

Alangium salvifolium (Linn. F) Wang: A Phytopharmacological Review

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ABSTRACT

Alangium salvifolium (Linn. F) Wang. is a small deciduous tree or shrub, which grow in the wild throughout the hotter parts of the India. It belongs to the family *Alangiaceae*. It is used as laxative, astringent, pungent, anthelmintic, purgative, emetic, anti protozoal, hypoglycemic activity, anti diabetic and for anti ulcer activity. The plant was also reported as antifungal activity, anti diabetic activity, antioxidant, antimicrobial activity, cardiac activity and anti fertility activity. This activity of the plant possess due to the important phytochemical constituents like flavonoids, saponins, glycosides, alkaloids and steroids etc.

Keywords: *Alangium salvifolium* (Linn. F) Wang, *Alangiaceae*, phytochemical constituents.

INTRODUCTION

The genus *Alangium* consists of 22 species that are growing in the wild throughout the hotter parts of the India¹. *Alangium* comes from the Tamil name *Alangi*². One of species named as *Alangium salvifolium* (Linn. F) Wang is more popular than its other species. *Alangium salvifolium* (Linn. F) Wang a small deciduous tree or shrub belongs to the family *Alangiaceae*³. It is native Western Africa, Madagascar, Southern and Eastern Asia, China, Malaysia, Indonesia, India, and Philippines, tropical Australia, the western Pacific Ocean islands and New Caledonia. In India, it is throughout the Hyderabad forests and Sitamata wildlife sanctuary, Rajasthan⁴.

*Ayurvedic Description*⁶

Sanskrit:- Ankola, Ankota, Nikochaka, Deerghakeela

Kannada :- Ankolimara, Ansaroli, Ankol

Malayalam:- Ankolam, Velittanti

Tamil :- Alangi, Ankolum

Telgu:- Ankolamu, Udagu

Bengali:- Akarkanta, Onkla

Marathi:- Ankola

Hindi:- Angol, Ankora, Dhera

English:- Sage leaved *Alangium*, Baghankura

Gujrati:- Ankol

Botanic Description

It is deciduous shrub or a tree, up to 10m in height with a maximum girth of 1.2m with rough light brown bark. Branch lets grey or purple-brown, often with strong spines up to 1.2 cm. long, pubescent or glabrous. Leaves alternate up to 15cm x 5cm simple, oblong lanceolate, repandly entire⁷. The flowers are White or cream, fragrant, 1.2-3.0cm long, axillary fascicles from the axils of fallen leaves⁸. seeds are Stamens 10-32, 5-14 mm long; ovary inferior, 1-2-celled, style 8.5-27.5 mm long, glabrous,

stigma conical or head-shaped, slightly lobed. The fruits are ellipsoidal when young and become purplish red globular when ripen⁹.

*Taxonomy of Alangium Plant*⁵

Kingdom:- Plantae

Class:- Dicotyledons

Order:-Cornales

Family:- Cornaceae (*Alangiaceae*)

Genus:-*Alangium*

Species:- *Salvifolium*

Benefits of Plant

The wood is valued for musical instruments and furniture in India. It is also used in building as beams, for flooring, furniture, cabinet work, inlaying, carving, bobbins, spindles, shuttles, rice pestles, tool handles, walking sticks, gunstocks and handicraft articles in Asia. The twigs are used for brushing the teeth in India. The stems are used for spears in Kenya¹⁰. The different parts of this plant are also used for wide range of diseases. The root is used for diarrhoea, paralysis, piles, vomiting and is useful for external application in acute case of rheumatism, leprosy and inflammation¹¹. Seeds are used in hemorrhages, leprosy, skin disease and arthritic. Leaves are used in diabetes¹². The bark shows antitubercular activity¹³. Root bark used as antidote for several poisons. Fruits are sweet, cooling and purgative and used as a poultice for treating burning sensation and haemorrhage¹⁴.

