ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 14, Issue, 02, pp. 65041-65048, February, 2024
https://doi.org/10.37118/ijdr.27899.02.2024

RESEARCH ARTICLE OPEN ACCESS

PHYTOCHEMICAL PROFILE: A *Ficus racemosa* Linn.

Raman Chandak* and Sneha Chatap

School of Pharmacy, Government Hospital, Raisoni University Saikheda, M.P. India

ARTICLE INFO

Article History:
Received 20th January, 2024
Received in revised form
29th January, 2024
Accepted 01st February, 2024
Published online 28th February, 2024

Key Words:

Ficus racemosa, Cardioprotective, Anticarcinogenic, glunol-OAc, leucocunedin.

Corresponding author: Raman Chandak

ABSTRACT

Ficus Racemosa is an important medicinal plant, found in India, Australia, and Southeast Asia. It is popularly known as 'gular.' It reduces blood glucose concentration due to the presence of β-sitosterol. Many active constituents that have been isolated from various parts of this plant possess useful pharmacological activities. The objective of this dissertation is to identify the biological activity of the roots of an indigenous medicinal plant, viz., Ficus racemosa (Family: Moraceae) and to evaluate the possible phytochemical and pharmacological profiles of the crude extracts. So far, some chemical and biological investigations have been carried out on this plant mainly focusing on the bark and root of the plant. That's why the goal of this framework is to explore the potential possibilities of developing new drug candidates from the fruit of this plant which could be crucial for the treatment of various ailments. Root bark, leaves fruit and galls are part of tree used for therapeutic activity. Bark, leaves and unripe fruits having various pharmacological activity like Antibacterial Activity, Analgesic activity, Anti-inflammatory Activity, Cardioprotective Activity, Hepatoprotective Activity, Anti-filaria, Anthelmintic, Renal Anticarcinogenic, carminative, astringent, stomachic and vermicide character. The chief chemically constitutes are gluanol acetate, beta-sitosterol, leucocynedin and leaf chemically contain beta-amyrin, beta-sitosterol and tannin. Fruit chemically contain lupeol-OAc, glucose, sterol and gluanol-OAc.

Citation*: *Raman Chandak and Sneha Chatap, 2024. *"Phytochemical profile: a Ficus racemosa Linn.". International Journal of Development Research*, 14, (02), 65041-65048.

INTRODUCTION

India has an ancient heritage of traditional medicine. The material medica of India provides a great deal of information on the folklore practices and traditional aspects of therapeutically important natural products. Indian traditional medicine is based on various system including Ayurveda, Sidha , Unman and Homeopathy. The evaluation of these drug is primarily based on phytochemical, pharmacological and allied approaches including various instrumental techniques such as chromatography, microscopy and others. With the emerging worldwide interest in adopting and studying traditional systems and exploiting their potential based on different health care systems, the evaluation of the rich heritage of traditional medicine is essential.

Ficus Racemosa

Name of plant : Ficus Racemosa
Family : Moraceae
Plant part : Flower

Ficus Recemosa Lin is a large dedicious tree distributed throughout India particularly in evergreen forests and moist localitie. Root bark, leaves fruit and galls are part of tree used for therapeutic activity. Bark, leaves and unripe fruit are carminative, astringent, stomachic and vermicide. As mentioned in the Ayurvedic Nighanthus that the infusion of the bark, fruit and leaves is cooling, sweet and astringent. The bark chemically constitutes of gluanol acetate, beta-sitosterol, leucocynedin and leaf chemicallycontain beta-amyrin, beta-sitosterol and tannin. Fruit chemically contain lupeol-OAc, glucose, sterol, and gluanol-OAc. 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. Ficus racemosa Lin hasvarious synonyms like Udumbara, yajnanga, yajniya, ajnayoga, yajnyasara, gular, Cluster Fig tree, Country fig tree etc. It has been used in ritual sacrifice. It is one of the ksiri vriksa – latex 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 mutra sangrahaniya – anti-diuretic herb.

Taxonomic Classification of Ficus racemosa Linn.

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnolipsida
Order	Urticales
Family	Moraceae
Genus	Ficus
Species	Racemosa

Vernacular Names of Ficus racemosa Linn.

