



PHARMACOGNOSTIC AND THERAPEUTIC ACCOUNT ON FICUS RACEMOSA LINN.

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ABSTRACT :-

Plant's different sections have beneficial pharmacological. **Ficus Racemosa** is a significant medicinal plant that grows in Southeast Asia, Australia, and India. It's commonly referred to as "**gular**." Its presence of **β -sitosterol** lowers the content of blood glucose. Several of the active ingredients that have been extracted from this species are used in African traditional medicine in the treatment of a wide variety of ailments and diseases such as convulsive disorder, wound healing, gonorrhoea, tuberculosis, diabetes, Diarrheal infections, dysentery, malaria and HIV. The aim of this study was to isolate the phytochemical constituents in the plant and test them for their antibacterial activity Materials. Numerous pharmacological activities, such as *antidiabetic, antioxidant, Anti diarrheal, anti-inflammatory, antipyretic, antifungal, antibacterial, hypolipidemic, anti-filarial, and hepatoprotective*, were suggested by the literature review. The phytochemistry, pharmacology, toxicity, and traditional uses of this plant are all covered in detail in this review article. We also offer the **nuclear magnetic resonance (NMR)** data and relevant structures of the secondary metabolites. This evaluation includes some clinical trial data as well. Researchers could use this review to Phytochemistry. The following active chemical constituents have been reported in *F. racemosa* and their Structures. Few spectral data of active constituents are the various interactions between microorganisms those occur in soil.

KEYWORDS- *Ficus racemosa*, cluster, gular, Antioxidant, phytochemistry.

INTRODUCTION

A significant group of trees, the genus **Ficus** has a variety of chemical components with potential therapeutic benefits. For both Buddhists and Hindus, this tree is revered.

The group "Nalpamaram" is made up of four species from this genus:

F. racemosa, *F. microcarpa*, *F. benghalensis*, and *F. religiosa* (*Athi*, *Ithi*, *Peral*, and *Arayal*, respectively).

F. Glomerata is another name for *Ficus racemosa*. *Ficus racemosa* is also known by a number of synonyms, including **gular**, **Clusterfigtree**, **Countryfigtree**, *Yajnanga*, *Yajniya*, *Yajnayoga*, and *Udumbara*, which is revered by the god *Dattaguru*. It's been utilized in ceremonial offerings.

- ❖ The evergreen, moderately to large-sized, spreading, lactiferous, deciduous tree **Ficus racemosa Linn.** (*Moraceae*) grows to a height of 15–18 m and lacks noticeable aerial roots.
- ❖ According to Berg (1989), the genus *Ficus* is remarkably vast for a pan-tropical, with over 700 species that are extensively spread over the warmer regions of Asia, Africa, America, and Australia. Because of its distinct reproductive strategy, which involves specialized pollinator *wasps* and *synconiafig*, it is kept as a discrete, big genus.
- ❖ Commonly referred to as "gular," *F. racemosa* is used extensively in Ayurveda medicine to treat a wide range of ailments, including biliary disorders, jaundice, dysentery, diabetes, diarrhea, and inflammatory conditions.

India is known for its rich diversity of medicinal plants and hence called botanical garden of the world. Many of the natural products in plants of medicinal value offer us new sources of drugs which have been used effectively in traditional medicine.

F. racemosa is widely grown throughout India and is said to have numerous therapeutic uses.

It is one of the **ksirivrikshalatex** oozes out when the leaves are cut or plucked. It is one of the plants from a group, called *pancavalkala*, meaning the thick bark skins of five herbs, viz. *udumbara*, *vata*, *asvattha*, *parisa* and *plaksa*. The decoction of

pancavalkala is used internally or for giving enema in bleeding per rectum and vagina. Maharishi Charka has categorized udumbara as **mutrasangrahaniya-anti-diuretic herb**.

