

ANTI-ARTHRITIC ACTIVITY OF BARK EXTRACTS OF *ALANGIUM SALVIIFOLIUM WANG*

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ABSTRACT

The anti-arthritis activity of stem barks of Alangium salviifolium wang belonging to family Alangiaceae was studied in rats. The barks of Alangium salviifolium wang were collected and dried in shade and subjected for successive extraction with petroleum ether, Ethyl acetate, chloroform, methanol using soxhlet apparatus and distilled water by maceration. Each extracts were then subjected for preliminary phytochemical studies and pharmacological investigation. The acute toxicity studies were carried out according to the up and down method of CPCSEA guidelines No. 425 and anti-arthritis activity by Freund's adjuvant arthritis model. All the extracts have exhibited significant anti-arthritis activity. The present study reveals that the various extracts of Alangium salviifolium wang can be used as anti-arthritis drug.

Key words: *Alangium salviifolium wang, arthritis, adjuvant, indomethacin.*

INTRODUCTION

Alangium salviifolium wang is a deciduous, rambling shrub or a tree belonging to the family Alangiaceae. This family consist one genus with twenty two species, out of which *Alangium salviifolium wang* is the only species used medicinally in India, China and Phillipines¹. The different parts of this plant are used for a wide range of diseases. Root bark is an antidote for several poisons. Fruits are sweet, used to treat burning sensation, constipation and haemorrhage². The leaves are used as poultice in rheumatism³, stem barks exerts a biphasic action on the blood pressure in cats at lower doses and marked hypotension in higher doses⁴. The plant has been reported for its anti-tubercular, anti-spasmodic and anti-cholinesterase activity.

This plant has been used externally for rheumatism by the local people of Tirupattur and Vellore districts in Tamilnadu. However the plant is not scientifically explored for its anti-arthritis activity. Hence an effort has been made here to screen the plant for its anti-arthritis activity.

EXPERIMENTAL

Drugs and Chemicals: Analytical grade petroleum ether, ethyl acetate, chloroform, methanol, tween 80 (S.D. Fine chemicals, Mumbai), glass distilled water and Indomethacin (Micro Labs., Hosur) were used for the study.

Collection of the plant material: The stem barks of *Alangium salviifolium wang* was collected in the month of April-June from Tirupattur and Vellore districts in Tamilnadu. The fresh plant was identified and authenticated by comparing the voucher specimen at botanical survey of India, Coimbatore, Tamilnadu.

Extraction: The stem bark of *Alangium salviifolium wang* was cut into small pieces, dried and pulverized to coarse powder. The resultant was then subjected for successive extraction with petroleum ether (PeAS), ethyl acetate (EAAS), chloroform (ChAS) and methanol (MeAS) with soxhlet apparatus and distilled water (AqAS) with maceration. The extracts were then

concentrated in vacuum under reduced pressure using rotary flash evaporator and dried in desiccators.

Preliminary Phytochemical investigation: The extracts were subjected for preliminary qualitative chemical analysis by the standard procedures for identification of various phytoconstituents.

PHARMACOLOGICAL SCREENING

Experimental animals: Swiss albino mice (18-22 g) and Wistar albino rats (150-200 g) of either sex were acclimatized for 7 days under standard husbandry conditions, i.e. room temperature $26\pm 2^\circ\text{C}$, relative humidity 45-55% and light: dark cycle 12:12 h. The experimental protocols were approved by the Institutional Animal Ethical Committee (IAEC) of JSS College of Pharmacy, Ooty and Committee for the Purpose of Control and Prevention of Experiments on Animals (CPCSEA).

Acute toxicity studies: All the extracts were subjected for acute toxicity studies by following the OECD guidelines No. 425 of CPCSEA and $1/10^{\text{th}}$ of the LD_{50} dose was selected for the pharmacological activity.

Anti-arthritic activity: The method, by Freund's adjuvant arthritis model, was followed. The albino rats of either sex were selected and divided into seven groups, each comprising of six animals. Group I, served as control received vehicle 2ml/kg (0.3% carboxy methyl cellulose in distilled water), Group II, served as standard received indomethacin (100 mg/kg), Groups III, IV, V, VI, and VII served as tests received PeAS, EAAS, ChAS, MeAS and AqAS respectively. The experimental protocol was for 21 days and on the day one, Freund's adjuvant 0.1ml (1ml contains 1mg mycobacterium Tuberculosis (H37Ra, ATCC25177) heat killed and dried, 0.25 ml mineral oil and 0.15ml mannide mono oleate was administered into the sub plantar region of right hind paw. The individual extracts were administered to respective groups at a dose of 100mg/kg for 21 days. The paw volume and paw thickness was measured at day 4, day 8, day 14 and day 21.

Percentage inhibition of paw volume was calculated by the formula,

$$i = (1 - \Delta V_{\text{Treated}} / \Delta V_{\text{Control}}) * 100$$

Where, ΔV represents the mean change in paw volume

Statistical analysis: The mean paw volume was expressed in terms of mean \pm SEM and evaluated for statistical significance by ANOVA followed by Dunnett t test, $p < 0.05$ was considered as statistically significant.

