WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 17, 364-373. Review Article ISSN 2277–7105

UDUMBARA (*FIGARO RACEMOSA*): A PHARMACOGNOSTIC REVIEW

Anushka S. Deore[1]*, Parth P. Jadhav[2], Hitesh P. Jagtap[3], Ritesh R. Deshmukh[4] and Yash P. Kodilkar[5]

[1]Department of Pharmacognosy K.V.N. Naik Institute of Pharmaceutical Research & Education, Nashik, Maharashtra. India.

[2,3,4,5]Student K.V.N. Naik Institute of Pharmaceutical Research & Education, Nashik, Maharashtra. India.

Article Received on
13 July 2024,

Revised on 02 August 2024,
Accepted on 23 August 2024

DOI: 10.20959/wjpr202417-33750

***Corresponding Author**
Anushka S. Deore
Department of Pharmacognosy K.V.N. Naik Institute of Pharmaceutical Research & Education, Nashik, Maharashtra. India.

ABSTRACT

Ficus racemosa Linn. diabetics, antioxidant, antioxidant, anti-radical. A wide variety of phytochemical constituents have been identified and isolated from *F. racemosa* parts with hepatoprotective and antimicrobial activities. This review provides a detailed account of its traditional uses, phytochemical constituents and medicinal effects in light of the many effects recently discovered related to the importance of this plant.

KEYWORDS: Fig, *Ficus racemosa*, antioxidant, toxicity, phytochemical.

INTRODUCTION

Figaro racemosa, famously known the clunky fig tree or goblet fig, it is an Indian subcontinent and Southeast Asia. Not only this, it is a large deciduous tree that has distinctive fig clusters growing directly on the trunk and big branches. It has traditionally been uses in different medical systems, including Ayurveda, for its medicinal properties. In pharmacy, *Figaro racemosa* can be used in many ways. Here's a more detailed review that focuses on characteristics, traditional use, and potential applications.

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.

Fig 1: Fruits, trunk of Ficus racemosa.

PHYSICAL CHARACTERISTICS

The *Ficus racemosa* grows to be a large, spreaded tree that reached 30 meters around height. Its leaves are elliptical or oval shape, with a pointed peak and a smooth or kind of serrated border. The figs of *Ficus racemosa* starts out small and green, then turns purple when they ripe, they grow in dense bunches right on the trunk and really old branches. This tree is famously known for wide roots system, helping in soil stabilization and avoiding erosion. *Ficus racemosa*, one of those fig plants, is called the red river fig or gular, belongs to the Moraceae family. Originated in Australia and tropical Asia. A truly quickly growing plant with big, super rough leaves, sometimes looking like a giant shrub, but the old ones truly get huge and gnarly.

MICROSCOPICAL CHARACTERISTICS

The cork it's composed of polygonal or rectangular cells. The phellogen it's made of 1-2 layers of thin-walled cells. Phelloderm is well marked compact tissue made up mainly of parenchyma's cells with isolated or small groups of sclereids, especially in the inner region. Sclereids they are lignified with simple points. Several parenchymatous cells they have single prism of calcium oxalate or some brownish content. The cortex it is wide with numerous sclereids and some cortical cells they have resinous mass. Crystal prims late of calcium apple sulphate be being in many of cell. Sclereids be is rectangular a pitting thick wall. Phloem be made up of sieve tubes, companion cells, phloem parenchyma, sclereids, phloem fibres, and medullary rays. Starch grains be like ovoid to spherical, kind of. Laticifers vessels has this light brown granular stuff in the phloem region, yeah. Cambium be there like in 2-3 layers of tangentially elongated thin-walled cells, sort of. Figs be smooth or sometimes with tiny soft hair.

POTENTIAL PHARMACY APPLICATIONS

Stomach Disorders

Ficus racemosa is habitually utilized to manage stomach problems like diarrhoea and dysentery. Possibly having protective effects and aiding in managing gastrointestinal concerns.

Breathing Issues

Traditional treatments involving *Ficus racemosa* are employed for respiratory infections and conditions like coughs and asthma.

Diabetes Regulation

Certain studies propose that *Ficus racemosa* may have hypoglycaemic effects, suggesting its potential in diabetes management.

Antioxidant and Anti-inflammatory Properties

The tree's extracts could own antioxidant and anti-inflammatory properties, which may be advantageous for overall health and managing inflammatory conditions.

Wound Healing

Extracts from *Ficus racemosa* are topically utilized for wound recovery due to their mentioned antibacterial and anti-inflammatory attributes.