Scientific Name: Ficusracemosa
Synonyms: Ficusracemosa var. mollis, Ficusglomerata
Bengali: Dumor, উদুম্বর,Udumbara
English: Gular fig, Country Fig, Cluster Fig
Gujarati: Goolar, Umbaro
Hindi: Dumar, Jantu Peal, Goolar, Goolar, Pani Bhuj, Pushp-hina, Udumbara, Dharma Patra, Umari

General Approaches to Drug Discovery from Natural Sources:
In general, three different approaches have been, and continue to be used in the drug discovery process from natural sources. These approaches are: traditional empirical and molecular. During the Vedic period the 'Susrutasamhita' and the "charakasamhita" were influential works on traditional medicine. Hundreds of medicinal plant were identified and have been traditionally used since then. Over the following centuries, Ayurvedic practitioners developed a number of medicinal preparations and surgical procedures for the treatment of various ailments and diseases. WHO (World Health organization) estimates that 80% of the populations living in the developing countries rely exclusively on traditional medicine for their primary health care needs. In almost all the traditional medicine, the traditional plants play a major role and constitute the backbone of the traditional medicine. Indian Materia medical includes about 1600 drugs of vegetable origin almost all of which are derived from different traditional system and folklore practices. Examples include drugs like morphine, quinine and ephedrine that have been in widespread use for a long time, and more recently adopted compounds such as the antimalarial artemisinin. The empirical approach builds on an understanding of a relevant physiological process and often develops a therapeutic agent from a naturally occurring lead molecule. Examples include tubocurarine and other muscle relaxants, propranolol and other β-adrenoreceptor antagonist. Development of molecular biological techniques and the advances in genomics lead to molecular approach. The molecular approach to drug discovery can be further subdivided into three general categories. The first is rational drug design using computer aided techniques. A second area is the antisense approach, which is based on manipulation of genetic targets. The third technique, which currently dominates drug discovery activity, is the pragmatic approach of random screening. With recent technological developments in molecular biology, instrumentation and information technology, screening of compounds can be conducted by high throughput screening method.

Medicinal plants and drug development

Development of drugs from medicinal plants is often an elaborate laborious time consuming and expensive exercise. Careful phytochemical analysis and pharmacological and clinical tests are pre-requisites for developing drugs from medicinal plants. The stage involve in the following way development exercise may be summarize as follows:

(i) Selection and correct identification of the proper medicinal plants and its extraction with a suitable solvent.
(ii) Detection of biological activity of the crude extent and establishment of a bioassay system to permit the identification of the active fractions and rapid discarding of the inactive ones.
(iii) Fraction of the crude extracts by using Physico-chemical procedure and monitored by biological tests identification and separation of the active fractions.
(iv) Isolation of the active constituents by chromatographic or other technique and purification of the isolation compounds by repeated chromatography and crystallization.
(v) Establishment of the chemical structures of the pure compound by various physicochemical techniques and determination of their biological activity by various pharmacological tests.

Contribution of medicinal plants to modern drug

Plants have contributed and are still contributing to the development of modern synthetic drugs and medicine in a number of ways as stated below:

I. Novel structure of biologically active chemical compounds isolated from plants sources, often to prompt the chemists to synthesis similar or better semi —synthetic compounds.
II. Synthetic drugs with similar or more potent therapeutic activity are often prepared by structural modification of the plant derived compound with known biological activity.
III. Chemists for use as potent drugs often prepare various analogues of derivatives of plant constituents with similar or better pharmacological action and therapeutics properties.

Homatropine (a synthetic tropane alkaloid similar to atropine) syrosingopine (a synthetic derivative of reserpine) chloroquine (a synthetic derivative of quinine) dihydromorphinone, oxymorphine, methyldihydromorphinone, ethyl morphine and N-allylnormorphine (synthetic derivatives of morphine) are some of the example of such synthetic drug which plants have contributed indirectly. Even in this age of synthetic drug there are some naturally occurring drugs, such as the Digitalis glycoside used in cardiac complications and the

Behavior of the Ficus racemosa Linn. bark powder with different chemical reagents

S.No.	Reagent	Colour / Precipitate	Result
1.	Picric acid	No precipitation	Alkaloids absent
2.	Coc.H2So4	Reddish brown	Steroids / tri terpenoids present
3.	Aq.FeCl3	Greenish black	Tannins, flavonoids present
4.	Iodine solution	Blue	Starch
5.	Ammonia solution	No change	Anthraquinone glycoside absent
6.	5% Aq. KOH	No change	Anthraquinone glycoside absent
7.	Mayer's reagent	No precipitation	Alkaloids absent
8.	Spot test	Stain observed	Fixed oil present
9.	Aq.AgNO3	Precipitation Observed	Proteins present
10	MG-HCL	Magenta	Flavonoids present
11.	Dragendrorff's reagent	No precipitation	Alkaloid absent
12.	Aq Lead acetate	White precipitation	Tannins present
13.	Libermann Burchard test	Redidsh green	Steroid/Triterpinoids present

