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Original Article

A Review on Ficus racemosa Linn: Medicinal Herb

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ABSTRACT

F*rom ancient time, Herbal medicines are used in all over India. Ficus racemosa L. is widely used plant which belongs to family Moraceae. This is popular in all over India and these are especially popular in indigenous system of medicines. the F.racemosa L. widely distributed in Asia, Africa, America. The various parts of plant are used such as leaves, bark, seed, root, stems and fruits. The plant consist of different chemical constituent such flavanoid glycoside, alkaloids, phenolic acids , steroids , saponins , coumarins , tannins , triterpenoids , flavonoids, vitamin C. The chemical constituent presents in plants are responsible for pharmacological activity. The various parts of plant shows different pharmacological activity such as ,anticancer, anthelmintic antibacterial, antipyretic, wound healing anticarcinogenic ,antidiuretic, antitussive, anti-inflammatory, antidiarrheal, antifilarial, hepatoprotective ,antiulcer, antiasthmatic activity.*

Keywords : *Ficus racemosa L., Chemical constituent ,Pharmacological activity*

1. Introduction

From ancient times, Herbal medicines were used in India. World Health Organization has estimated that 80% of population of india use the herbal medicines.1, 2 Many plant species have been identified to shows potent pharmacological activity against disease.

The Ficus racemosa L. plant is widely used plant belonging to family Moraceae. These plant commonly known as Cluster fig., gular fig,. also known as Umber. These are popular in indigenous system of medicine like Ayurveda, Siddha, Unani and Homoeopathy. This plant consist of various chemical constituent such as alkaloids, flavanoid glycoside, phenolic acids, saponin, coumarines, tannins, vitamin C triterpenoids, the stem bark contains tannin, wax, and steroid such as β-sitosterol, lupeol, ceryl behenate, lupeol acetate. the unripe fruits are used as a source of dietary fiber, The different parts of plants are responsible for different pharmacological activity such as hypolipidemic, hypoglycemic, antidiuretic, antitussive, anti-inflammatory, antiulcer, antifungal ,antidiarrhoel, Hepatoprotective and radioprotective. the bark of plant material is shows anti-inflammatory activity and anticancer activity, used in treatment of swelling of gums, swelling of neck, gonorrhea.

The Comprehensive account of morphology, geographical region and microscopical characters, and macroscopical characters, determination of impurity in different parts of plant, chemical constituents, uses, Pharmacological action are included in view of finding importance of plant.

Synonym: Ficus glomerata Roxb.
Kingdom : Plantae
Division: Magnoliophyta
Class: Magnolipsida
Order: Urticales
Family: Moraceae
Genus: Ficus
Species: racemosa

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Ayurvedic Properties of F. racemosa L.[7]
Rasa : Guru
Virya : Sheet
Vipak : Katu
Doshaghnata : Kapha, Pitta

Fig no.1 Images of fruits of Ficus Racemosa Linn.

Geographical Source:
This plant of Ficus racemosa L.is cultivated in Australia, Malaysia, South East Asia, Pakistan, Shrilanka and different regions of India.

Macroscopical Character:
The leaves are dark green, ovate and elliptic in shape, the fruits are found in large bunches, the fruits are green in colour which turn to orange, which gives reddish or dark crimson colour on ripening. the roots are longs and brown in colour. It have characteristic odour and slightly bitter in taste.

Microscopical Character:
The cork is made up of polygonal cells. The phellogen is made up of one to two layers of thin layers of cells. The phelloderm contains small groups of sclereids so This sclereids are lignified in nature with simple pits. the parenchymatous cells contains calcium oxalate crystal(prism) and brownish matter. The phloem rays may be uniseriate, multiseriate, homocellular or heterocellular. The Phloem fibres are non-lignified in nature. Starch grains are ovoid and spherical in nature[10].