Traditional Uses

In traditional medicine methods like Ayurveda, *Ficus racemosa* has been utilized for various therapeutic intentions. It is thought to possess characteristics such as anti-inflammatory, anti-microbial, antioxidant, and anti-diabetic effects. Distinct parts of the tree, such as bark, leaves, and fruits, latex are used in traditional remedies.

Bark

The barking are a stringent. An inform of bark is employed like mouth blink in spongy gum condition, dysentery, menorrhea, haemoptysis, and diabetes. Is also used as a wash for wounds, highly efficacious in threatened abortions and also recommend in uropathy. The bark be decoctioned is giving in piles and asthma. The sap extract from the trunk have describe as valuable medicine in diabetes. The paste of stem bark are use in burns, swelling, leucorrhoea, dysentery and diarrhoea.

Leaves

Leaves powder mixed with sweet honey be utilized in liver infections. Leaf decoction is employed as a douche in painful menstrual cramps, also as a rinse for injuries plus sores. Juicy leaves are rubbed on hair to stop breakage. Leaf liquid rubber is utilized for abscesses, sores as well as chickenpox.

Fruit

The fruit was being an astringent stomachic, carminative giving in menorrhea and hemoptysis. Fruits used as a remedy for visceral obstruction, diarrhoea and constipation. A bath made of fruit and bark is viewing as a cure four leprosy. The fruit is considered a go remedy four diabetes. [Fig.1]

Latex

Latex be aphrodisiac and administered boiling, diarrhoea, dysentery, and haemorrhoids. It also used to cure stomach ache, cholera, and mumps as reported in the indigenous system of medicine in Sri Lanka for treating skeletal fractures to control severe diarrhoea, especially in children. Latex be used as an adhesive.

BIOACTIVE COMPOUNDS IN FRESH FIG FRUIT AND FRUIT PRODUCTS

Fruits and vegetables are colourful, fun and nutritious additions to our diet. Because of their potential health benefits, bioactive compounds in fruits and vegetables such as polyphenols,

carotenoids, vitamins and anthocyanins are gaining more attention. Fruits and vegetables rich in foods can help slow the aging process and help reduce the risk of develop cancer, heart disease and other chronic diseases.

Ascorbic Acid

The vitamin plays an important role in the immune system, detoxification, iron absorption, wound healing, orthogenesis, collagen biosynthesis, prevention of blood vessel contraction, and various physiological processes of the ongoing Realistic ascorbic acid concentration with respect to species, environmental conditions, harvest time, processing methods, growth, and storage conditions Different extraction methods is based on reliability, consistency, and also affects vitamin C content. Ascorbic acid has important roles in human health including chronic human diseases like scurvy, oxidative stress-induced DNA mutations, some tumors, myocardial infarction, atherosclerosis, glaucoma and kidney disease etc. Vitamin C also strengthens the human immune system. It inhibits the formation of nitrosamines and blocks the chemical stimulation of the cancer. Vitamin C is one of the most important vitamins in humans, as it is involved in many body processes and functions. Collagen or connective tissue is the most abundant tissue in the human body. Collagen protects against diseases and pollutants in the human body. Vitamin C is an important antioxidant. Even at low doses, vitamin C can protect vital molecules such as amino acids, lipids, carbohydrates, nucleic acids and others from free radicals and oxygen species production work caused by exposure to toxins and pollutants (e.g. smoking).

Flavonoids

Flavonoids are compounds found in a wide variety of food plants, fruits, vegetables, and grains, and are an obligatory and essential part of the human diet. Flavonoids have been synthesized with foods containing them (wine, tea, soybean, and liquorice). Research for possible health benefits due to their antioxidant activity and oxidative by stress (atherosclerosis, cancer, Parkinson's, and diabetes). The rich colour of the flowers and flavonoids from the *Ficus* genus, the fruits and leaves have biological activities such as carcinogenic, anti-inflammatory and anti-atherosclerotic The main flavonoids found in figs are quercetin and luteolin, 631 in total and 681 mg/kg respectively. The major (non-glycosylated) flavonoid compound in grapefruit is found to be luteolin (187 mg/kg extract). Luteolin was identified as the most abundant flavonoid in fig leaves. Another flavonoid found in the figure, but to a lesser extent, was biochanin A, which was mostly found as a free