TRADITIONAL USES

- ❖ **F. Racemosa**, which has been reported to have many medicinal properties, is widely cultivated all over India.
- ❖ Different parts of the plant are traditionally used as fodder, edible and ceremonial.
- ❖ All parts of this plant (**leaves, fruits, bark, latex, and sap of the root**) are medicinally important in the traditional system of medicine in India.

I. LEAVES: -

The leaves make an excellent cleanser for cuts and sores. They help in diarrhea and dysentery. Bark and leaf infusion are also used as a mouthwash for swollen gums and can be taken internally for **menorrhagia, dysentery, glandular swelling, abscess, chronic wounds, cervical adenitis, and hemoptysis**.



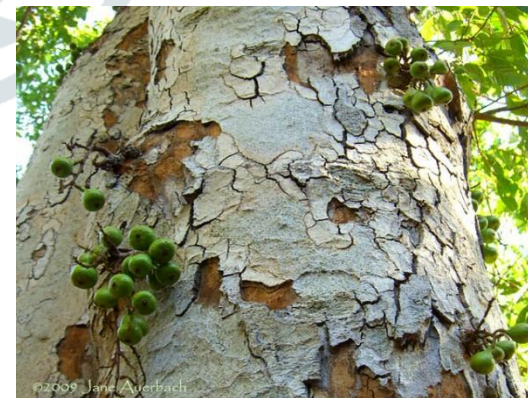
II. FRUITS: -

The fruit is an **astrigent, stomachic, carminative** given in menorrhagia and hemoptysis. Fruits are used as a remedy for **visceral obstruction, diarrhea and constipation**. A bath made of fruit and bark is regarded as a cure for leprosy. The fruit is regarded as a good remedy for **diabetes**.



III. BARK: -

Infusion of bark is used in mouth wash of **spongy gum condition, dysentery, and menorrhagia**. Decoction of bark is used in the washing of wounds, burns, asthma and piles and swelling. It has also great importance in **uropathy** to prevent various urinary tract diseases.



IV. ROOT: -

Diabetes and Gonorrhoea are treated using sap root. The plant sap is a well-liked treatment for **mumps** and other inflammatory swelling. In Sri Lanka – used in the treatment of **skeletal fracture**. In Australian aborigines - used in the treatment of **smallpox, haematuria and menorrhagia**. Used in chronic wounds and malaria in cattle

V. Latex: -

It treats hemorrhoids, boils, edema in adenitis, parotitis, orchitis, traumatic swelling, toothaches, vaginal diseases, diarrhea, especially in youngsters, and it also acts as an **aphrodisiac**.

On chronically infected wounds, latex is externally used to reduce edema, pain, and speed up the healing process. There are reports that **piles** are treated using the latex.

VI. Taxonomy: -

KINGDOM	PLANTAE
DIVISION	MAGNOLIOPHYTA
CLASS	MAGNOLIPSIDA
ORDER	URTICALES
FAMILY	MORACEAE
GENUS	FICUS
SPECIES	RACEMOSA

VII. Microscopical:-

- ❖ The cork is composed of rectangular or polygonal cells.
- ❖ The phenologen consists of one or two layers of cells with thin walls.
- ❖ The phelloderm is a distinct, compact tissue that is primarily made up of parenchymatous cells with sclereids arranged in small, isolated groups, especially in the inner region.
- ❖ Simple pits are used to lignify sclerids.
- ❖ There are several parenchymatous cells with a single prism of calcium oxalate or a brownish substance within them.
- ❖ The cortex has a large number of sclereids and resinous bulk in certain cortical cells.
- ❖ Certain cells contain prismatic crystals of calcium oxalate