Chemical Constituents

The seeds were reported to contain several alkaloids *Alangimarine*, *Alamanine*, *Alangimaridine*, *Emetine*, *cephaeline*, *isocephaeline*, *Psychotrine*, *protoberberine* alkaloid. They also contain *betulinic acid*, *betulin*, *lupeol*, *alangol*, *beta-sitosterol*, and *tannins*¹⁵. The stem bark



Figure 1: Whole Plant



Figure 2: Spine of Stem



Figure 3: Fruit



Figure 4: Floral Bud Leaves

revealed the presence of benzoquinolizidine alkaloid, alancine and isoalamarine. The total non alkaloid extract of the stem bark contained beta-sitosterol, stigmasterol and viscous oil. The leaves were reported to contain several alkaloids, sterols and terpenoids. These were identified as ankorine, choline chloride, alangimarckine, deoxytubulosine, alangiside, stigmasterol, and beta-sitosterol¹⁶. The fruits contained methylisoalangsides, isoalangsides, demethylneoalangsides, 3-o-demethyl-2-o-methylisoalangsides; glucopyranoside is also reported from the plant. Root contained cephaeline, tubulosine, isotubulosine, psychotrine, and alangsine and Root bark contained Alangicine, d-methylpsychotrine, marckine, marckidine, lamarckinine¹⁷.

Pharmacological Activity

Antimicrobial Activity

The ethanolic leaves extract of *Alangium salviifolium* Wangerin showed a broad spectrum of antimicrobial activity against pathogenic strains of *Escherichia coli*, *Proteus vulgaris*, *Bacillus subtilis*, *Enterobacter faecalis*, *Serratia marcescens* and *Klebsiella pneumoniae*¹⁸.

Wound Healing Activity

The ethanol extract of *Alangium salviifolium* possesses a definite prohealing action. This is demonstrated by a significant increase in the rate of wound contraction and by enhanced epithelization¹⁹.

Anticonvulsant Activity (Maximal electroshock (MES) induced seizures)

Alangium salviifolium ethanolic extract at a dosage of 250 and 500 mg/kg showed 67.77% and 80.70% inhibition of convulsions produced by MES. The ethanolic extract at the

dose of 500 mg/kg showed activity comparable to that of standard drug diazepam (83.01% inhibition)¹⁹.

Larvicidal Activity

Alangium salviifolium tested for its larvicidal activity against *Artemia salina*. Chloroform and Methanol extract showed 100 % mortality at the lowest level of concentration, i.e., 0.25ml/10ml v/v. Hexane extract has showed 100 % larvicidal potency at the concentration of 0.5ml/10ml volume. However, very poor activity was recorded for aqueous extract of the leaves of *Alangium salviifolium*²¹.

Antidiabetic Activity

Alangium salviifolium bark possesses potential antidiabetic activity. The ethanol and aqueous extracts of *Alangium salviifolium* bark lowered the blood glucose levels in oral glucose tolerance test as well as in alloxan induced diabetic rats²².

Antioxidant Activity

Antioxidant and anti microbial activities of the alcoholic and aqueous extracts from the root of *Alangium salviifolium* wang were reported due to presence of phenolic compounds and flavanoids in alcoholic and aqueous extracts²³.

Antifungal Activity

Antifungal activity investigated against dermatomycotic organisms and its toxicity of *Alangium salviifolium*. The lyophilized powder extract (4.59%) of pulverized wood was tested for its inhibitory effect by agar disc diffusion test. Using Buehler's method. The results demonstrated the inhibitory effect of *Alangium salviifolium* subsp hexapetalum against fungi without any local toxicity²⁴.

Antidiuretic Activity

Antidiuretic activity of Benzene and ethyl acetate extracts of *Alangium salvifolium* were reported. The study involved determination of total urine volume and Na⁺, K⁺ and Cl⁻ concentration in urine. Frusemide was included as standard. Both the extracts exhibited significant diuretic activity. Ethyl acetate extract was found to be more active than benzene extracts²⁵.

