

**A REVIEW ON PHYTOCHEMICAL AND PHARMACOLOGICAL POTENTIAL OF
FICUS RACEMOSA LINN**

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ABSTRACT

Ficus racemosa Linn. is an important medicinal plant, found in Asia. It is popularly known as 'Umbar.' Traditionally it uses for treatment of various ailments. It shows presence of primary and secondary metabolites which play significant role in prevention of various disorders. Many active constituents that have been isolated from various parts of this plant possess useful pharmacological activities. The literature survey proposed that it has multiple actions that include antidiabetic, antioxidant, antidiarrhoeal, anti-inflammatory, antipyretic, antifungal, antibacterial, hypolipidemic, antifilarial, and hepatoprotection. This review article elaborately describes the phytochemistry, pharmacology and traditional applications of this plant. In future this review would assist researchers to gather scientific information.

KEYWORD: *Ficus racemosa*, metabolites, phytochemistry.

INTRODUCTION



Figure: *Ficus racemosa* Plant with Leaves and Fruits.

In India traditional systems of medicines like Ayurveda existence for around 3000 years. The medicinal plants are rich in secondary metabolites (which are potential sources of drugs) and essential oils of therapeutic importance. The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability.^[1-2]

Ayurvedic formulations have been successfully evaluated and used for the treatment of various ailments

from treating snake bites, to wound healing, with skin ointments protecting from infections, controlling anxiety, increasing memory and sharpening the overall beauty of a person. But, the wide spread acceptance and growth of second degree system of medicine, has been under few setbacks, of which are, lack of proper guidelines, regarding growing, preserving, storing, managing, and isolating the vital components to be incorporated into dosage forms for their prospective use. Some limitations on traditional system of medicines for evidence-based studies like efficacy and safety. Among the hundreds of prominent medicinal plants of value, the plant *Ficus racemosa* Linn. holds traditional significance in vedic texts i.e. 'Atharva veda'. In Sanskrit it's known as 'udumbara tree'.^[3]

PHYTOCHEMICAL REVIEW

The following phytochemicals were identified from various parts of *Ficus racemosa*.

Table: Phytochemical Review.

Parts	Phytoconstituents
Leaves	Bergapten, bergaptol, lanosterol, β -Sitosterol, Stigmasterol, lupen-3-one, β -sitosterol-d-glucoside (phytosterolin), vitamin k, campesterol, stigmasterol, isofucosterol, α myrin, lupeol, tannic acid, arginine, serine, aspartic acid, glycine, threonine, alanine, proline, tryptophan, tyrosine, methionine, valine, isoleucine, leucine, n-nonacosane, nhentricontanen, hexa-cosanol, and n-octacosan. ^[4]
Stem:	Campesterol, hentriacontane, hentriacontanol, kaempferol, stigmasterol, methyl ellagic acid.
Fruit	Glauanol, hentriacontane, β sitosterol, glauanolacetate, glucose, tiglic acid, esters of taraxasterol, lupeolacetate, friedelin, higher hydrocarbons and other phytosterol. ^[5]
Stem Bark	Leucyanidin-3-O- β - glucopyranosides, leucoperalagonidin 3-O- α -L-rhamnopyranoside, β -sitosterol, unidentified long chain ketone, lupeol, its acetate, α - amyryl acetate. A new tetracyclic triterpene, glauanol acetate which is characterized as 13 α , 14 β , 17 β H, 20- α H-lanosta-8, 22-diene 3- β -acetate and racemosic acid were isolated from leaves. ^[6-8]

PHARMACOLOGICAL REVIEW

Antibacterial Activity

He studied the antibacterial potency of petroleum ether extract of *Ficus racemosa* Linn. leaves against bacterias *E.coli* ATCC 10536, *Bacillus pumilis* ATCC 14884, *Bacillus subtilis* ATCC 6633, *Pseudomonas aeruginosa* ATCC 25619, and *Staphylococcus aureus* ATCC 29737. The results were significant comparable to standard Chloramphenicol. The antibacterial activities are attributes of terpenoids, alkaloids thus the *Ficus racemosa* has confirmed antibacterial activity in all sorts of conditions and can be actively incorporated into ointments for infectious conditions.^[9]

Anti-inflammatory Activity

He carried out bio-assay of the ethanol fraction of the plant, and found out racemosic acid as potent inhibitor of COX-1 and 5-LOX in vitro with IC₅₀ values of 90 and 18 μ M. They also carried out a comparative in-vitro study on 33 ethanol extracts from *Ficus racemosa*, *Clematis pickeringii* stem, *Acacia adsurgens* leaves, *Tinospora smilacina* stem and *Morinda citrifolia* found the plants effective with Ficus showing inhibitory effect on COX-1 with the IC₅₀ values of 100.^[10] (11 Mandal et al., 2000) investigated anti-inflammatory activity in *Ficus racemosa* on carrageenan, serotonin, histamine, and dextran-induced rat hind paw edema models. The extract showed anti-inflammatory activity at doses of 200 and 400 mg/kg and found the results to be significant comparable to phenylbutazone.^[11]