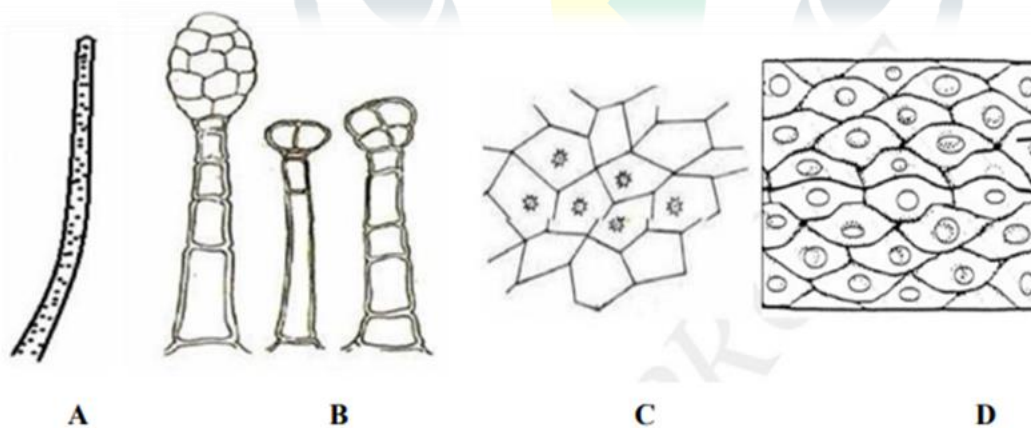
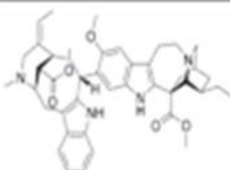
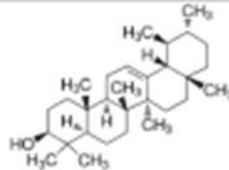
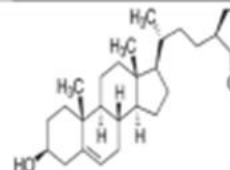
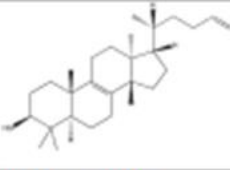
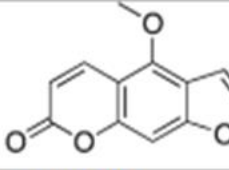
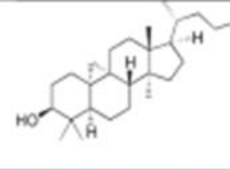
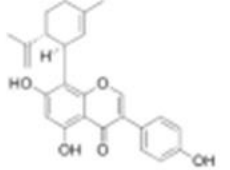
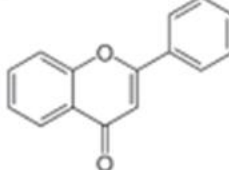
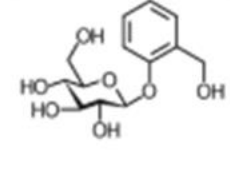
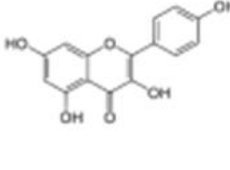
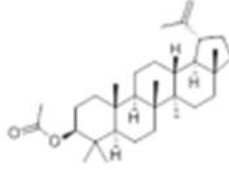
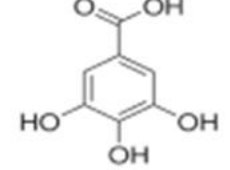
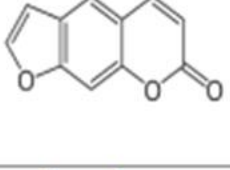
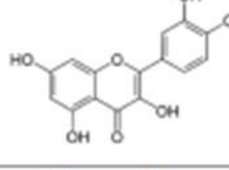
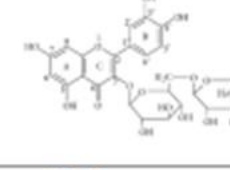
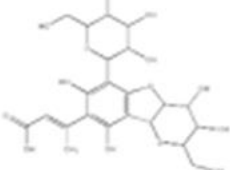
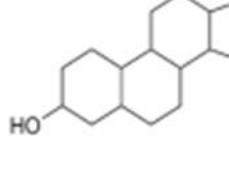
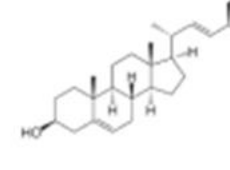