Antiulcer Activity

Antiulcer effect of ethanolic extract of leaves of *Alangium salvifolium* on gastric lesion induced by ethanol in rats. From findings, it concluded that the ethanolic extract of *Alangium salvifolium* has a significant anti ulcer activity at 400mg/kg and 800mg/kg dose. The results were comparable with that of standard and control groups²⁶.

Antianxiety and CNS Depressant Activity

Alangium salvifolium flower methanol extract and chloroform fraction induced antianxiety and depression using EPM and open field test and hole cross test at dose 50 and 100 mg/kg²⁷.

CONCLUSION

Medicinal plants form a large group of economically important plants that provide the basic raw materials for indigenous pharmaceuticals. Medicinal plants have a vital role to preserve the human healthy life. Numerous traditionally used plants exhibit pharmacological properties. *Alangium salvifolium*(Linn. F) Wang is an ayurvedic medicinal plant used for the various diseases like diarrhoea, paralysis, piles, rheumatism, leprosy and inflammation, hemorrhages, leprosy, skin disease and arthritic. Pharmacological *Alangium salvifolium* used as Antimicrobial Activity, Antidiabetic Activity, Antioxidant Activity, Antiepileptic activity, Analgesic and Anti-Inflammatory Activities, Antianxiety activity. *Alangium salvifolium* flower as an antianxiety activity. No report is available on the anxiolytic activity of *Alangium salvifolium* on seeds of plant.

REFERENCES

1. Rajkumar S, Kumar NS. Isolation Chemical Characterization and Hypoglycemic Activity of *Alangium salifolium* Wang Bark in Alloxan Induced Hyperglycemic Rats. IJPSR, 2011; 2(6): 1518-1524.
2. Venkateshwarlu R, Butchi A, Gopal, V, Yerragunta. Phytochemistry and pharmacology of *Alangium salvifolium*: A Review. Journal of Pharmacy Research, 2011; 4(5):1423-1425.
3. Jubie S, Jawahar N, Ruby Koshy, Gowramma B, Murugan V, Suresh B. Anti-Arthritic Activity of Bark Extracts of *Alangium salifolium* Wang. Rasayan J. Chem, 2008; 3(1):433-436.
4. Anurag M, Prasad GG. Antidiabetic Activity of *Alangium salvifolium* in Alloxan Induced Diabetic Rats. IRJP2, 2011; 6: 101-105.
5. Meenakshi R, Rajesh G. Comprehensive Review on Pharmacological Profile of *Alangium salvifolium*: A Mesdicinal Plant. UK Journal of Pharmaceutical and Biosciences, 2015; 3(3): 22-28.
6. Gupta AK, Neeraj T. Review on Indian Medicinal plants. Indian Council of Medical Research, New Delhi, 2004; 1.
7. Panda P. Formulation and Evaluation of Topical Dosage form of *Alangium salvifolium* Linn. and their Wound Healing Activity. AJPSR, 2011; 6(1):10-22.
8. Parida NK, Debata PC, Panda PK. Neuropharmacological Screening of *Alangium salvifolium* (Linn.f.) Stem Bark Extract in Rats. Asian Journal of Chemistry, 2010; 22(10): 7507-7512.
9. Kritikar KR, Basu BD. Indian medicinal plants. International Book Distributer, 1991; 3rd Ed.
10. Tanwer BS, Vijayvergia R. Biological Evaluation of *Alangium salvifolium* (L.F.) Wangerin. J. Chem. Pharm. Res, 2014;6(12): 611-618.
11. Nahar L, Zahan R, Mosaddik A, Islam S, Haque, A, Frazil A, Jesmin M. Antioxidant and Antitumor Activity of Chloroform Extract of *Alangium salvifolium* Flowers. Phytopharmacology, 2012; 2(1):123-134.
12. Hepcy KD, Dinakar A, Senthil KN. Antidiabetic, Analgesic and Anti-Inflammatory activity of Aqueous extracts of Stem and Leaves of *Alangium salvifolium* and *Pavonia zeylanica*. Int J Drug Dev & Res, 2012; 4(4): 298-306.
13. Saravanan D, Padmavathy J, Parimala MJ, Lakshmi IA, Praveen. Pharmacognostic Evaluation of Leaves of *Alangium salvifolium* Linn. IJRAP, 2011; 2:216-220.
14. Ahad HA, Padmaja BS, Yesupadam P, Guruprakash P, Sravanthi M, Ramyasree P. Phytochemical and Hypoglycemic Evaluation of *Alangium salvifolium* Root Extract. Journal of Scientific Research, 2011; 3(2):1649-53.
15. Bhargava PN, Dutt S. Chemical Examination of the Seeds of *Alangium lamarckii* Thw. Isolation of Alangol. Proc Indian Acad Sci 16A, 328-331.
16. Gupta AK, Neeraj T. Review on Indian Medicinal plants. Indian Council of Medical Research, New Delhi, 2004; 1.
17. Yoganarasimhan SN. Medicinal Plant of India, Karnataka. Interline Publishing Pvt. Ltd Bangalore, 1994; 1: 21-22.
18. Singh DSR, Singh SP, Vidyasagar GM. Antimicrobial Activity of Ethanolic Leaves Extract of *Alangium salvifolium* (L.f.) Wangerin. International Journal of Research in Plant Science, 2014;4(4): 77-80.
19. Inayathulla, Karigar AA, Shariff WR, Sikarwar MS. Wound Healing Property of Alcoholic Extract of Leaves of *Alangium salvifolium*. Journal of Pharmacy Research, 2010; 3(2):267-269.
20. Sharma AK, Agarwali V, Kumar R, Balasubramaniam A, Mishra A, Gupta R, Pharmacological Studies on Seeds of *Alangium salvifolium* Linn. Drug Research, 2011; 68(6):897-904.
21. Prakash NKU, Bhuvanewar S, Preethy S, Rajalakshmi N, Saranya M, Anto JR, Arokiyaraj S. Studies on Antimicrobial, Antioxidant, Larvicidal, Pesticidal Activity and Phytochemistry of Leaves of *Alangium salvifolium* Linn Wang. Int. J. Pharm. Sci, 2013; 5(2): 86-89.

