.F. Woodson, *Statistical Method for Analysis of Biomedical Data*, Probability and Mathematical Statistics, Wiley, Chichester, p. 315 (1987).