Some Crude Drugs Used as Medicine India

Plant	Biological Source	Plant part in use	Important content	Use
Punarnava	Boerhaavia diffusa	Root	Alkaloids, Xanthenes, Ursolic acid	Diuretic, useful in nephritic syndrome, chronic edema and liver diseases
Vasaka	Adhatoda Vaska	Dried/Fresh Leaves	Vasicine, Vasicinone (alkaloid)	Cough & cold, chronic bronchitis & asthma, expectorant
Anantamul	Hemidesmus indicus	Root	Essential Oil, Saponin, Resin, Tannins, Sterols and glucosides.	Tonic, diuretic, demulcent, diaphoretic, carminative
Arjun	Tarminalia arjuna	Leaves and bark	Tannins, β-sitosterols, saponin	As cardio tonic in angina pain, diuretic in palpitations
Chirata	Gentiana chirayita	Entire dried plant	Gentiopicrin [bitter glycosides]	Bitter tonic, febrifuge, stomachic & laxative
Picrorrhiga	Picrorhiga	Dried rizomes	Picrorhigin (Glycoside)	Bitter tonic, cathartic, stomachic used in dyspepsia, anti-periodic & colagogue
Kalomegh	Andrographis paniculata	Leaves or entire aerial part	Kalmeghin (bitter crystalline diterpin lactone)	Febrifuge, astringent, anthelmintic. Useful in cholera, piles, gonorrhea, dyspepsia and general weakness
Amla [Triphala]	Phylanthus emblica	Dried fruit	Vit C (20 times more than in orange)	Cooling, refrigerant, diuretic & laxative, promotes hair growth
Bahera	Terminalia belerica	Dried ripe fruite	20% tannins, phyllembin, mannitol	Bitter tonic, astringent, laxative, antipyretic used in dysentery, piles, leprosy
Haritaki	Terminalia Chebula	Fruit	Triterpenes & conjugated coumarins	Carminative, appetite stimulant used in leprosy, anemia, piles, intermittent fever, heart disease diarrhea
Tulsi	Ocimum sanctum	Leaves	Eugenol (essential oil), carvacrol	Expectorant, diaphoretic, antiperiodic, antiseptic & spasmolytic
Neem	Azadiachta Indica	Leaves and seed oil	Nimbin, nimbinene, nimbandiol (indole alkaloids)	Stimulant, antiseptic used in rheumatism & skin diseases.
Garlic	Alium sativum	Bulb	Designated allicin	Used in hypertension, stimulating bile
Spirulina	Spirulina maxima	Blue-green algae	Protein and Vit B12	Weight loss
Ginseng	Panax quinquefolius	Root	Complex mixture of triterpenoid saponins	Aphrodisiac
Aloe	Aloe barbadensis	Dried latext juice of leaves	Barbaloin (anthraquinine glycosides)	Benzoin tincture, cathartic

Catharanthus alkaloids used in cancers, which have no synthetic alternatives. In such cases plants continue to remain as their principal and oily sources.

Chemical constituents of medicinal plants

The commonly occurring chemical substances which are responsible for the medicinal (as well as toxic) properties of plants include the following

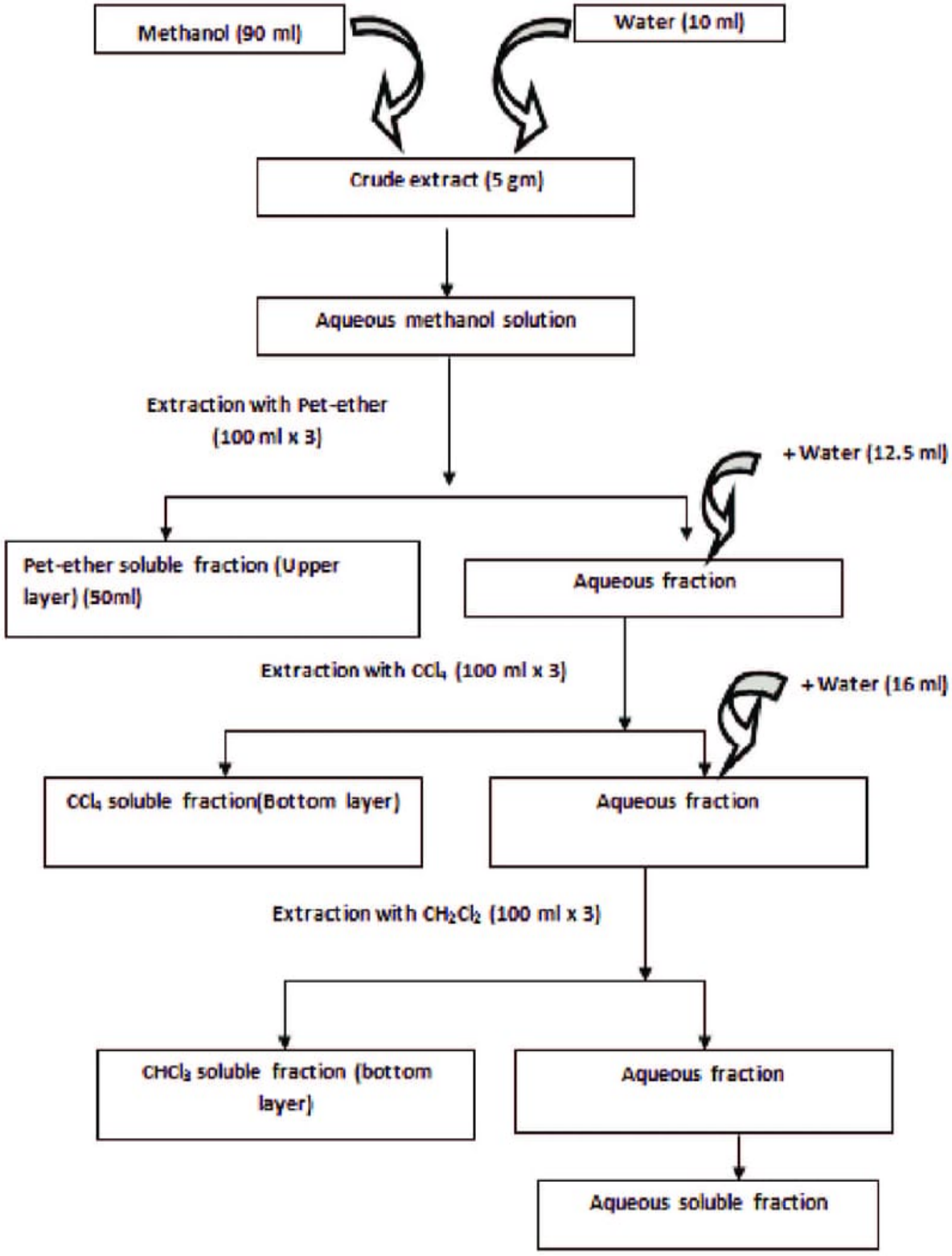
1. Volatile or essential oils
2. Fixed oils
3. Gum-resins and mucilage
4. Alkaloid and amines : Pyridine group ,Tropane group ,Isoquiloline group ,Quinoline group Quinolizidile group , Indole group , Steroidal group , Phenylethylamine group , Alkaloid amines
5. Glycosides: Anthraquinone glycoside , Cardiac glycoside , Saponin glycoside Thiocyanate glycoside , Other glycoside
6. Vitamin and mineral.