Chemical constituent:

Leaf	Sterols, tannins and flavonoids, triterpenoids (Lanosterol) and alkaloids. A new tetracyclic triterpene glauanol acetate, racemosic acid were isolated from the leaves.
Stem-Bark	Tannin, wax, saponin gluanol acetate, β-sitosterol, lupeol, ceryl behenate, lupeol acetate, α-amyrin acetate, leucoanthocyanidin, and leucoanthocyanin from trunk bark, lauanol acetate, lupeol, β-sitosterol and stigmasterol were isolated from stem bark
Trunk-Bark	Upenol, β-sistosterol and stigmasterol.
Fruit	Glauanol, β sitosterol, glauanolacetate, glucose, tiglic acid, esters of taraxasterol, lupeolacetate, friedelin, higher hydrocarbons and other phytosterol
Root	Cycloartenol, euphorbol and its hexacosanoate, taraxerone, tinyatoxin; bark euphorbol and its hexacosanate, ingenol and its triacetate, taraxerone.
Latex	a-amyrin, β-sitosterol, cycloartenol, cycloeuphordenol, 4-deoxyphorbol and its esters, euphol, euphorbinol, isoeuphorbol, palmitic acid, taraxerol, tinyatoxin, tirucallol, trimethyl ellagic acid.

The concentration of minerals in Bark of F. racemosa Linn.:

The various minerals found in bark of F. racemosa Linn. It contains abundant concentration of potassium, calcium, and chloride of minerals. The bark acts as good source of metal element which includes zinc, copper, phosphorous, nickel, iron, magnesium.6

Preliminary Phytochemical Analysis of F. racemosa L. plant:

The different extract has been prepared by using various solvent system and such extract have been employed for phytochemical test in identification of chemical constituent.

Sr.No.	Chemical constituent	Chemical Test [17]
1.	Alkaloid	Mayer's test, Hager's test, Picric acid test
2.	Flavanoid	Shinoda test
3.	Triterpenoids	Libermann-Burchard Test
4	Glycosides	Saponin,
5	Tannin	Goldbeater skin test, Ferric chloride test

Uses:

Roots: Dysentery, pectorial complaints, hydrophobia, diabetes, treatment of mumps

Barks: Gynecological disorder, cooling, acrid, treatment of asthma, piles.

Fruits: Astringent, stomachic, treatment of Leucorrhoea, blood disorder, burning sensation, fatigue, urinary discharge, leprosy, menorrhagia, removing of intestinal worms, dry cough, loss of voice, kidney disease, spleen disease, miscarriage.

Latex: Healing of wounds, aphrodisiac, ant diabetic, antidiarrheal. Leaf buds: Improving of skin complexion.

Leaves: ulcer, wounds, glandular swelling, mouthwashes preparation, abscess[16-18]

Identity, Purity and Strength of Ficus racemosa Linn

The following parameters were measured to identify presence of foreign matters in F. racemosa Linn. The different extract of F. racemosa Linn. has been used for following test.6,15

Foreign matter	**Not more than 2%**
Total Ash	**Not more than 14%**
Acid insoluble ash	**Not more than 1%**
Alcohol soluble extractive	**Not more than 7%**
Water soluble extractive	**Not more than 9%**

Pharmacological activity:

Antidiuretic: The decoction of the bark of F. racemosa L. claimed for antidiuretic and the three doses was administered in rats.(250, 500, 1000mg/kg). It has rapid onset of action although, it has greater peak plasma concentration so it also reduces excretion of the urinary Na+ level.[11, 40]

Antitussive: The methanolic extract of stem bark was employed in antitussive activity against cough induced model so, sulphur dioxide gas usually used in mice. the maximum inhibition of 56.9% at dose of 200 mg/kg for 90 min after administration of drug.[24]

Anthelmintic: The crude extracts of bark were evaluated for anthelmintic activity so, in this case The bark were extracted with methanol and ethanol and water as s solvent. Aqueous extract of F.racemosa L. was evaluated by using adult earthworms such as Pheretima posthuma. therefore they exhibit a dose - dependent inhibition of spontaneous paralysis and these response was compared with 3% piperazine citrate. From the all the observation it was concluded that , The aq extract of drug was showed vermicidal activity.[11]

Antibacterial: The hydro alcoholic extract of leaves was found effective against Actinomyces vicosus. From the observation it was concluded that, the hydro alcoholic extract was showed significant antibacterial activity, the minimum inhibitory concentration was found to be 0.08mg/ml.