aglycone. *Ficus ceratonia* is rich in flavonoids and also high in the important isoflavone, genistein reported the presence of flavonoids, alpha-tocopherol, phenolic acids, and sesquiterpenes in the leaves of *Ficus carica* and organic acids in its latex. The flavonoid content of hot and cold water extracts of *Ficus deltoidea* is given as mg fresh weight catechin equivalent (CE)./g. This study found that the total flavonoid content of hot water extracts ranged from 17 to 66 mg CE/g fresh weight, while the flavonoid content of six *Ficus carica* strains was measured calorimetrically from 18 to 52 mg CE/fresh weight of water cold extract m. Most of the flavonoids are found in fruit skin. Total flavonoids from 2.1 mg/100 g in *Ficus carica* followed by 15.9 mg/g in Chechik, 3.6 mg/g in Brown–Turkey, 2.7 mg/g in Bursa and 2.3 mg/g in Brunswick were 100 g, and 1 mg /100 g kadota. The flavonoid content of dark-colored grapes was significantly higher than other varieties because the skin is the main tissue producing flavonoid levels. Determination of total flavonoid content in seven Ficus species (*Ficus. benghalensis, Ficus. decora, Ficus. hawaii, Ficus. virens, Ficus. fatiphila, Ficus. retusa, and Ficus sycamorus*) by developed aluminum chloride colorimetric method modification on Extracts as follows The content of dried pepper varieties using the -flavonoid method ranged from 1.85 to 12.46 mg/g. Potential biological activities of flavonoid derivatives in grapefruit.

Carotenoids

Carotenoids are clearly taking place compounds plentiful in vegetation and are accountable for the shade of the Ficus genus. Carotenoid molecules are antioxidants, guard cells from oxidative strain, and may slow the getting old manner through eating reactive oxygen species. Cryptoxanthin, α-carotene derivatives, and β-carotene Ficus carica the determined the carotenoid Zeaxanthin, lutein, a-carotene, lycopene, β-carotene, and cryptoxanthin well Lycopene is the maximum ample carotenoid with lutein, β-carotene, α-carotene, and cryptoxanthin comply with in *F. Carica* “Sarizeybek” and “ Sarilop,”, which had been studied showed that lutein is the principal carotenoid determined in clean figs at the side of zeaxanthin, β-cryptoxanthin, and approximately β-1.Total carotenoid content of dried figs carotene is substantially higher than apricot, dried prunes and figs.Fruit skin is a major supply of carotenoids, while little or no is located in fruit. Heat remedy has broadened the release effect of these compounds, and the antioxidant impact is associated with the carotenoid content material. The removal efficiency of carotenoids is decreased due to the presence of water on the foundation surface.

Other uses

The barking of *Ficus racemosa* are being use like a home remedy. In America, a bark is rub on a rock with water for make a paste, that may be apply to boils or bug bites. Permitting the paste to dry on the skin and reapplying later. The roughness leaves of the plants might also apply for extract caterpillar brushes stuck in skin. A usual folk remedy is to rub the impacted place slight with a leaf that works superbly.

PHYTOCHEMISTRY

The leafs contains of triterpenoid, tannins, kaempferol, rutin, arabinose, bergapten, psoralenes, flavonoids, ficusin, coumarin, phenolic glycosides; and saponins. Fruits are reportedly to contain sterols, triterpenoids, flavonoids glycosides, tannins, carbohydrates β-sitosterol, gluanol acetate, hentriacontane, tiglic acid of taraxasterol lupeol acetate, gallic acid, ellagic acid and α-amyrin acetate.Stem bark contains steroids, alkaloids, tannins, gluanol acetate, leucocyanidin-3-O-β-D-glucopyrancoside,leucopelargonidin-3-O-β-D-glucopyranoside, leucopelargonidin-3-O-α-L-rhamnopyranoside, ceryl behenate, lupeol acetate, α-amyrin acetate, lupeol, friedelin, behanate, stigmasterol, β-sitosterol, β-sitosterol-D-glucoside, gluanol acetate, and quercetin, Bergenin, racemosic acid, β-sitosterol, β-amyrin, and lupeol acetate have been isolated from the bark of *F. racemosa*.

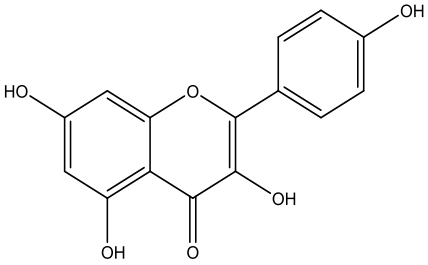

Fig 2: Kaempferol.