Plant Preview

Plant Description: [*Ficus Rasemosa*]

Ficus racemosa, 20 to 30 m high; bole buttressed; bark 8-10 mm thick, surface reddish-brown or yellowish-brown smooth, coarsely flaky, fibrous; blaze creamy pink; latex milky; young shoots and twigs finely white hairy, soon glabrous; branchlets 1.5-3 mm thick, puberulous. Leaves simple, alternate, stipules 12-18 mm long,

Flow Chart of Bioactivity Guided Phytochemical Approach



lanceolate, linearlanceolate, pubescent, often persistent on young shoots; petiole 10-50 mm long, slender, grooved above, becoming brown scurfy; lamina 6-15 x 3.5-6 cm, ovate, obovate, ellipticoblong, elliptic-lanceolate, elliptic-ovate or oblongovate, base acute, obtuse or cuneate, apex narrowed, blunt or acute, margin entire, membranous, glabrous, blistered appearance on drying; 3-ribbed from base, 4-8 pairs, slender, pinnate, prominent beneath, intercostae reticulate, obscure. Flowers unisexual; inflorescence a syconia, on short leafless branches or warty tubercles of trunk or on larger branches, subglobose to pyriform, smooth, often lenticellate - verrucose; peduncle 3-12 mm long, stout, orifice plane or slightly sunken, closed by 5-6 apical bracts; internal bristles none; basal bracts 3, 1-2 m long, ovatetriangular, obtuse, persistent; flowers of unisexual, 4 kinds; male flowers near the mouth of receptacles, in 2-3 rings, sessile, much compressed; tepals 3-4, dentate-lacerate, lobes jointed below, red, glabrous; stamens 2, exserted; filaments 1 mm, connate below; anthers oblong, parallel; female flowers sessile or very shortly stalked among gall flowers; tepals 3-4, dentate-lacerate, lobes jointed below, red, glabrous, ovary superior, sessile or substipitate, red spotted; style 2- 3 mm long, glabrous, simple; stigma clavate; gall flowers long

stalked; ovary dark red, rough; style short [32]. Syconium 2.5 x 2 cm, orange, pink or dark crimson; achene granular

The plant family: Moraceae

Slightly bitter Ficus racemosa is an attractive fig tree with a crooked trunk and a spreading crown. Unlike the banyan, it has no aerial roots.

Leaves: The leaves are dark green, 6-10 cm long, glabrous; receptacles small subglobose or piriform, in large clusters from old nodes of main trunk.

Fruits: The fruits receptacles are 3-6 cm in diameter, pyriform, in large clusters, arising from main trunk or large branches.

Flowers: Looking for the flower of Ficusracemosa should know that the fig is actually a compartment carrying hundreds of flowers. One might wonder how these flowers enclosed in a ball are pollinated.

Seeds: The seeds are tiny, innumerable and grain-like. Outer surface of the bark consists of easily removable translucent flakes grayish to rusty brown, uniformly hard and non-brittle.