Antioxidant Activity

He reported antioxidant potential in the racemosic acid by scavenging ABTS free radical cations with an IC₅₀ values of 19 μ M.^[10]

Angiotensin Converting Enzyme Inhibitor Activity

He studied Angiotensin converting enzyme inhibitory activity of cold and aqueous extract of *Ficus racemosa* (Moraceae) bark stem. The effect was studied using rabbit lung, and partially purified kidney ACE. The results were found to be effective. The application can be used to produce cardio protective herbal tonics.^[12]

Cardioprotective Activity

He investigated the cardio protective potential of standardized extract of *Ficus racemosa* stem bark against doxorubicin induced toxicity. The extract significantly decreased the (TBARS) i.e. thiobarbituric acid reactive substances & increased glutathione levels in serum and cardiac tissue.^[13]

Diabetic Activity

He studied protective effects of tannins from *Ficus racemosa* on the lipid profile and antioxidant parameters in high fat meal and streptozotocin induced hypercholesteremia associated diabetes model in rats. The administration of tannin fraction from *Ficus racemosa* significantly reversed the increased blood glucose, total cholesterol, triglycerides, low density lipoprotein and also significantly restored the insulin and high density lipoprotein in the serum. In addition, tannins significantly restored the activity of antioxidant enzymes such as superoxide dismutase, catalase, and decreased the, glutathione peroxidase, and glutathione, thereby restoring the antioxidant status of the organs to normal levels.^[14]

Antidiuretic Activity

The bark decoction of *Ficus racemosa* at a differential dose like of 250, 500 or 1000 mg/kg shows antidiuretic, had a rapid onset (within 1 hr.), peaked at 3 h and lasted throughout the study period (5 hr.). However, antidiuretic potential of decoction was about 50% lower than that of ADH. The decoction was well tolerated even with subchronic administration. The decoction caused a reduction in urinary Na⁺ level and Na⁺/K⁺ ratio, and an increase in urinary osmolarity indicating multiple mechanisms of action. This proves its efficacy as antidiuretic agent.^[15]

Antialgesic Activity

The ethanol extract of bark and leaves evaluated for analgesic activity by analgesimeter at 100, 300 and 500mg/kg was found to possess dose dependent analgesic activity.^[16]

Hepatoprotective Activity

He reported hepatoprotective effects of petroleum ether and methanol extract of *Ficus racemosa* Linn. (Moraceae) stem bark. CC14 administration induced a significant decrease in serum total protein, albumin, urea and significantly increase in total bilirubin associated with a marked elevation in the activities of aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP). Pretreatment with *Ficus racemosa* petroleum ether extract and *Ficus racemosa* methanolic extract showed significant restoration of total protein and albumin to near normal rats.^[17]

Memory Enhancing Activity

It found out that *F. racemosa* had a potential in management of Alzheimer disease. Protective Renal Oxidative Injury.^[18] He studied the potent beneficial effects of the plant *Ficus racemosa* extract. Treatment of rats with *Ficus racemosa* extract (200 mg/kg body weight and 400 mg/kg body weight) resulted in significant decrease in xanthine oxidase, lipid peroxidation, gamma glutamyl transpeptidase activity. Overall, thus *Ficus racemosa* extract is a potent chemopreventive agent and suppresses potassium bromated mediated nephrotoxicity in rats.^[19]

Wound Healing Activity

He reported the wound healing potential *Ficus racemose*.^[20]

Anthelmintic Activity

The bark extract were evaluated for anthelmintic activity using adult earthworms, which exhibited a spontaneous motility (paralysis) With 50 mg/mL of aqueous extract the effects were compared with 3% piperazine citrate. There was no final recovery in the case of worms treated with aqueous extract in contrast to piperazine citrate, the worms recovered completely within 5 h. This result shows the anthelmintic nature of the extract.^[21]

TRADITIONAL APPLICATIONS

In Ayurveda the plant parts such as roots are used for hydrophobia; bark for acrid, cooling, galactogogue; considered excellent for gynecological disorders. Fruits are astringent to bowels, styptic, tonic and useful in the treatment of leucorrhoea, blood disorders, burning sensation, fatigue, urinary discharges, leprosy, menorrhagia, epistaxis, and intestinal worms. While in urinary system of medicines, leaves are used as astringent, in bronchitis; fruits are useful in treatment of dry cough, loss of voice, diseases of kidney and spleen. Bark is useful in Asthma and piles. Latex is applied externally on chronic infected wounds to alleviate edema, pain and to promote the healing. The leaf buds have been in application to skin, to improve complexion.^[22-27]

CONCLUSION

The present review study shows the phytochemicals present in different parts of *Ficus racemosa* plant and

their pharmacological properties. It contains various primary as well as secondary metabolites like phenolics, flavonoids, steroidal, tannins, amino acids, sugar derivatives etc. They showed their potentials and proven pharmacological properties as discussed in present paper. However, more Clinical and Pathological studies should be conducted to investigate the active potentials of bioactive compounds present in this plant.

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