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Review Article

THE PHYTOCONSTITUENTS AND PHARMACOLOGICAL ACTIONS OF FICUS RACEMOSA - AN UPDATED REVIEW

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Abstract:

Ficus racemosa known as the cluster fig tree, Indian fig tree or goolar. This is native to Australia Malaysia, Indo-China, and the Indian subcontinent. It is unusual in that its figs grow on or close to the tree trunk, termed cauliflory. In India, the tree and its fruit are called gular in the north and atti in the south. The fruits are a favorite staple of the common Indian macaque. It serves as a food plant for the caterpillars of the two-brand crow butterfly of northern Australia. The tree is harvested from the wild for local use as a food and medicine. It is often cultivated, both for its fruit and also as a shade tree in plantations and an ornamental tree in parks, large gardens. They are used in various preserves and side-dishes. Unripe fruits are pickled and used in soups. The fruit can be dried and ground into flour then eaten with sugar and milk. The leaves are used in the treatment of diarrhoea. The bark is astringent. It is used in the treatment of haematuria, menorrhagia, and haemoptysis. The fruit is astringent. The fruit, when filled with sugar, is considered to be very cooling. The root is chewed as a treatment for tonsillitis. This herb is mentioned in all ancient scriptures of Ayurveda, Siddha, Unani and Homeopathy. It is a good remedy for excessive appetite. The extract of fruit is used in diabetes, leucoderma, refrigerant, antiasthmatic, hepatoprotective, antioxidant, antiulcer and menorrhagia. It is used locally to relieve inflammation of skin wounds, lymphadenitis, in sprains and fibrositis. The present review is therefore, an effort to give a detailed study in Pharmacognostical, phytochemicals & Pharmacological properties.

KEYWORDS: *Ficus racemosa*, hypoglycemic activity, antifertility activity, Memory enhancing activity

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INTRODUCTION:

Ficus racemosa it belongs to family Moraceae syn. *Ficus glomerata* Roxb. Is the major group of angiosperm (flowering plant). They are widely distributed throughout Asia, Africa, America, Australia, Himalayan ranges, Punjab, Khasia Mountain, Bihar, Orissa, Rajasthan, Deccan, China, Indonesia and Malaysia. Udumbar is used from ancient time for treating the many diseases. This tree is used traditionally for public health. It is also called yajnodumbara and grows all over the India at different areas. The common name is

‘Audumbar’ and ‘Umbar’ and used in Unani, Ayurveda and Homeopathy. In review macroscopically studies, microscopically studies and chemical constituents are studied on different parts of the plant. Traditional uses and pharmacological uses are described, the extraction of leaves, fruit, stem, bark and latex are done due to this the important constituents are isolated in respective solvent like ethanol, methanol, acetone, petroleum ether, ethyl acetate and water. The more information is described below and the people are moving towards ayurvedic preparations.

VERNACULAR NAMES

LANGUAGE	NAMES
Sanskrit	Udumbara
Hindi	Goolar
Marathi	Umbar
Bengali	Jagnadumbar
Oriya	Dimris
Malayalam	Atti
Nepali	Gular, Dumri
Kannada	Rumadi
Tamil	Atti

TAXONOMICAL CLASSIFICATION

“The study of the identification, taxonomy and nomenclature of organisms, including the classification of living things with regard to their natural relationships and study of variation and the evolution of taxa”. Classification of *Ficus racemosa* is given below:

Kingdom:	Plantae
Sub-kingdom:	Tracheobionta
Clade:	Angiosperms
Clade:	Eudicots
Clade:	Rosids
Division:	Magnoliophyta
Superdivision:	Spermatophyta
Class:	Equisetopsida, Magnoliopsida
Subclass:	Hamamelididae
Order:	Rosales, Urticales
Family:	Moraceae
Genus:	<i>Ficus</i>
Species:	<i>Ficus racemosa</i> Linn.

HISTORY

It is a one of the herb mentioned in all ancient scriptures of Ayurveda. Udumbara is considered sacred to God Dattaguru, has various synonyms like yajnanga, yajniya, yajnyoga and yajnyasara suggesting

the use in ritual sacrifice. The ksiriviksa produced on cutting or plucking the leaf, latex oozes out. The plant is from a group, called pancavalkala. Maharishi Charaka has categorized Udumbara as anti-diuretic herb (mutrasangrahaniya). Susruta has described the properties of the plant, like astringent, promotes callus healing in fractures (bhagnasandhaniya) and useful in vaginal disorders.



