



RESEARCH ARTICLE

ANTI-INFLAMMATORY ACTIVITY OF SOME MEDICINAL PLANTS

*Madhukar. B. Patil

Department of Botany for UG, PG and Research, J. E. S's, arts Science and Commerce College,
Nandurbar-425412

ARTICLE INFO

Article History:

Received 11th December, 2015
Received in revised form
24th January, 2016
Accepted 28th February, 2016
Published online 16th March, 2016

Key words:

Anti-inflammatory Activity,
Folk Medicine,
Solvent System and Ethnomedicinal.

ABSTRACT

Folk literature in field of Plants medicine is still barrel field of scientific investigations and finding. The current work based on such ethnomedicinal plant like *Butea monosperma* (Lam.) Taub., *Cleome viscosa* L., *Moringa oleifera* L. and *Sesbania grandiflora* (L.) Poir for its anti-inflammatory activity in different solvent system. It was found out that all four plants showing positive results were slight fluctuations according to solvent system used for plant extract. All results are recorded after 0.5, 1.0, 2.0 and 5.0 hrs. of treatment. Anti-inflammatory study from plant folk literature is still needs to be analyzed which will be more beneficial for humankind.

Copyright © 2016 Madhukar. B. Patil. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Madhukar. B. Patil, 2016. "Anti-inflammatory activity of some medicinal plants", *International Journal of Current Research*, 8, (03), 27141-27143.

INTRODUCTION

Plants are the always great source of food as well as medicine to human kind. Medicinal plants is a wide source for different variety of biologically active compounds (Madhukar B. Patil 2016). Diversed group of plant is used extensively as crude material or as pure compounds for treating various disease conditions (Durmowicz *et al.*, 1999) not only for mankind but also to various domestic animals. World Health Organization listed 21 000 plant species possessing medicinal properties in the world. About 2 500 plant species are used for medicinal purposes by traditional healers in India (Chandel *et al.*, 1996). The uses of different parts of plants by the local people of the plains or hilly areas in different aspects have been studied by several workers with regards to various therapeutical activity of plant (Jain SK 1991). Inflammatory process is a sequence of events that occurs in response to noxious stimuli, infection or trauma (Calixto *et al.*, 2004) in animals. The classic signs of inflammation are local redness, swelling, pain, heat and loss of function. The events of inflammation that Underline these manifestations are induced and regulated by a large number of chemical mediators, including kinins, eicosanoids, complement proteins, histamine and monokines (Percival, 2004).

Wide ranges of phytoconstituents were responsible for anti-inflammatory activity includes alkaloids, glycosides, tannins, phenolics, anthocyanins, sterols, triterpenoids *etc.* These phytoconstituents present in bark exerted a desired pharmacological effect on body and thus act as natural anti-inflammatory agent (Khare, 2007 and Madhukar B. Patil 2016). India is known for its nature wealth and inventions in the field of medicine, especially 'Aayurveda', which is the identity of India in the world. As well as traditional and folklore medicine system from generation to generation is rich in domestic recipes and communal practice (Patil *et al.*, 2015). Were many species of the plant bears very important active components and needs to elaborate farther in scientific manner from various folk literature. The Current study based towards the finding of anti-inflammatory activity of some folk medicinal plant with respect to scientific methodology for four plant including *Butea monosperma* (Lam.) Taub (Leaves), *Cleome viscosa* L. (Whole plant), *Moringa oleifera* L. (Flowers) and *Sesbania grandiflora* (L.) Poir (flowers) has been selected as per the folk literature.

***Butea monosperma* (Lam.) Taub. - (Fabaceae); Palas**

Plant is also known as flame of the forest. Various plant parts of this plant is used in traditional system of medicine to treat human ailments such as anorexia, burning urine, constipation, elephantiasis, gonorrhoea, night blindness, etc.

*Corresponding author: Madhukar. B. Patil,
Department of Botany for UG, PG and Research, J. E. S's, arts
Science and Commerce College, Nandurbar-425412.

***Cleome viscosa* L. (Capparidaceae); Piwali-Tilwan**

Plant widely distributed sticky herb with yellow flowers and slender pods. The juice of the plant is given orally in small quantity in fever. The plant is reported for its anthelmintic, rubifacient and vesicant properties. Various parts of this plant are used in traditional system of medicine to treat human ailments such as inflammation, scabies, and rheumatism and externally for wound. The poultice of seeds has been reported to be efficacious in chronic painful joints.

***Moringa oleifera* L. (Moringaceae); Shevaga, Shegu**

The fruits commonly known as drumsticks. It's reported in traditional system of medicine to treat human diseases of liver, paralysis spleen and tetanus. The available reports have demonstrated that the fruits are rich in minerals and mucilage, a pharmaceutical adjuvant, in addition to ascorbic acid oxidase. They are also used in the treatment of ascites and rheumatism.

