

## PHARMACOLOGICAL ACTIVITY OF FICUS RACEMOSA A REVIEW

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### ABSTRACT

*Ficus racemosa* Linn. of family Moraceae is used in conventional system of medicine for the treatment of several diseases. It is one of the plants mentioned in all ancient scriptures of Ayurveda, Unani,

Siddha, and Homeopathy. Various plant parts such as bark, leaf, fruits, root and latex are used as astringent, vermifuge, carminative and anti-dysentery. It is an excellent remedy for excessive appetite. The extract of fruit is used in diabetes, menorrhagia and leucoderma. It is used topically to relieve inflammation of skin wounds, in sprains, fibrositis and lymphadenitis. It can also be used as an antihyperlipidemic agent and hypoglycemic agent. It can be used to treat carcinoma.

**KEYWORDS:** *Ficus racemosa* Linn., Moraceae, Cluster Fig, Goolar Fig, Traditional medicine, Phytoconstituents.

### INTRODUCTION

Medicinal plants are essential for pharmacological research and drug development, not only when plant constituents are used as therapeutic agents, but also as starting materials for the synthesis of drug or as models for pharmacologically active compounds. The genus *Ficus* includes some 750 species of woody plants occurring in most tropical and subtropical forests all over the world. The genus is remarkable for the large variation in the habits of its species. *Ficus racemosa* is used in conventional system of medicine for the treatment of several disorders. The Indian plant *Ficus racemosa* belongs to family Moraceae. The species is from India and occurs everywhere in India. It commonly occurs in foothills of Himalaya, Assam, Kerala, Tamil Nadu, Sikkim, Andhra Pradesh, Maharashtra. *Ficus* plants

have long been used as astringents, carminatives, vermonicides, stomachics, hypotensives, antiemetics and anti-dysentery drugs, sometimes as an anti-diabetic agent.

### ***FICUS RACEMOSA***

#### **Scientific Classification**

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Rosales

Family: Moraceae

Genus: Ficus

Species: *F. racemosa*

Synonyms: *Ficus glomerata* Roxb

Common names: Udumbara, Gular fig, Cluster fig, Country fig, Cluster Fig Tree, Goolar Fig.<sup>[1]</sup>

#### **ABOUT *FICUS RACEMOSA* PLANT**

The height of the plant is up to 18 meters; leaves are ovate, ovate-lanceolate, elliptic, sub-acute, entire and petiolate. Leaves shed in December and replenish in January and April. When the tree becomes bare in that short period, figs are pyriform, and fruits become red when ripe. This plant is seen dwelling in areas up to 1200 m altitude on hilltops. These plants require well-drained medium to heavy soils for its cultivation. Plant propagation is normally done by cuttings of stem and root suckers, seeds can also be used for propagation.<sup>[2]</sup> Pollination is done by very small wasps. It has evergreen leaves, if it is close to a water source.



Leaves of *Ficus racemosa*



Fruits of *Ficus racemosa*



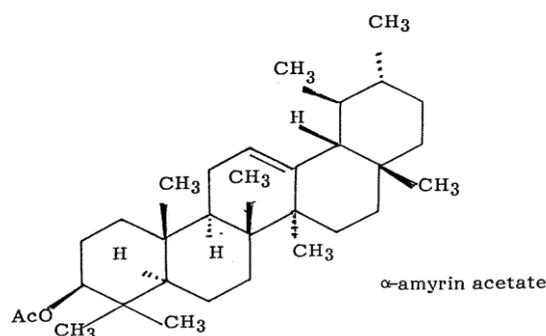
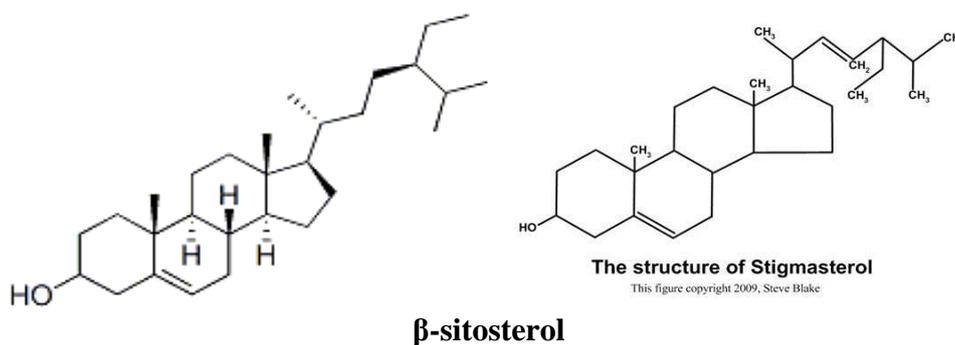
*Ficus racemosa*