Bark: Bark is reddish grey or grayish green, soft surface, uneven and often cracked, 0.5-1.8 cm thick, on rubbing white papery flakes come out from the outer surface, inner surface light brown, fracture fibrous, taste mucilaginous without any characteristic odour.

Roots: The roots of F.racemosa are long, brownish in colour. It's having characteristic odour and in taste Roots are irregular in shape.

Chemistry of the plant Ficus Racemosa

Racemosa Linn species contain flavonoid glycosides , alkaloids , phenolic acids , steroids , saponins , coumarins , tannins , triterpenoids – oleanolic acid rusolic acid , α- hydroxy ursolic acid , protocatechuic acid , maslinic acid . The nonenzymatic constituents include phenolic compounds, flavonoids, vitamin C. The enzymatic constituents present are ascorbate oxidase, ascorbate peroxidise, catalase, peroxidise. The phenolic compounds present are gallic acid and ellagic acid.

Medicinal Applications of the plant Ficusracemosa

A few of the health benefits derived from figs include-

Prevention of constipation: There are 5 grams of fiber in every three-fig serving. That high concentration of fiber helps promote healthy, regular bowel function and prevents constipation.

Weight loss: The fiber in Ficusracemosa also helps to reduce weight and is often recommended for obese people. However, their high calorie count can also result in weight gain, especially when consumed with milk.

Lower cholesterol: Ficusracemosa contain Pectin, which is a soluble fiber. When fiber moves through the digestive system, it basically mops up excess clumps of cholesterol and carries them to the excretory system to be eliminated from the body.

Prevention of coronary heart disease: Dried figs contain phenol, Omega-3 and Omega-6. These fatty acids reduce the risk of coronary heart disease. Furthermore, the leaves of figs have a significant effect on the level of triglycerides in a person's system.

Prevention of colon cancer: The presence of fiber helps to stimulate the elimination of free radicals and other cancer causing substances, particularly in the colon, since fiber increases the healthy movement of the bowels.

Protection against post-menopausal breast cancer: Fiber content in figs have been known to protect against breast cancer, and after menopause, the hormonal balance in women can often fluctuate. The body's systems are so interconnected that hormones affect the immune system, which is turn affect the ability of antioxidants to fight free radicals.

Good for diabetic patients: The American Diabetes Association recommends figs as a high fiber treat that helps promote functional control of diabetes. Ficusracemosa are rich in Potassium, which helps to regulate the amount of sugar which is absorbed into the body after meals.

Prevention of hypertension: People usually take in sodium in the form of salt, but low potassium and high sodium level may lead to hypertension. Figs are high in potassium and low in sodium, so they are a perfect defence against the appearance and effects of hypertension.

Bronchitis: The natural chemicals in Ficusracemosa leaves make it an ideal component for a tea base. Fig leaf tea has been popularly prescribed for various respiratory conditions like bronchitis, and it is also used as a way to prevent and lessen the symptoms of asthmatic patients.

Venereal Diseases: Figs have been traditionally used in the Indian subcontinent and a few other areas of the world as a calming salve for venereal diseases. Ingestion or topical application both work forrelief from sexually transmitted diseases, although further research needs to be done on the exact range of symptoms and diseases which figs positively effect.

Sexual Dysfunction: For centuries, Ficusracemosa have been recommended as a way to correct sexual dysfunction like sterility, endurance, or erectile dysfunction. It has been a major part of mythology and culture, and most of the time, it is referenced as a powerful fertility or sexual supplement.

Strengthens Bones: Ficus racemosa are rich in calcium, which is one of the most important components in strengthening bones, and reducing the risk of osteoporosis. It is also rich in phosphorus, which encourages bone formation and growth if there is any damage or degradation to bones.

Urinary calcium loss: People that maintain a high-sodium diet may be affected by increased urinary calcium loss. The high potassium content in figs helps to avoid that condition and regulates the content of waste in urine and minimizes the calcium lose, while increasing the amount of uric acid and other harmful toxins which you want to get out of your body.

Prevention of macular degeneration: Vision loss in older people is normally due to macular degeneration. Fruits and figs are particularly good at helping you avoid this very common symptom of aging.

Pharmacological Activities of Ficusracemosa

Antimicrobial activity

Methanolic extracts of Ficusracemosa showed significant activity against four clinical strains of bacteria Staphylococcus aureus, Bacillus subtilis, Proteus vulgaris, and E. coli. The standard drug used was tetracycline (100 mcg/ml).

Analgesic activity

Saponin (SN) isolated from Ficusracemosa flowers exhibited protection from writhing induced by 1.2% v/v acetic acid in Adult Swiss albino mice. SN1 was administered ip at doses of 30, 50, 75 and 100 mg/kg and standard drug used were aspirin, paracetamol and morphine sulphate.