Leaves of *Butea monosperma* (Lam.) Taub (Fabaceae), whole plant body of *Cleome viscosa* L. (Asteraceae), Flowers of *Moringa oleifera* L. (Moringaceae) and *Sesbania grandiflora* (L.) Poir (Fabaceae) are scientifically identified and material are air dried under the shade for 15 days. The complete shed dry material are grinded in powder for farther extraction procedure in solvent extraction. The powder was then percolated in 80% cold ethanol. Percolation was repeated for 3 to 4 times. The combined extract was evaporated on water bath at 50 ° C. Concentrated extract was then dried in vacuum desiccators. Adult albino rats of either sex weighing between 125-150 gm animals were housed in groups of six each. They were fasted 18 hours but during the experiment were allowed to have free to access to water.

Test for anti-inflammatory property

Petroleum ether, ethanol and aqueous extracts were tested for anti-inflammatory property on formalin-induced hind paw edema in rats.

Table 1. Anti-inflammatory activity of Four Plants in different solvent extracts

S. No.	Extract	Mean Difference in Paw Volume (ml) ± SEM (% Reduction)				
		Initial	0.5 Hour	1 Hour	2 Hours	5 Hours
Plant 1		<i>Butea monosperma</i> (Leaves)				
i	Control	0.19 ± 0.01	0.30 ± 0.04	0.33 ± 0.014	0.49 ± 0.03	0.53 ± 0.02
ii	Ibuprofen	0.30 ± 0.18	26.60 ± 0.22	24.30 ± 0.25	40.90 ± 0.29	43.40 ± 0.30
iii	Aqueous	0.60 ± 0.17	26.60 ± 0.22	24.30 ± 0.25	42.90 ± 0.28	43.40 ± 0.30
iv	Ethanol	0.30 ± 0.19	26.60 ± 0.22	27.30 ± 0.24	47.00 ± 0.26	47.20 ± 0.28
v	Petroleum ether	0.19 ± 0.01	23.40 ± 0.23	27.30 ± 0.24	44.90 ± 0.27	49.10 ± 0.27
Plant 2		<i>Cleome viscosa</i> (Whole plant)				
i	Control	0.18 ± 0.02	0.23 ± 0.01	0.35 ± 0.02	0.42 ± 0.02	0.55 ± 0.02
ii	Ibuprofen	0.20 ± 0.01	4.40 ± 0.22	40.00 ± 0.21	38.10 ± 0.26	52.80 ± 0.26
iii	Aqueous	0.19 ± 0.01	10.30 ± 0.23	31.30 ± 0.24	38.10 ± 0.26	51.0 ± 0.27
iv	Ethanol	0.16 ± 0.02	11.30 ± 0.20	40.0 ± 0.21	45.30 ± 0.23	54.60 ± 0.25
v	Petroleum ether	0.17 ± 0.01	08.70 ± 0.21	28.60 ± 0.25	31.00 ± 0.29	45.50 ± 0.30
Plant 3		<i>Moringa oleifera</i> (Flower)				
i	Control	0.17 ± 0.02	0.21 ± 0.01	0.39 ± 0.03	0.43 ± 0.02	0.57 ± 0.03
ii	Ibuprofen	0.16 ± 0.02	08.20 ± 0.21	41.10 ± 0.23	37.30 ± 0.27	47.40 ± 0.30
iii	Aqueous	0.21 ± 0.01	00.31 ± 0.27	0.5 ± 0.01	2.4 ± 0.42	14.10 ± 0.49
iv	Ethanol	0.17 ± 0.01	10.30 ± 0.22	33.40 ± 0.26	32.60 ± 0.29	47.90 ± 0.30
v	Petroleum ether	0.19 ± 0.01	0.21 ± 0.02	31.10 ± 0.23	41.90 ± 0.25	52.70 ± 0.27
Plant 4		<i>Sesbania grandiflora</i> (Flower)				
i	Control	0.19 ± 0.03	0.22 ± 0.02	0.35 ± 0.02	0.48 ± 0.02	0.57 ± 0.02
ii	Ibuprofen	0.18 ± 0.02	09.90 ± 0.20	28.60 ± 0.25	45.80 ± 0.26	52.70 ± 0.27
iii	Aqueous	0.19 ± 0.01	0.25 ± 0.03	17.20 ± 0.29	14.60 ± 0.41	18.20 ± 0.56
iv	Ethanol	0.17 ± 0.01	0.22 ± 0.02	31.50 ± 0.24	45.80 ± 0.26	47.40 ± 0.30
v	Petroleum ether	0.16 ± 0.01	0.27 ± 0.01	02.90 ± 0.34	10.20 ± 0.43	11.90 ± 0.59

***Sesbania grandiflora* (L.) Poir (Fabaceae); Hadga**

The flower is glabrous plant grown in many parts of India. Various plant parts of this plant is used in traditional system of medicine, to treat human ailments. The juice of flower is used as popular remedy for nasal-catarh and headache, also used in painful swelling (Madhukar B. Patil 2015).

MATERIALS AND METHODS

The parts of four plant species have been used in the experiment for the clinical scrutiny of anti-inflammatory potential with pharmacological methods (Harborne, 1998 and Kokate, 1994). The plant materials used for clinical scrutiny of anti-inflammatory potential are collected from the field, which are ethnobotanically used in Nandurbar district of Maharashtra.