MACROSCOPICAL STUDY

Size	10-16cm Long, 6-8cm Width
Shape	Alternate, Bilateral, Simple, Petiolated, Lanceolate To Ovate, Stipulated, Elliptical
Petiole	3-5cm Long, 1-4cm Diameter
Venation	Reticulate
Apex	Acute
Base	Symmetrical
Margin	Entire
Color	Dark Green
Surface	Smooth
Odour	Aromatic, Pleasant
Taste	Astringent

MICROSCOPICAL STUDY

• **Cork:** It contains polygonal or rectangular cells. The cork is made up of polygonal or rectangular cells. The phellogen contains 1-2 layers of thin walled cells.

• **Phelloderm:** It contains compact tissue of parenchymatous cells or small groups of sclereids and it is lignified with simple pits. Several parenchymatous cells which contains single prism of calcium oxalate brownish content. • **Cortex:** It contains numerous sclereids they are rectangular or isodiametric and pitted thick walled and cortical cell contains resinous mass. Prismatic crystals of calcium oxalate are present in cells. Phloem contains sieve tubes, companion cells, phloem parenchyma, sclereids, phloem fibers and medullary rays. Starch grains they are present in ovoid to spherical. Laticiferous vessels are brown.

CHEMICAL CONSTITUENTS

The racemosa Linn species contains primary and secondary metabolites like, carbohydrates, mucilage, alkaloids, flavonoids, steroids, tannins, terpenoids, phenolic substance, glycosides, saponins, coumarins, triterpenoids, α phenolics, bergapten, bergaptol, lanosterol, stigmaterol, lupen-3-one, β -sitosterol-d-glucoside and vitamin K₁, α hydroxyl ursolic acid, protocatechuic acid, oleanolic acid, rusolic acid, maslinic acid also used for treating many diseases. The non-enzymatic constituents like

phenolic components flavonoids, vitamin C and the enzymatic constituents like ascorbate oxidase, ascorbate peroxidase, catalase peroxidase. quercetin-3-glucoside, rutin and methyl esters of leucoanthocyanins are obtained from leaves.

Bark –Tannin, wax, saponin, β -sitosterol, steroids, alkaloids, gluanol acetate, leucopelargonidin-3-O- α -L-rhamnopyranoside, leucopelargonidin-3-O- β -D-glucopyranoside, leucocyanidin-3-O- β -D-glucopyranoside, lupeol, cerylbehenate, lupeol acetate, α -amyrin acetate, leucocyanidin and leucoanthocyanin, kaempferol, coumarin, ellagic acid, α -amyrin, stigmaterol, quercetin, bergenin and racemosic acid

Leaves -Campestrol, arabinose, bergapten, psoralenes, ficusin, stigmaterol, isofucosterol, α -amyrin, lupeol, tannic, arginine, serine, aspartic acid, glycine, threonine, alanine, proline, tryptophan, tyrosine, methionine, valine, isoleucine, leucine, n-nonacosane, n-hentricontanen, hexa-cosanol, n-octacosangluanol acetate, racemosic acid, quercetin-3-glucoside, rutin and methyl esters of leucoanthocyanins.

Fruits -The phenolic compounds like gallic acid and ellagic acid. Furanocoumarins like psoralen, bergapten, β -sitosterol tetracyclic triterpene, gluanol acetate, Glucanol, tiglic acid, taraxasterol, lupeol acetate, friedelin, hydrocarbons, sterols, glycosides, carbohydrates, hentriacontane and α -

amyrin. Latex -Euphol, isoeuphorbol, β -sitosterol, 4-deoxyphorbol, cycloartenol and cycloeuphordenol.

PHARMACOLOGICAL ACTION

Hypoglycemic activity:

Ficus racemosa shows hypoglycemic activity, to evaluate the study of hypoglycemia activity ethanol extract is used (250mg/kg/day, p.o.) Lowering of blood glucose level was determined in 2 weeks. Alloxan diabetic albino rats they conform hypoglycemic activity. Methanolic extract of stem bark also show glucose lowering activity at dose 200-400mg/kg, p.o. this test is done on normal and alloxan induced diabetic rats. Whereas, this activity was compared with standard antidiabetic agent glibenclamide at dose 10mg/kg it shows antidiabetic activity. β -sitosterol isolated from stem bark it is more potent when compared with other isolated compound. Methanol extract of fruit given in 1,2,3, and 4g/kg it lowers the blood glucose level in normal and alloxan induced diabetic rabbits. α -amyrin acetate is important constituent isolated from fruits and the dose is given at 100gm/kg which lowers the blood glucose level in 5 to 24hrs gives result at 18.4% and 17.0% in sucrose when compared with streptozotocin induced diabetic rat model.