Antibacterial activity

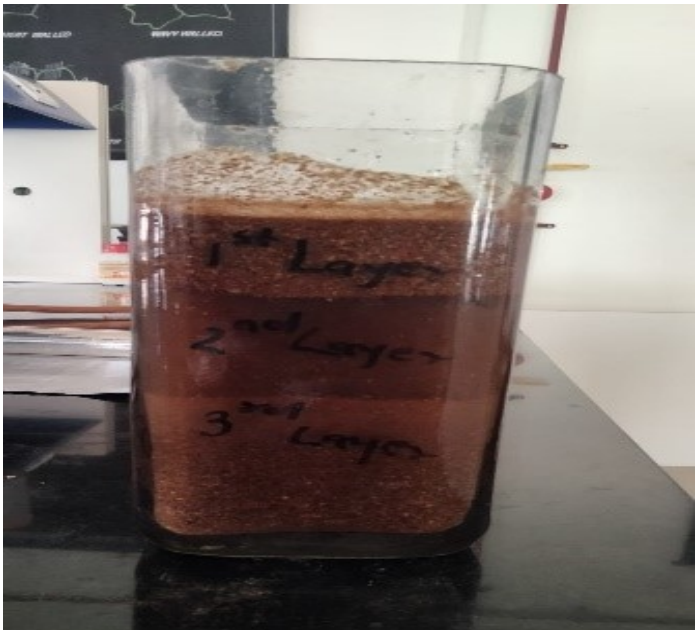
The methanol extract of flowers of the plant have been screened for their antibacterial activity. The extract (7.5 mg/disc) showed broad-

spectrum antibacterial activity against gram positive and gram negative bacteria. The results were compared with the standard drug streptomycin (10 µg/ disc).

Preparation of crude drug extracts

Maceration

In this process, the whole or coarsely powdered crude drug is placed in a stoppered container with the solvent and allowed to stand at room temperature for a period of at least 3 days with frequent agitation until the soluble matter has dissolved. The mixture then is strained, the marc (the damp solid material)is pressed, and the combined liquids are clarified by filtration or decantation after standing.



1 st Layer = Polar aqueous (Heavy layer)
2 nd Layer = Partially soluble extract. (Light crude)
3 rd Layer = Partially insoluble.

Infusion

Fresh infusions are prepared by macerating the crude drug for a short period of time with cold or boiling water. These are dilute solutions of the readily soluble constituents of crude drugs.

Digestion: This is a form of maceration in which gentle heat is used during the process of extraction. It is used when moderately elevated temperature is not objectionable. The solvent efficiency of the menstrum is thereby increased.

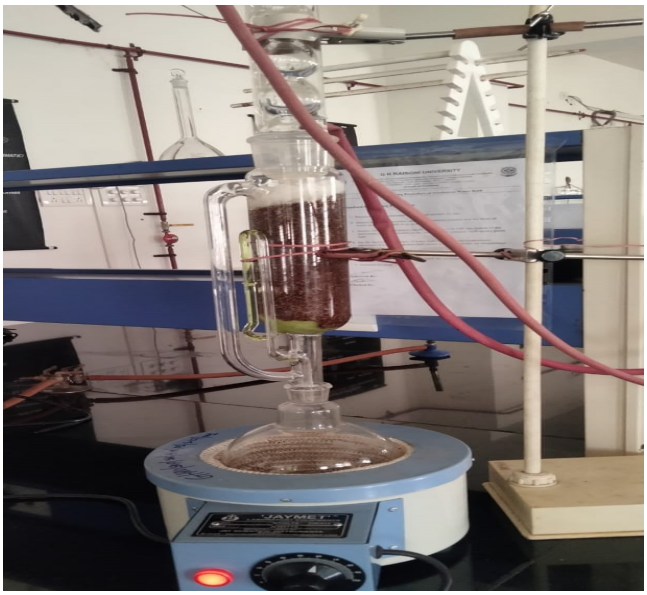
Decoction: In this process, the crude drug is boiled in a specified volume of water for a defined time; it is then cooled and strained or filtered. This procedure is suitable for extracting water-soluble, heatstable constituents. This process is typically used in preparation of Ayurvedic extracts called “quath” or “kawath”. The starting ratio of crude drug to water is fixed, e.g. 1:4 or 1:16; the volume is then brought down to one-fourth its original volume by boiling during the extraction procedure. Then, the concentrated extract is filtered and used as such or processed further.