Albino rats of either sex were selected, weighed and divided into five groups. All these animals were fasted for 18 hours before the beginning of the experiment and water was given ad libitum. The extracts were administered orally, in dose of 30 mg and 60 mg/kg. One hour before Carrageenan (1%w/v) injection was given at the sub planter region of the animals.

Paw volumes were measured plethysmometrically at 0.5, 1, 2, and 5 hour's interval after the administration of Carrageenan and compared with the Ibuprofen (30mg/kg) treated group. The percentage reduction in the edema volume was calculated and compiled in tables 6-10. The anti-inflammatory activity was expressed as: % of Inhibition of edema = 100 [1-(Vt / Vc)] Where Vt and Vc are volume of Carrageenan injected paws of drug treated group and control group respectively.

RESULTS AND DISCUSSION

Petroleum ether extract of *Butea monosperma* are showing maximum activity after five hours of treatment, which is followed by ethanolic extracts anti inflammation activity. Were aqueous solvent are showing similar activity as of ibuprofen in each interval of time as in Plant 1 of Table. In the case of Plant 2. *Cleome viscosa*, maximum activity is reported in ethanolic extract followed by aqueous solvent after five hours of treatment. Among all three solvent lest activity were recorded in petroleum ether but all over plant extract showing significant positive results as reported by earlier other in literature. Petroleum ether extract of *Moringa oleifera* shows best maximum activity among all other solvent for same plant after treatment of 5 hours. Same result are not true for the case *Moringa oleifera* aqueous extract and showing negative result as mention in table. Only ethanolic extract of *Sesbania grandiflora* is showing significant results among other solvents in plant 4 cases. Anti-inflammatory activity in all four plant were recorded in different solvent. It is noticeable that solvent system effects on the plant medicinal property and activity and hence all four tested plant shows different results in different solvent system.

Many phytoconstituents present in plants are responsible for anti-inflammatory activity includes alkaloids, glycosides, tannins, phenolics, anthocyanins, sterols, triterpenoids *etc.* Treatment plants may contents on of the above chemicals which are responsible for anti-inflammatory activity (Okoli et al., 2003, Khare CP 2007 and Okoli et al., 2005).

Conclusion

From the current experiment of anti-inflammatory activity of medicinal plants shows that methanolic and petroleum solvents are best as compared to other for particular test. All four plants are significantly shows anti-inflammatory activity and it can be reflect to scientific validation of folk literature. Farther experiment should be elaborate for scientific identifications and validations of other aspects of ethnomedicinal literature.

Acknowledgement

I thankful to the U.G.C., New Delhi for financial supports rendered to them separately in the form of Major Research Projects.

Author also thankful to the authorities Jijamata Education Societies, Arts Science and Commerce College, Nandurbar for supporting and providing infrastructure and facility for work.

REFERENCES

- Calixto, J.B., Campos, M.M., Otuki, M.F. and Santos, A.R.S. 2004. Anti-inflammatory compounds from plant origin. Part II. *Planta Medica*, 70:93-103.
- Chandel, K.P.S., Shukla, G. and Sharma, N. 1996. Biodiversity in medicinal and aromatic plants in India. Conservation and utilization. New Delhi: Indian Council of Agricultural Research, *National Bureau of Plant Genetic Resources, Pusa Campus*; p. 21- 24.
- Durmowicz, A.G. and Stenmark, K.R. 1999. Mechanisms of Structural Remodeling in Chronic Pulmonary Hypertension. *Pediatr. Rev.* 20: 91-101.
- Harborne, J. B. 1998. Phytochemical Methods. *Chapman and Hall*, London.
- Jain, S.K. 1991. Dictionary of Indian folk medicines and ethnobotany. New Delhi: Deep Publications.
- Khare, C.P. 2007. Indian Medicinal Plants 1st Edition.
- Kokate, C. K. 1994. Practical Pharmacognosy (3rd Edn.), Vallabh Prakashan, New Delhi.
- Madhukar, B. Patil. 2015. Ethnomedicines of Nandurbar District Maharashtra. Laxmi Book Publication.
- Madhukar, B. Patil. 2016. Anti-Diabetic Activity of Some Medicinal Plants. *Indian Journal Of Applied Research*, 6:1241-242.
- Okoli, C.D., Akah, B.A. and Nwafoli, S.W. 2003. Anti-inflammatory activity of plants. *Journal of Natural Remedies*.3: 1-30.
- Okoli, C.O., Akah, P.A. and Ezugworie, U. 2005. Antiinflammatory activity of extracts of root bark of *Securidaca longipedunculata* Fres (Polygalaceae)'. *Afr. J. Trad. 2*:354 – 63.
- Patil. M. B., Shaikh M. S. and Khan P. A. 2015. Conservational Studies On *Chlorophytum Borivilianum* (Safed Musli) In Nandurbar District, Maharashtra. *American Research Thoughts*, 1:6 1624-1630
- Percival, M. 1999. Understanding the Natural Management of Pain and Inflammation. *Clinical Nutrition Insights*, 4:1-5.