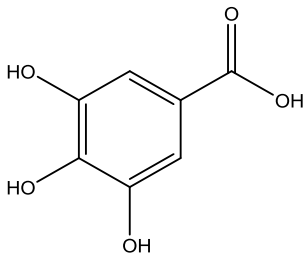

Fig 3: Gallic acid.

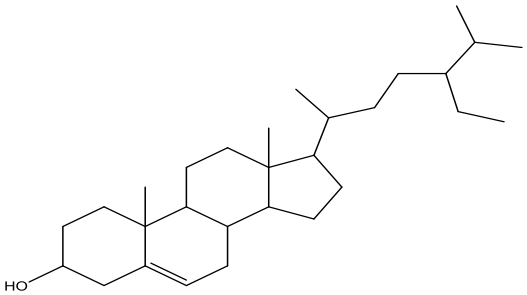

Fig 4: *β-Sitosterol.*

Toxicity Studies

Investigated the cytotoxic effects of ethanol. Use of *F. racemosa* bark extracts using an ATP-based luminescence sense assay on human skin fibroblasts (1BR3), human. Hepatocytes carcinoma (HEPG2) and human promyelocytic leukaemia (HL-60) are 1x 104 cells/mL. The extracts showed IC50 values of 1.79, 0.098, and so on 1.69mg/mL, respectively, which was significantly lower than aspirin and mercury chloride. Excerpts from the text and much less toxic than aspirin and mercury Chloride after 48h of exposure of the tested cells. Water/water-alcohol/alcoholic extracts. The brine shrimp showed an LC50 of 850 µg/mL in the mortality experiment. Making him non-toxic and proving him safe. It is used in traditional medicine. Acute toxicity of methanol extracts from the stem bark. *F. racemosa* was examined and studied in albino mice. The extract was shown to be safe even at high concentrations of 3.2 g/kg, while petroleum ether. *F. racemosa* fruit extracts did not produce toxicity even at a dose of 5 g/kg in rats. Paper reported that water-ethanol extracts (50%) fruit is non-toxic and harmless, as in any death or behavioural changes were observed in mice. The Letter abstract also did not affect behavioural functioning either showed no signs of acute toxicity in rats reported LD50 values of >10 g/10. kg bw for petroleum ether and ethanol extracts from F. race mosa leaves, and a value of >5 g/kg bw for water draw. All these findings consider aspects Non-toxic and safe bark of *F. racemosa* (main plant) to have some for people to eat Miscellaneous Heath Benefit.

CONCLUSION

The path of chemistry spans loads of chemistry topics including history, sources, bodily, chemical composition, mechanisms of movement, absorption, distribution, biotransformation, excretion, and including the take a look at of "drugs" in therapy. In many approaches, medical studies into herbs is just beginning. This have a look at leaves no doubt that *F. racemosa*, a flexible medicinal plant, is being investigated for lots organic sports. Very vital studies have already been done in the last few a long time to discover the botanical and biological sports of diverse elements of *F. Racemosa* is a unique source of a huge range of compounds with special chemical properties in. Very little paintings has been finished on biological programs and practical pharmacological applications of those compounds and consequently massive research is needed to exploit their healing benefits to combat diseases. Aqueous extracts have additionally been marketed. Extensive research and development need to be executed for use in monetary remedies.