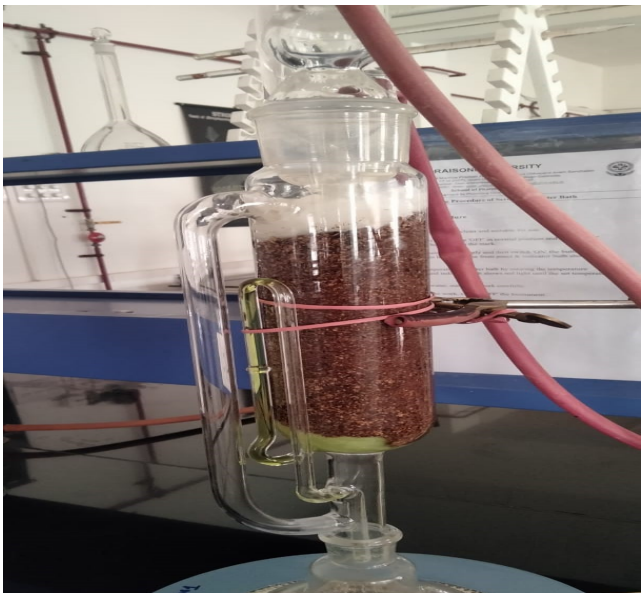
Percolation: This is the procedure used most frequently to extract active ingredients in the preparation of tinctures and fluid extracts. A percolator (a narrow, cone-shaped vessel open at both ends) is generally used. The solid ingredients are moistened with an appropriate amount of the specified menstruum and allowed to stand for approximately 4 h in a well closed container, after which the mass is packed and the top of the percolator is closed. Additional menstruum is added to form a shallow layer above the mass, and the mixture is allowed to macerate in the closed percolator for 24 h. The outlet of the percolator then is opened and the liquid contained therein is allowed to drip slowly. Additional menstruum is added as required, until the percolate measures about three-quarters of the required volume of the finished product. The marc is then pressed and the expressed liquid is added to the percolate. Sufficient menstruum is added to produce the required volume, and the mixed liquid is clarified by filtration or by standing followed by decanting.

Partitioning of Crude Drug Extract

Hot Continuous Extraction (Soxhlet)

In this method, the finely ground crude drug is placed in a porous bag or “thimble” made of strong filter paper, which is placed in chamber E of the Soxhlet apparatus (Figure 2). The extracting solvent in flask A is heated, and its vapors condense in condenser D. The condensed extractant drips into the thimble containing the crude drug, and extracts it by contact. When the level of liquid in chamber E rises to the top of siphon tube C, the liquid contents of chamber E siphon into flask A. This process is continuous and is carried out until a drop of solvent from the siphon tube does not leave residue when evaporated. The advantage of this method, compared to previously described methods, is that large amounts of drug can be extracted with a much smaller quantity of solvent. This effects tremendous economy in terms of time, energy and consequently financial inputs. At small scale, it is employed as a batch process only, but it becomes much more economical and viable when converted into a continuous extraction procedure on medium or large scale.





Conclusion

Tribal and rural societies have discovered solution for their needs, problem and treatment of disease from the natural resources. The Ficus racemosa Lin. having various important pharmacological activity which is discussed in the current review. This is signifies that it is the most vital plant for the human civilization and require more concentration for the formulation development.