22. Sharma AK, Agarwal V, Sharma S, Chauhan B, Sharma AD, Punia R. Antidiabetic Effect of Bark of *Alangium salvifolium* in Alloxan-Induced Diabetic Rats. *Journal of Global Pharma. Technology*, 2011; 3(4):26-32.
23. Jain VC, Patel NM, Shah DP, Patel PK, Joshi BH. Antioxidant and Antimicrobial Activities of *Alangium salvifolium* (L.F) Wang Root. *Global Journal of Pharmacology*, 2010; 4 (1): 13-18.
24. Wuthi-udomlert M, Sompop prathanturarug, Yuvadee wongkrajang. Antifungal Activity and Local Toxicity Study of *Alangium salvifolium* sub sp Hexapetalum. *South East Asian J Trop Med Pub Health*, 2002; 33(3): 152-154.
25. Rajamanickam V, Rajasekaran A, Quine S, Jesupillai M, Sabitha R. Diuretic activity of *Alangium salvifolium* sub. sp. Hexapetalum. *The Internet Journal of Alternative Medicine*, 2008; 8(1).
26. Sreekanth P, Sudhakara K, Gouse basha G, Murali K, Sanjeeva Kumar A. Anti ulcer Effect of *Alangium salvifolium* Ethanolic Leaf Extract on Gastric Lesion Induced by Ethanol in Rats. *Asian J Pharm Clin Res*, 2011; 4(2): 112-114.
27. Zahan R, Haque MD.E, Nahar L, Mosaddik MD.A, Haque MD.E. Evaluation of Anxiolytic and CNS Depressant activity of *Alangium salvifolium* Wang flower. *IRJP*, 2012;3(4):144-147.