Antipyretic: Methanolic extract of stem bark was evaluated on normal body temperature and yeast - induced pyrexia in albino rats, at doses of 100, 200 and 300 mg/kg body wt. p.o. It was a showed significant dose - dependent reduction in normal body temperature and yeast - provoked elevated temperature which extended up to 5 h after drug administration. The anti - pyretic effect of methanolic extract was compared with standard drug paracetamol.

Wound healing:

Ethanol extract of stem bark showed wound healing in excised and incised wound model in rats.

Ant filarial: The alcoholic and aqueous extract of plant has been evaluated for antifilarial activity so, Alcoholic as well as aqueous extracts caused inhibition of spontaneous motility of whole worm and nerve muscle preparation of Setaria cervi characterized by increase in amplitude and tone of contractions. Both extracts caused death of microfilariae in vitro LC50 and LC90 were 21 and 35 ng/ml, respectively for alcoholic, which were 27 and 42 ng/ml for aqueous extracts.

Antidiarrheal: Ethanolic extract of stem bark was studied for anti - diarrhoeal activity against different experimental models of diarrhoea in rats. It showed significant inhibitory activity against castor oil induced diarrhoea and PGE2 induced enteropooling in rats. These extracts also showed a significant reduction in gastrointestinal motility in charcoal meal tests in rats. The results obtained established its efficacy as anti – diarrheal agent.

Antifungal: The F. racemosa L. was employed for antifungal activity. The methanolic extract of F.racemosa shows inhibitory activity against different fungi such as Trichophyton mentagrophytas, Trichophyton rubrum, and Candida albicum.[26, 41,42]

Larvicidal : The different solvent extract of bark and leaf were employed for larvicidal activity The extract were prepared by using different solvent such as methanol, pet ether, acetone, hexane. The larvicidal activity of methanolic, hexane, pet ether, acetone extract of bark and leaf were used for toxicity studies against Larvae of Culex quinquefasciatus. from all observation it was showed that, all the extract of plant showed significant larvicidal activity however, acetone extract of bark showed highest larvicidal activity. The potent chemical constituent was separated by fractionating the column, the gluanol acetate was tetra peptide terpene and it was a new mosquito repellent drug and it was also effective against A.aegypti.

Anti - inflammatory: The anti -inflammatory activity of F. racemosa L. leaf extract was studied on carrageenan, serotonin, histamine and dextran - induced rat hind paw edema models. The extract (400 mg/kg) exhibited maximum anti-inflammatory effect of 30.4, 32.2, 33.9 and 32.0% with carrageenan, serotonin, histamine, and dextran -induced rat paw oedema, respectively. In a chronic test, the extract (400 /kg) showed 41.5% reduction in granuloma weight,

The anti-inflammatory activity was compared with standard drug such as phenylbutazone. The ethanolic extract of leaves of F.racemosa L. showed significant inhibitory activity against COX-1 and LOX-2 with invitro IC50 values 90 and 18 micro meter.20

Antiulcer: The 50 % ethanol extract of fruits was studied in different gastric ulcer models, viz pylorus ligation, ethanol and cold restraint stress induced ulcers in rats at a dose of 50, 100 and 200 mg/kg body weight p.o. for 5 days twice daily. The extract showed dose dependent inhibition of ulcer index in all three models of ulcer.