REFERENCES

1. Vedavathy S, Mrudula V, Sudhakar A. A Tribal Medicine in Chittoor district, Andhra Pradesh, India. Vedams E Books (P) Ltd. New Delhi, 1997.
2. The Ayurvedic Pharmacopoeia of India, Government of India, Ministry of Health and Family Welfare, Department of Indian System of Medicine and Homeopathy, New Delhi.Ist Edition, Part I, 1990; I: 117-118.
3. Nadkarni KM, revised by Nadkarni AK, Indian Materia Medica, Bombay Popular Prakashan, Mumbai, IInd reprint IIIrd re ed., 2000; 548-550.
4. Khare CP, Indian Medicinal Plants An Illustrated Dictionary, Springer (India) Private Limited, New Delhi, Ist Indian reprint, 2007; 266-267.
5. The Wealth Of India, A Dictionary Of Indian Raw Materials and Industrial Products (Raw Materials) National Institute Of Science Communication, Council of Scientific and Industrial Research, New Delhi, Ist Supp. Set., 2002; III: 130.
6. Kirtikar KR, Basu BD. Indian Medicinal Plants, 1998; III: 2327-2328.
7. Mitra R, Bibliography on Pharmacognosy of Medicinal Plants, National Botanical Research Institute: Lucknow, 1985; 249-250.
8. Ahmed F, Urooj A, Pharmacognostical studies of ficus racemosa stem bark *Pharmacognosy Journal,* 2011; 3(19): 19–24.
9. Deva raj KB, Gowda LR and Prakash V, An unusual thermostable aspartic protease from the latex of Ficus racemosa, phytochemistry, 2008; 69(3): 647- 655.
10. Joseph B, Raj SJ, phytopharmacological properties of ficcus racemosa linn – an overview, *International Journal of Pharmaceutical Sciences Review and Research,* 2010; 3(2): 134-138.
11. Ahmed F, Urooj A. Traditional uses, medicinal properties, and phytopharmacology of Ficus racemosa: A review, Pharmaceutical Biology, 2010; 48(6): 672–681.
12. Joseph B., Raj S. J, Phytopharmacological and phytochemical properties of three Ficus species - an overview, Int J Pharma Bio Sci, 2010; 1: 246-253.
13. Nadkarni AK, Indian Materia Medica, Popular Book Depot: Bombay; 3rd ed, 1954; 2571-2575.
14. Sharma SK, Gupta VK, In vitro antioxidant studies of Ficus racemosa Linn. root. Pharmacognosy Magazine, 2008; 4: 70-74.
15. Prabhakar YS, Suresh KD, A survey of cardioactive drug formulations from Ayurveda II: porridges, oils, clarified butters, electuaries, pastes, ash preparations and calcined powders. Fitoterapia, 1990; 61: 395- 416.
16. Vedavathy S., Rao DN, Herbal folk medicine of Tirumala and Tirupati region of chittoor, District, Anthra Pradesh, Fitoterapia, 1995; 66: 167-171.
17. Sharma SK, Gupta VK, In vitro antioxidant studies of Ficus racemosa Linn. root. Pharmacognosy Magazine, 2008; 4: 70-74.
18. Chopra RN, Chopra IC, Handa KI, Kapur LD, Indigenous Drugs of India, U.N. Dhur and Sons Pvt. Ltd, Calcutta, 1958; 674-675.
19. Murti K, KumarU, Panchal M, Shah M, Exploration of preliminary phytochemical studies of roots of Ficus racemosa, Marmara Pharm J, 2011; 15: 80-83.
20. Vedavathy S, Rao DN, Herbal folk medicine of Tirumala and Tirupati region of chittoor, District, Anthra Pradesh, Fitoterapia, 1995; 66: 167-171.
21. Chandrashekhar CH, Latha KP, Vagdevi HM, Vaidya VP, Anthelmintic activity of the crude extracts of Ficus racemosa, Int J Green Pharm, 2008; 2: 100-103.
22. Nita M, Grzybowski A. The Role of the Reactive Oxygen Species and Oxidative Stress in the Pathomechanism of the Age-Related Ocular Diseases and Other Pathologies of the Anterior and Posterior Eye Segments in Adults. *Oxidative Medicine and Cellular Longevity.* 2016; 2016:1-23. doi:10.1155/2016/3164734.
23. Kurutas EB. The importance of antioxidants which play the role in cellular response against oxidative/nitrosative stress: current state. *Nutr J.* 2016;15(1):71. Published 2016 Jul 25. doi:10.1186/s12937-016-0186-5
24. Salemcity A, Attah A, Oladimeji O, Olajuyin A, Usifo G, Audu T. Comparative study of membranestabilizing activities of kolaviron Dryopteris filix-mas and Ocimumgratissimum extracts. *Egyptian Pharmaceutical Journal*. 2016; 15(1):6. doi:10.4103/1687-4315.184026. 66. Abdulkhaleq LA, Assi MA, Abdullah R, Zamri-Saad M, Taufiq-Yap YH, Hezmee MNM. The crucial roles of inflammatory mediators in inflammation: A review. Vet World. 2018;11(5):627-635. doi:10.14202/vetworld.2018.627-635
25. Kigen G, Kipkore W, Wanjohi B, Haruki B, Kemboi J. Medicinal Plants Used by Traditional Healers in Sangurur, Elgeyo Marakwet County, Kenya. *Pharmacognosy Res.* 2017; 9(4):333-347. doi:10.4103/pr.pr_42_17

26. Patil VC, Choraria K, Desai N, Agrawal S. Clinical profile and outcome of cerebral venous sinus thrombosis at tertiary care center. *J Neurosci Rural Pract.* 2014; 5(3):218-224. doi:10.4103/0976- 3147.133559
27. Sun J, He Z, Nan G. Cerebral venous sinus thrombosis presenting with multifocal intracerebral hemorrhage and subarachnoid hemorrhage: A case report. Medicine (Baltimore). 2018; 97(50):e13476. doi:10.1097/MD.0000000000013476
28. Prasad S, Kashyap RS, Deopujari JY, Purohit HJ, Taori GM, Daginawala HF. Development of an in vitro model to study clot lysis activity of thrombolytic drugs. *Thromb J.* 2006;4:14. Published 2006 Sep 12. doi:10.1186/1477-9560-4-14
29. Gawade SP. Acetic acid induced painful endogenous infliction in writhing test on mice. *J Pharmacol Pharmacother.* 2012;3(4):348. doi:10.4103/0976-500X.103699
30. Munira M, Islam S, Akther N, et al. Estimation of anti-inflammatory, analgesic and thrombolytic activities of Sonneratiacaseolaris Linn. (Family: Sonneratiaceae). *J Anal Pharm Res.* 2019; 8(1):20?23. DOI: 10.15406/ japlr.2019.08.00305 Ms. Sayra Akter Lia B. Pharm. Dissertation work World university of india, Dhaka-1229, Bangladesh Published by Albert Science International Organization (An International Publication House).

******