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Review Article

A REVIEW ON BIOLOGICAL AND PHYTOCHEMICAL PROPERTIES OF FICUS SPECIES

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ABSTRACT

The genus ficus constitutes one of the largest genera of medicinal plants and also an evergreen tree containing more than 800 species occurring in the most tropical and sub tropical areas. ficus trees are native to Indo Australian region, Central and South America and Africa. The present review correlates about various active constituents of ficus species like stigmasterol, quercetin, bergaptene, campesterol, rutin, albumin, malic acid, alkaloids, glycosides, tannins, flavanoids, sterols, coumarins, saponins, phenolic compounds, amino acids, proteins, carbohydrates, lipids. In this study the ficus species have also been analysed for its biological activities like analgesic, anti inflammatory, anti diabetic, anti pyretic, anti oxidant, anti ulcer, anti cancer, free radical scavenging activity, hepato protective, cytotoxicity, anti melanogenic, anti-helminthic, wound healing, anti-microbial, anti-bacterial .
Key words: Ficus, albumin, anti inflammatory, anti oxidant, free radical scavenging activity.

INTRODUCTION

Numerous plants synthesize substances that are useful in the maintenance of health in humans and animals with a view that to increase the wide range of medicinal usages, the present day entails new drugs with more potent and desired activity with less or no side effects. The genus ficus constitutes one of the largest genera of medicinal plants. There are about 511 ficus trees existing in Asia, Malaysia, Pacific island and Australia,132 species occur in central and south America and 112 of ficus occur in Africa ,South of Sahara and Madagascar.[(1)] The word *ficolin*, which appears similar to *Ficus* and refers to a lectin like compound combining the first parts of the words for *fibrinogen* and *collagen*.

GEOGRAPHICAL SOURCE:

Ficus genus occurring in the most tropical and sub tropical areas. ficus trees are native to Indo Australian region, Central and South America and Africa.

VARIOUS SPECIES OF FICUS:

Ficus altissima (council tree), *Ficus aspera* (clown fig), *Ficus auriculata*, syn. *Ficus roxburghii*, *Ficus benghalensis* (Indian banyan), *Ficus benjamina* (weeping fig), *Ficus benjamina* ‘Exotica’, *Ficus*

benjamina 'Comosa', *Ficus binnendykii* (narrow-leaf ficus), *Ficus carica* (common edible fig), *Ficus celebinsis* (willow ficus), *Ficus deltoidea* (mistletoe fig) syn. *Ficus diversifolia*, *Ficus elastica* (Indian rubber tree), *Ficus elastica* Abidjan', *Ficus elastica* 'Asahi', *Ficus elastica* 'Decora', *Ficus elastica* 'Gold', *Ficus elastica* 'Schrijveriana', *Ficus lacor* (pakur tree), *Ficus lingua* (box-leaved fig) syn. *Ficus buxifolia*, *Ficus lyrata* (fiddle-leaf fig), *Ficus macrophylla* (Moreton Bay fig), *Ficus microcarpa* (Chinese banyan), *Ficus microcarpa* var. crass folia (wax ficus), *Ficus microcarpa* 'Variegate', *Ficus pseudo Palma* (Philippine fig), *Ficus pumila* (creeping fig) syn. *Ficus repens*, *Ficus religiosa* (bo tree or sacred fig), *Ficus religiosa* (Port Jackson fig or rusty fig), *Ficus rubiginosa* 'Variegata' Ficus sagittata, *Ficus radicans* (Variegata), *Ficus saussureana*, syn. *Ficus dawei*, *Ficus stricta*, *Ficus subulata*, syn. *Ficus salicifolia*, *Ficus tikoua* (Waipahu fig).

FAMILY:

The ficus tree belongs to the mulberry family of Moraceae. Although it grows in many forms, the most commonly known type of ficus is the benjamina (sometimes called the weeping ficus or weeping fig). This type grows outdoors in bush form in southern Florida, but is grown indoors throughout North America and Europe.

TAXANOMY OF FICUS:

Domain: Eukaryote
Kingdom: Plantae
Subkingdom: Viridaeplantae
Phylum: Tracheophyta
Subphylum: Euphyllophytina
Infraphylum: Radiatopses
Class: Mangoliopsida
Subclass: Dillniidae
Super order: Urticanae
Order: Urticales
Family: Moraceae.

CULTIVATION REUIREMENTS:

PROPAGATION:

Starting new plants is known as propagation, easily multiply the number of ficus plants by a few methods like cutting and seed germination. Cutting is an easy method to propagate ficus. Take about 5 nodes long cutting and prune all leaves and branches off it except a couple of leaves at the top. Dip the base in rooting hormone. Plant this cutting in rich moist soil. Keep the soil moist all the time. fruits of some ficus species have up to 4000 seeds in a single fruit. seeds can also be bought from sellers, but there is nothing like fresh organic seeds. Now plant these seeds in rich moist soil. Add some Peat moss to the soil. Keep the soil moist.