Analgesic activity: The ethanol extract of bark and leaves was evaluated for analgesic activity by analgesiometer at 100, 300 and

500 mg/kg and was found to possess dose dependent analgesic activity.21

Hepatoprotective: An ethanolic extract of the leaves was evaluated for hepatoprotective activity in rats by inducing chronic liver damage by subcutaneous injection of 50% v/v carbon tetrachloride in liquid paraffin at a dose of 3 mL/kg on alternate days for a period of 4 weeks. The biochemical parameters SGOT, SGPT, serum and alkaline phosphates were estimated to assess the liver function In other study, the methanol extract of stem bark at the doses of 250 and 500 mg/kg was evaluated for its hepatoprotective activity in rats against carbon tetrachloride induced liver damage with silymarin as standard.[22]

Hypercholesteromic activity:

The isolation of alpha amyrin acetate was done from aerial roots of F. bengalensis and this isolated alpha amyrin was feed to mice for 10 consecutive days after 10 days the decreased in the triglyceride and cholesterol, and LDL by 21.5 % 24.1% 21.2%, increased HDL to TC by 21.0% and 59.1% respectively hence from all above observation it was concluded that the alpha amyrin acetate improve the plasma lipid profile and lowering of total plasma cholesterol.

Anticancer Activity: The methanolic extract of F. racemosa L. were used for anticancer activity when drug were administered by oral route of administration at dose of 200 to 300 mg /kg, it considerable decreases the xanthine oxidase synthesis and decrease in concentration of alpha glutaryl, lipid peroxidation, generation of hydrogen peroxide, DNA synthesis. The enhancement of renal glutathione so the F. racemosa was act as good chemo preventive agents, it was also analysed that this drug inhibit the KBr induced carcinomas**.**

Anti-asthmatic Activity: An ethanolic bark extract of F.racemosa L. were employed for Anti-asthmatic activity. This study were performed by using swiss albino mice, total 6 mice were used and divided into three groups. This activity studied by using two methods clonidine induced catalepsy in mice and Mast cell degranulation; hence finally it was observed that, An ethanolic extract of bark of F. racemosa showed significant anti-asthmatic activity.

Antioxidant: The petroleum ether, ethyl acetate, butanol, ethanolic extract of stem bark of Ficus racemosa Linn. Were subjected for antioxidant activity. This activity was investigated by using total phenolic content, Inhibitory effect on 1, 1 diphenyl 2 picrylhydrazyl radical assay. From the observation it was showed that, ethyl acetate, ethanolic stem bark extract of Ficus racemosa Linn. was showed significant antioxidant activity.

Antioxidant: The water and ethanolic extract were used for antibacterial activity by time resolved and steady state methods. The ethanolic extract of F. racemosa L. exhibited a dose dependent activity by steady state method. The free radical scavenging activity were done by measuring DPPH, hydroxyl radical scavenging activity and when standard drug compared with ethanolic extract of F.racemosa L.it showed significant lipid peroxidation activity.

Memory enhancing activity: The aqueous bark extract of Ficus racemosa Linn, used for investigation of memory enhancing activity. This activity improves the level of acetylcholine in brain however it was concluded that, it is used in Alzheimer disease.[39]

Conclusion

From ancient times, The study of herbal medicine is important. The herbal medicine has fewer side effects as compared to synthetic medicines. The Ficus racemosa Linn. is a herbal plant which is versatile in nature and has many medicinal properties and before some decades the many research has been done on different part of Ficus racemosa Linn. The purity of F.racemosa of plant material has been analyzed by using different parameter such as ash value, acid soluble extractive value, alkaline insoluble extractive value. The detail description of geographical and microscopical and macroscopical characteristics has been discussed. The different parts of F. racemosa L. plant have many pharmacological properties which is beneficial to human being. the leaves, fruits, stem, bark has different pharmacological activity such as anti-inflammatory, antiulcer, antidiabetic, antidiarrheal, ant filarial, anthelmintic, antibacterial, antitussive, hepatoprotective, analgesic, antidiuretic, anticancer, Anti-asthmatic activity.

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Conflict of Interest:

We declare that we have no conflict of interest.

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