REFERENCES

1. N. Y. Gond, S. S. Khadabadi, "Hepatoprotective activity of Ficus carica leaf extract on rifampicin-induced hepatic damage in rats," Indian Journal of Pharmaceutical Sciences, 2008; 70(3): 364–366.
2. S. Mohamad, N. M. Zin, H. et al., "Antituberculosis potential of some ethnobotanically selected Malaysian plants," Journal of Ethnopharmacology, 2011; 133(3): 1021–1026.
3. F. Liu, Z. Yang, et al., "Nematicidal coumarin from F. carica L," Journal of Asia-Pacific Entomology, 2011; 14(1): 79–81.
4. S. D. Yancheva, S. Golubowicz, et al., "Efficient agrobacterium-mediated transformation and recovery of transgenic fig (Ficus carioca L.) plants," Plant Science, 2005; 168(6): 1433–1441.
5. F. Aside, M. Pourkabir, et al., "Alterations to lipid parameters in response to fig tree (Ficus carica) leaf extract in chicken liver slices," Turkish Journal of Veterinary and Animal Sciences, 2006; 30(3): 315–318.
6. M. Viuda-Martos, X. Barber, et al., "Assessment of chemical, physico-chemical, techno-functional and antioxidant properties of fig (Ficus carica L.) powder co-products," Industrial Crops and Products, 2015; 69: 472–479.
7. J. J. K. Bankeu, R. Khayala, et al., "Isoflavone dimers and other bioactive constituents from the figs of Ficus mucuso," Journal of Natural Products, 2011; 74(6): 1370–1378.
8. F. C. Stintzing, R. Carle, "Functional properties of anthocyanins and betalains in plants, food, and in human nutrition," Trends in Food Science & Technology, 2004; 15(1): 19–38.
9. S. K. Al-matani, R. N. S. Al-Wahaibi, et al., "In vitro evaluation of the total phenolic and flavonoid contents and the antimicrobial and cytotoxicity activities of crude fruit extracts with different polarities from Ficus sycomorus," Pacific Science Review A: Natural Science and Engineering, 2015; 17(3): 103–108.
10. Z. Abdullah, K. Hussain, et al., "Anti-inflammatory activity of standardised extracts of leaves of three varieties of Ficus deltoidea," International Journal of Pharmaceutical and Clinical Research, 2009; 1: 100–105.
11. M. Hakiman, M. Maziah, "Non enzymatic and enzymatic antioxidant activities in aqueous extract of different Ficus deltoidea accessions," Journal of Medicinal Plant Research, 2009; 3(3): 120–131.

12. A.Slatnar, U. Klancar, et al., "Effect of drying of figs (Ficus carica L.) on the contents of sugars, organic acids, and phenolic compounds," Journal of Agricultural and Food Chemistry, 2011; 59(21): 11696–11702.
13. P. Oliveira, L. R. Silva, et al., "Chemical assessment and in vitro antioxidant capacity of Ficus carica latex," Journal of Agricultural and Food Chemistry, 2010; 58(6): 3393–3398.
14. M. Gregory, K. P. Vithalrao, et al., "Anti-ulcer (Ulcer-Preventive) activity of Ficus arnottiana miq. (Moraceae) leaf methanolic extract," American Journal of Pharmacology and Toxicology, 2009; 4(3): 89–93.
15. A. De Amorin, H. R. Borba, et al., "Anthelmintic activity of the latex of Ficus species," Journal of Ethnopharmacology, 1999; 64(3): 255–258.
16. Solomon, A., Golubowicz, S., et al., Antioxidant activities and anthocyanin content of fresh fruits of common fig(Ficus carica L.). J. Agric. Food Chem, 2006; 54: 7717–7723.
17. C -aliskan, O.; Aytekin Polat, A. Phytochemical and antioxidant properties of selected fig(Ficus carica L.) accessions from the eastern Mediterranean region of Turkey. Sci. Hortic, 2011; 128: 473–478.
18. A. Kar, B. K Choudhary, et al., comparative evaluation of hypoglycemic activity of some Indian medicinal plants in alloxan diabetic rats, J Ethno pharmacol, 2003; 84(1): 105-108.
19. S. A Deraniyagala, R. L. C Wijesundera, et al., Journal of the National Science Council of Sri Lanka, J. Natl. Sci. Counc, Sri Lanka, 1998; 26(1): 19-26.
20. R. B Rao, K. Anupama, et al., Evaluation of antipyretic potential of Ficus racemosa bark, Phytomedicine, 2002; 9: 731-733.
21. A. P Breen, J. A Murphy, Reactions of oxyradicals with DNA, Free Rad Biol Med, 1995; 18: 1033–1077.
22. W. D Ratnasooriya, J. R Jayakody, et al., Antidiuretic activity of aqueous bark extract of Sri Lankan Ficus racemosa in rats, Acta Biol Hungary, 2003; 54: 357-363.
23. A. Husain, O. P Virmani, et al., Dictionary of Indian Medicinal Plants, CIMAP, Lucknow, India, 1992; 546.
24. J. Vaya, S. Mahmood, et al., "Flavonoid content in leaf extracts of the fig (Ficus carica L.), carob (Ceratonia siliqua L.) and pistachio (Pistacia lentiscus L.)," BioFactors, 2006; 28(3-4): 169–175.
25. G. M Balestra, A Rossetti, et al., "Biological control of kiwifruit and tomato bacterial pathogens," in Proceedings of the 16th IFOAM Organic World Congress, Modena, Italy, June 2008.