## Microscopy

The cork is made up of rectangular or polygonal cells. The phellogen is made up of 1-2 layers of thin walled cells. Phelloderm is well marked close-packed tissue consisting mainly of parenchymatous cells with isolated or small groups of sclereids, especially in inner region. Sclereids are lignified with simple pits. Several parenchymatous cells contain single prismatic calcium oxalate crystal or some brownish content. The cortex is wide with numerous sclereids and some cortical cells contain resinous mass. Laticiferous vessels with a light brown granular material are present in the phloem region. Cambium is present in 2-3 layered of tangentially elongated thin walled cells.<sup>[1]</sup>

## Chemical Constituents

*Ficus racemosa* contains significant compounds like flavanoids, tannins, alkaloids, steroids and saponins.<sup>[9]</sup> Stem-bark has gluanol acetate,  $\beta$ -sitosterol, leucocyanidin-3-O- $\beta$ -D-glucopyranoside, leucopelargonidin-3-O- $\beta$ -D-glucopyranoside, leucopelargonidin -3-O- $\alpha$ -L-rhamnopyranoside, ceryl behenate, lupeol, lupeol acetate and  $\alpha$ -amyrin acetate. From trunk bark, lupenol, stigmasterol and  $\beta$ -sitosterol were isolated. Fruit contains gluanol acetate, glucose, tiglic acid, esters of taraxasterol, lupeol acetate, higher hydrocarbons (Hentriacontane), friedelin and other phytosterols. A new tetracyclic triterpene gluanol acetate which is characterized as  $13\alpha$ ,  $17\beta$ H,  $14\beta$ ,  $20\alpha$ H-lanosta-8, 22-diene-3 $\beta$ -acetate and racemosic acid were isolated from the leaves.'



## PHARMACOLOGICAL ACTIVITIES OF *FICUS RACEMOSA*

### **Antidiuretic**

The decoction of the bark of *F. racemosa* is used as an antidiuretic and its potential is evaluated in rats using 3 doses (250, 500 or 1000 mg/kg). It had a rapid onset (within 1 h), peaked at 3 h and lasted throughout the study period (five hrs). It also caused a reduction in urinary Na<sup>+</sup> level and Na<sup>+</sup>/K<sup>+</sup> ratio, and an increase in urinary osmolarity indicating multiple mechanisms of action<sup>[4][1]</sup>

### **Antifilarial**

Alcoholic and aqueous extracts of *Ficus racemosa* caused inhibition of spontaneous motility of whole worm and nerve muscle preparation of *Setaria cervi* specified by increase in amplitude and tone of contractions. Both extracts caused death of microfilariae in vitro. LC90 and LC50 were 21 and 35 ng/ml, respectively for alcoholic, which were 27 and 42 ng/ml for aqueous extract.<sup>[1]</sup>

### **Anti-inflammatory and Analgesic**

Methanol extract of *Ficus racemosa* is used during inflammatory condition of both acute (carrageenan induced hind paw edema and acetic acid generated vascular permeability) and subchronic (cotton pellet induced granuloma) prevented increase in malondialdehyde formation & myeloperoxidase activity in oedematous and granulomatous tissue. Further serum marker enzymes (AST, ALP and ALT) increased in inflammatory conditions were also inhibited with methanol extract treatment. Methanolic extract of *Ficus racemosa* also shows analgesic activity.<sup>[1]</sup>

### **Antidiarrhoeal**

Ethanol extract of stem bark of *Ficus racemosa* uses for antidiarrhoeal activity against different experimental models of diarrhoea in rats. experimental models such as *Ricinus communis* (Castor oil) induced diarrhoea. This extract also shows a significant reduction in GIT motility in charcoal meal tests in rats. The results obtained established its efficacy as anti-diarrhoeal agent.<sup>[4]</sup>