Fig. 2: – A- Fibre, B- Glandular Trichomes, C- Calcium oxalate, D-Stone cells

VIII. Phytochemical of *Ficus Racemosa*: -

- ❖ Triterpenoids, tannins, kaempferol, rutin, arabinose, bergapten, phenolic glycosides, flavonoids, ficusin, coumarin, phenolic glycosides, and saponins are all present in the leaves.

		
a . Alkaloids	b. α- Amyrin	c. β- Sitosterol
		
d. Bergapten	e . Euphol	f. Cycloartenol
		
g . Ficusin	h. Flavonoid	i. Glycosides
		
j. Kempherol	k . Lupeol acetate	l. Phenols
		
m. Psoralen	n. Quercetin	o . Rutin
		
p. Racemosic Acid	q. Sterols	r. Stigmasterol

- ❖ According to Deshmukh, fruits are said to contain sterols, triterpenoids, flavonoids, glycosides, tannins, carbohydrates, β -sitosterol, gluanol acetate, hentriacontane, and tiglic acid.

Pharmacological Activity

1. Antidiuretic: -

- ❖ The antidiuretic action of *F. racemosa* bark decoction has been demonstrated at doses of **250, 500, or 1000 mg/kg** body weight. It began quickly (within an hour), peaked at three hours, and persisted for the whole five-hour study time.
- ❖ Additionally, it resulted in an increase in urine osmolarity and a decrease in urinary Na level and Na/K ratio.

2. Antitussive: -

- ❖ The antitussive activity of *Ficus racemosa* Lin.'s methanol extract of stem bark was evaluated in mice using a model of coughing generated by sulfur dioxide gas.
- ❖ At a dosage of **200 mg/kg**, the extract showed minimal inhibition of **56.9%** after **90 minutes** of administration.

3. Anthelmintic activity: -

- ❖ Using adult earthworms, the anthelmintic activity of crude extracts from the bark of *Ficus racemosa* Lin. was assessed. The results showed that the extracts displayed a dose-dependent suppression of spontaneous motility and evoked responses to pin-prick, which was similar to that of **3% piperazine citrate**.
- ❖ Nevertheless, in the case of worms treated with aqueous extract exhibiting wormicidal action, there was no ultimate recovery.

4. Antibacterial: -

- ❖ *Actinomyces viscosus* was shown to be effectively inhibited by the hydroalcoholic extract of leaves.
- ❖ It was discovered that **0.08 mg/ml** was the minimal inhibitory concentration.

5. Anti - Oxidant Activity: -

- ❖ Both steady state and time-resolved approaches were used to scavenge free radicals from ethanol and water extracts. The steady state antioxidant activity of the ethanol extract was substantially higher.
- ❖ When evaluated with standard chemicals, it also demonstrated concentration-dependent **DPPH, ABTS, hydroxyl and superoxide radical** scavenging, as well as prevention of lipid peroxidation.
- ❖ Using the micronucleus assay, the in vitro radioprotective ability of irradiated Chinese hamster lung fibroblast cells (V79) was investigated.
- ❖ Pre-treatment with various dosages showed a notable drop in the proportion of micronucleated binuclear V79 cells 1 hour before 2 Gy-radiation, indicating its function as a radioprotector.
- ❖ When compared to the methanol extract of its roots, the stem bark methanol extract exhibited strong in **vitro antioxidant activity**.
- ❖ In the DPPH free radical scavenging assay, the ethanol extract of fruits demonstrated strong antioxidant activity **3-O-(E)-Caffeoylquinic acid**

6. Antipyretic: -

- ❖ When administered at doses of **100, 200, and 300 mg/kg** body weight p.o., methanol extract of stem bark significantly reduced both yeast-induced pyrexia and normal body temperature in albino rats up to five hours after the medicine

7. Antidiarrheal: -

- ❖ The antidiarrheal effect of stem bark ethanol extract against several experimental modes of diarrhea in rats was assessed.
- ❖ It demonstrated a strong inhibitory effect on rat enter pooling and castor oil-induced diarrhea.
- ❖ In experiments using charcoal meals, these extracts likewise significantly decreased the gastrointestinal motility of rats. The outcomes demonstrated its effectiveness as an anti-diarrheal administered.
- ❖ The antipyretic effect was similar to what **paracetamol** does.