Antioxidant activity:

The 1, 1-diphenyl-2-picrylhydrazyl radical (DPPH) used to evaluate antioxidant activity by free radical scavenging method. DPPH free radical reduced when hydrazine react with hydrogen donors, it forms stable DPPH molecules through donation of hydrogen. Due to this method it is easy to determine antiradical power of an antioxidant activity by decrease in absorbance of DPPH at 519nm. Color change from purple to yellow, there is discolorations of DPPH when absorbance of methanolic extract of stem and leaves was measured at 517nm. The extract of stem and leaves was compared with standard butylated hydroxytoluene (BHT) by free radical scavenging method the extract show antioxidant activity.

Hepatoprotective activity:

The leaves extract and stem bark extract shows hepatoprotective activity in rats by inducing chronic liver damage by subcutaneous injection of 50% v/v carbon tetrachloride in liquid paraffin at dose of 3ml/kg, it is given in alternate days for 4 weeks. Stem bark extract dose given in 250 and 500mg/kg, all biochemical parameters like SGOT, SGPT, serum bilirubin and alkaline phosphate was evaluated and it is compared with standard silymarin.

Antitussive activity:

Methanol extract (200mg/kg) was compared with standard codeine phosphate (10mg) that is evaluated in sulfur dioxide gas-induced cough in mice. Maximum activity was seen at 90 min after administration of the bark extract, maximum inhibition is 56.9%.

Antilulcer activity:

50% of ethanol extract of fruit used as antiulcer and reduce oxidative damage at mucosal lining of stomach. The studies are done on animal models of rats at dose 50, 100 and 200mg/kg, twice a day for 5 days. For evaluating the antiulcer activity the models are used like ethanol, pylorus ligation and cold strain-induced ulcer.

Wound healing activity:

Ointment was prepared by using powder of *F. racemosa* with petroleum jelly 15%w/w. The study was done on Charles Foster strain rats by using 8mm of full-thickness punch wound model. It heals highly significant generation of tissue DNA, RNA and total protein was observed by using ointment.

Anthelmintic activity:

Earthworms lost their activity when it comes in contact with ethanol bark extract at 5, 10, and 50 mg/ml given dose-dependently. There is loss of mortality and cause death. The higher concentration of bark extract shows paralytic effect and death time is shorter and it is compared with standard piperazine citrate 3% within 90 min.

Antidiuretic activity: Decoction of *Ficus racemosa* bark given at dose at 250, 500 or 1000 mg/kg body weight it is given for 5 hrs at 1 hr of interval. It shows reduction in Na^+ level and Na^+/K^+ ratio and increase urinary osmolarity.

Antidiarrheal activity: Ethanol extract of stem bark was studied on different experimental models of diarrhea in rats. The inhibitory activity was observed against castor oil induced diarrhea, PGE₂ induced enter pooling and charcoal meal tests this was done in rats. By using this extract on rats it shows antidiarrheal activity.

Memory enhancing activity:

It shows activity on Alzheimer disease which is caused by decrease in acetylcholine level and it is an extrapyramidal disease.

Antifertility activity:

The extract shows anti fertility about 70% reduction in sperm count, motility, viability & abnormal morphology was determined reduction in weight of reproductive organ and

the level of sialic acid in epididymis and fructosein seminal vesicle the bark extract shows 80% of vaginal contraception.

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CONCLUSION:

Umbur is use for public health because the studies proved the umbur can be used in day to day life. The medicinal plants are widely used by medicinal practitioner for the treatment of the diseases. The extract of different part of plant like leaves, latex, fruits & bark shows pharmacological action. The important constituents are isolated from plant and it is responsible for curing the diseases like anti-diabetic, anti-diarrheal, anti-bacterial, anti-fungal, anti-ulcer, anti-wormicidal, anti-hypoglycemic, hypolipidemic, anti-diuretic and anti-inflammatory. It is popular indigenous system of medicines like Ayurveda, Siddha, Unani and Homeopathy. It takes vital place in traditional system. The study explores the potential of plant and signifies its importance in the pharmaceutical industries. The plant is widely available all over the India. It has antibiotic and antibacterial properties due to this the formulation can be prepared like lotion and cream and has antioxidant property due to this it is helpful in chemoprotection and radioprotection. It is used in food preparation but the safety must be taken while giving in pregnancy

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