RESULTS AND DISCUSSION

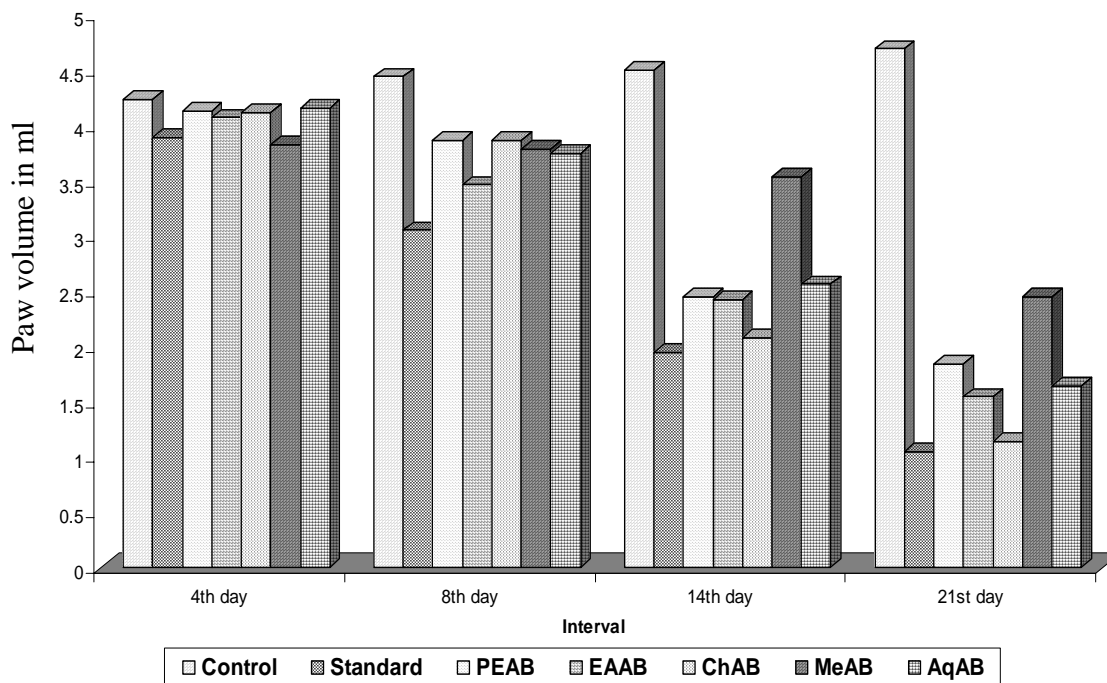
Preliminary phytochemical investigation revealed that pet. ether extract contains steroids, saponins and flavonoids, ethyl acetate extracts contains alkaloids, steroids, and flavonoids, chloroform extract contains alkaloids, steroids, and saponins, methanol extract contains alkaloids, steroids, tannins and saponins and aqueous extract contains alkaloids, steroids and saponins.

1. The LD_{50} values of all the extracts were found to be 1000mg/kg and hence $1/10^{\text{th}}$ of the LD_{50} was used for pharmacological studies. All the extracts of *Alangium salviifolium* wang showed potent anti-arthritic activity and the potency of the activity follows the order standard > chloroform > ethyl acetate > aqueous > pet. ether > methanol. Flavonoids, saponins, and

Table-1:Effect of various extracts of *Alangium salvifolium* (linn f.) wang in Adjuant induced arthritis model

Group	Mean changes in paw oedema \pm SEM				% inhibition of paw swelling on 21 st day
	Day 4	Day 8	Day 14	Day 21	
Control	4.23 \pm 0.06	4.44 \pm 0.15	4.50 \pm 0.09	4.69 \pm 0.11	0
Standard	3.89 \pm 0.05**	3.05 \pm 0.09**	1.94 \pm 0.18**	1.04 \pm 0.14**	77.82
PeAB	4.13 \pm 0.02**	3.86 \pm 0.12**	2.45 \pm 0.16**	1.84 \pm 0.05**	60.76
EAAB	4.07 \pm 0.08**	3.46 \pm 0.04**	2.42 \pm 0.12**	1.54 \pm 0.05**	67.16
ChAB	4.12 \pm 0.02**	3.86 \pm 0.02**	2.08 \pm 0.06**	1.14 \pm 0.12**	75.69
MeAB	3.82 \pm 0.03**	3.78 \pm 0.05**	3.53 \pm 0.16**	2.45 \pm 0.06**	47.76
AqAB	4.16 \pm 0.02**	3.74 \pm 0.15**	2.56 \pm 0.05**	1.64 \pm 0.12**	65.03

n=6, p<0.01**

Figure-1: Histogram showing effect of various extracts of *Alangium salvifolium* (linn f.) wang in Adjuant induced arthritis model

- steroids are reported to possess anti-inflammatory property; since these phytoconstituents are found in our extracts may have contributed for exhibited anti-arthritis activity by inhibiting the inflammation due to the Freund's adjuvant (inflammogen).

ACKNOWLEDGEMENT

The authors are thankful to Prof. (Dr.) B. Suresh, Principal, JSS College of Pharmacy, Ooty, Tamilnadu for providing the necessary facilities to our study.

REFERENCES

3. J.F. Dastur, Medicinal plants of India and Pakistan, (D.B. Taraporevala sons and Co, Mumbai, 12 (1977)
4. P.K. Warriar, Nambair, Ramakutty, Indian Medicinal Plants, a compendium of 500 species, Orient Longman Ltd, Chennai,77(2005)
5. The Wealth of India, CSIR, New Delhi, 121 (1985)
6. S.C. Prakash, B.Achari, *Experiential*, **33**, 934 (1970).
7. S.P Ambasta, The useful plants of India, CSIR, New Delhi, 25(1986)
8. C.K. Kokate, Practical Pharmacognosy, Orient Publishers, New Delhi 19-24(1989)
9. C.M. Pearson and E.D. Wood, *Arthr. Rheum*, **2**, 440 (1959).
10. Guidance document on acute oral toxicity testing. Series on testing and assessment NO.24, Organization for economic co-operation and development, OECD Environment, health and safety publications, Paris 2001.
11. M.N. Ghosh, Fundamentals of Experimental Pharmacology, Scientific Book agency, Calcutta, 156 (1984).

(Received: 21 May 2008

Accepted: 2 June 2008

RJC-192)

The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom.
-Isaac Asimov