TOXICITY STUDIES

- ❖ Li and colleagues (2004) assessed the cytotoxic impact of ethanol extracts from *F. racemosa* bark on human skin fibroblasts (1BR3), human hepatocytes carcinoma (HEPG2), and **human promyelocytic leukemia (HL-60) cells** with a density of 1×10^4 cells/mL using an ATP-based luminescent assay.
- ❖ Compared to **aspirin** and **mercuric chloride**, the extract's IC values were much lower at **1.79, 0.098, and 1.69 mg/mL**, respectively. After the evaluated cell lines were exposed to the extract for 48 hours, it was found to be much less hazardous than both aspirin and mercuric chloride.
- ❖ In the brine shrimp lethality test, the bark extracts in water, hydro-alcohol, and alcohol had an LC₅₀ of **850 µg/mL**, indicating that they were non-toxic and suitable for use in traditional medicine. Methanol's acute toxicity.
- ❖ little research has been done on the toxicity of this plant. To yet, the effect of *F. racemosa* on human physiology has only been investigated in one study. The aqueous extract of *F. racemosa* bark was shown to be safe up to a point, beyond which it caused aberrant effects on the kidney and liver.
- ❖ A number of indicators were examined, such as serum glutamate pyruvate trans-aminase, urea, glucose, creatinine, cholesterol, hemoglobin, and red and white blood cell counts. The fact that there haven't been enough studies on the toxicity emphasizes the need for more research on this
- ❖ Previous investigations on albino mice utilizing an aqueous extract of *F. racemosa* bark were conducted to assess acute toxicity. The mice were administered the aqueous extract once at doses of 100, 300, and 1000 mg per 100 gm body weight. After 72 hours, the animals were put to death. Hemoglobin, red blood cell (RBC), white blood cell (WBC), blood urea, blood glucose, serum creatinine, serum cholesterol, and serum glutamate pyruvate transaminase (SGPT) counts were measured on blood samples.
- ❖ The researcher also noted certain physiological alterations in the kidney and liver. Up to the maximum dosage, the extract was safe, although it caused abnormalities in the kidney and liver. The blood sugar level after fasting suggested hypoglycemia.

Conclusion

- ❖ The well-known fig plant, *F. racemosa*, has several pharmacological actions and is used in the Indian Traditional System of Medicine.
- ❖ We have included **the phytochemistry, pharmacology, and traditional use** in a descriptive manner in this review.
- ❖ It has been demonstrated that the phytoconstituents and extracts obtained from this plant elicit a variety of pharmacological reactions, including **analgesic, hypoglycemic, hypolipidemic, hypoglycemic, analgesic, and renal anticarcinogenic effects**.
- ❖ We were able to write this review article because of the pharmacological responses and various traditional uses of *F. racemosa*.
- ❖ *F. racemosa*, the well-known fig plant, is used in Indian Traditional Medicine and has a number of pharmacological actions.
- ❖ Because of *F. racemosa*'s pharmacological responses and range of traditional uses, we were able to write this review article.
- ❖ The genus One significant group of trees with great medicinal value is the ficus family.
- ❖ A variety of parts, including fruit, leaves, stems, and latex, have been suggested for treating different conditions.
- ❖ *Ficus racemosa* exhibited a variety of pharmacological effects.
- ❖ *Ficus racemosa* L.'s bioactive components, such as **β-sitosterol** and **glucanacetate**, have been found to be primarily responsible for its therapeutic potential.
- ❖ To learn more about the potential applications of the bioactive compounds found in this plant that can support its medicinal claims, more research on pathology and clinical settings should be done.

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