### **Antioxidant**

In general, ethanolic extract of *Ficus racemosa* shows considerable antioxidant activity in DPPH free radical scavenging activity and total antioxidant capacity when contrast to standard as ascorbic acid. In addition to the potential protective effects against diabetes and

cancers, antioxidant nutrients also appear to play a significant role in preventing heart diseases, cataracts, asthma, neurodegenerative diseases, premature aging, etc. Therefore, better understanding of the role of antioxidants in food has a direct impact on the prevention of the above diseases. These results clearly suggested that ethanolic extract of *Ficus racemosa* can be used in an antioxidant diet, after efficacy trials.<sup>[5]</sup>

### **Antibacterial**

Hydro-alcoholic extract of *Ficus racemosa* is used for antibacterial activity. The concentration of extract of leaves of *Ficus racemosa* 0.08 mg/ml, 0.09 mg/ml; 0.1 mg/ml shown the zone of inhibition. This concentration of extract shows better antibacterial activity.<sup>[6]</sup>

### **Antitussive**

The methanolic extract of stem bark of *Ficus racemosa* was tested for its antitussive potential against a cough. Antitussive activity is checked by using cough induced model by sulphur dioxide gas in mice. The extract exhibited maximum inhibition of 56.9% at a dose of 200 mg/kg (p.o.) 90 min after administration.<sup>[1]</sup>

### **Wound healing**

In the wound healing study the rate of wound contraction by excision wound model is studied. The ethanolic extract of *Ficus racemosa* showed marked decrease in wound area in comparison to control group when examined for wound healing activity by topical application in albino rat. The ethanolic extract of *Ficus racemosa* accelerates the wound healing process by reducing the surface area of the wound.<sup>[7]</sup>

### **Antiulcer**

The ethanolic extract of fruits of *Ficus racemosa* is studied in different gastric ulcer models such as pylorus ligation, C<sub>2</sub>H<sub>5</sub>OH and cold restraint stress induced ulcers in rats at a dose of 50, 100 and 200 mg/kg body weight p.o. for five days twice daily. The extract showed dose dependent inhibition of ulcer index in all three models of ulcer.<sup>[7]</sup>

### **Hepatoprotective**

An ethanolic extract of the leaves of *Ficus racemosa* is evaluated for hepatoprotective activity in rats by inducing chronic liver damage by SC injection of 50% v/v carbon tetrachloride in liquid paraffin at a dose of 3 mL/kg on alternate days for a period of four weeks. The

biochemical parameters SGOT, SGPT, serum bilirubin and alkaline phosphates were estimated to assess the liver function.<sup>[1]</sup>

### **Anthelmintic activity**

Methanolic extracts of *Ficus racemosa* were screened for their in vitro anthelmintic activity. Results revealed that *Ficus racemosa* is effective by 4 h post exposure, and was as good as *A. sativum* and *Z. officinale* by 6 h post exposure. It is concluded that all the studied plants had some Anthelmintic activity.

### **Antidiabetic**

The glucose-lowering efficacy of CH<sub>3</sub>OH extract of the stem bark of *Ficus racemosa* was evaluated both in normal and alloxan-induced hyperglycemic rats at the doses of 200 and 400 mg/kg. The activity was also comparable to that of the effect produced by Glibenclamide (10 mg/kg) as a standard anti-diabetic agent. Hypoglycemic studies on *F. racemosa* shows that the absorption of the drug gives a better hypoglycemic activity.<sup>[4]</sup>

### **Renal anticarcinogenic**

*F. racemosa* extract (200 mg/kg body weight & 400 mg/kg body weight) results in a significant decrease in xanthine oxidase, lipid peroxidation,  $\gamma$ glutamyl transpeptidase and hydrogen peroxide. There is significant recovery of renal glutathione content & antioxidant enzymes, decrease in the enhancement of renal ornithine decarboxylase activity, DNA synthesis, blood urea nitrogen and serum creatinine.<sup>[1]</sup>

### **CONCLUSION**

From these findings it is proved that the C<sub>2</sub>H<sub>5</sub>OH extract of *Ficus racemosa* showed a greater effect against microbes, worms and renal carcinoma in rat compared with the std drugs. Methanolic extract of *Ficus racemosa* shows good effect against antidiabetic, anti-inflammatory and antitussive, anthelmintic activity.

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