LOCATION:

Ficus trees grow well in just about any well-drained soil. Most ficus tree growers mix peat moss, bark, and sand to use as soil. Most plants can grow in relatively small containers. These plants can adjust to a range of moisture levels, as long as the level is consistent. Many people overwater the tree, making the soil too soggy. The soil should be moist but not soggy, The soil should not dry out between waterings. Ficus grow very well with sub-irrigation and growers shouldn't allow it to dry out between each watering Figs require full sun all day to ripen palatable fruits. Trees become enormous, and will shade out anything growing beneath. Repeated pruning to control size causes loss of crop. The succulent trunk and branches are unusually sensitive to heat and sun damage. Roots are greedy, traveling far beyond the tree canopy. In coastal climates, grow in the warmest location, against a sunny wall or in a heat trap. For container grown plants, replace most of the soil in the tub every three years and keep the sides of the tub shaded to prevent overheating in sunlight.

IRRIGATION:

Young fig trees should be watered regularly until fully established. In dry western climates, water mature trees deeply at least every one or two weeks. Desert gardeners may have to water more frequently. Mulch the soil around the trees to conserve moisture. If a tree is not getting enough water, the leaves will turn yellow and drop. Also, drought-stressed trees will not produce fruit and are more susceptible to nematode damage. Recently planted trees are particularly susceptible to water deficits, often runt out, and die.

FERTILIZATION:

Regular fertilizing of figs is usually necessary only for potted trees or when they are grown on sands. Excess nitrogen encourages rank growth at the expense of fruit production, and the fruit that is produced often ripens improperly, if at all. As a general rule, fertilize fig trees if the branches grew less than a foot the previous year. Apply a total of 1/2 - 1 pound of actual nitrogen, divided into three or four applications beginning in late winter or early spring and ending in July. When grown indoors ficus have almost no need to be fertilized. If you must fertilize any well balanced fertilizer such as 20-20-20 will maintain growth. Pelleted fertilizers also work read instructions carefully. Indoors plants grow slower and therefore have lower requirements for food.

PRUNING:

Fig trees are productive with or without heavy pruning. It is essential only during the initial years. Trees should be trained according to use of fruit, such as a low crown for fresh-market figs. Since the crop is borne on terminals of previous year's wood, once the tree form is established, avoid heavy winter pruning, which causes loss of the following year's crop. It is better to prune immediately after the main crop is harvested, or with late-ripening cultivars, summer prune half the branches and prune the remainder the following summer. If radical pruning is done, whitewash the entire tree.

FROST PROTECTION:

In borderline climates, figs can be grown out of doors if they are given frost protection. Brown Turkey, Brunswick and Blue Celeste cultivars are some of the best choices. Plant against a wall or structure

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which provides some heat by radiation. Or grow as a bush, pruning the trunk to near ground level at the end of the second year. Allow several stems to replace the trunk, and grow as you would a lilac. For further protection, erect a frame over the plant, covering and surrounding it with heavy carpet in winter. Keep the roots as dry as possible during winter, raising a berm to exclude melting snows during thaws. In northern climates, the fig is best grown as a tub or pot plant that can be brought into a warm location in winter and taken out again in spring. Dormant buds are more susceptible to freezing than wood. Freezing may also create a trunk without live buds; regrowth is possible only from roots.

TEMPERATURE:

Ficus enjoy warm conditions between 68-85 daytime temperature, with humidity at a 25 percent minimum. Cold, and drafty conditions in the 40′s and 50′s will slow growth considerably.

LIGHT:

Ficus can survive in low interior light but would prefer bright filtered light Position .Ficus near or opposite a curtained southern window. Ficus has been used by interior plants capers for many years, the plants must be acclimated to their location and drop leaves as they go through the process .

INSECTS AND DISEASES: Mealy bugs, aphids and scale are probably the most common insect indoors. Because of the wide leaves that most Ficus have cleaning the leaves regularly with a damp cloth to remove dust will help not only in appearance but also in removing of some pest which tend to gather under the bottom of leaves .

MEALY BUGS

APHIDES

SCALES

DESCRIPTION

GROWTH HABITAT:

The fig is a picturesque deciduous tree, to 50 ft tall, but more typically to a height of 10 - 30 ft. Their branches are muscular and twisting, spreading wider than they are tall. Fig wood is weak and decays rapidly. The trunk often bears large nodal tumors, where branches have been shed or removed. The twigs are terete and pithy rather than woody. The sap contains copious milky latex that is irritating to human skin. Fig trees often grow as a multiple-branched shrub, especially where subjected to frequent frost damage. They may be espaliered, but only where roots may be restricted, as in containers.

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FOILAGE:

Fig leaves are bright green, single, alternate and large (to 1 ft length). They are more or less deeply lobed with 1 - 5 sinuses, rough hairy on the upper surface and soft hairy on the underside. In summer their foliage lends a beautiful tropical feeling.

FLOWERS:

The tiny flowers of the fig are out of sight, clustered inside the green "fruits", technically a synconium. Pollinating insects gain access to the flowers through opening at the apex of the synconium. In the case of the common fig the flowers are all female and need no pollination. There are 3 other types, the Capri fig which has male and female flowers requiring visits by a tiny wasp, Blastophaga grossorum; the Smyrna fig, needing cross-pollination by Capri figs in order to develop normally; and the San Pedro fig which is intermediate, its first crop independent like the common fig, its second crop dependent on pollination.

FRUITS:

The common fig bears a first crop, called the breba crop, in the spring on last season's growth. The second crop is borne in the fall on the new growth and is known as the main crop. In cold climates the breba crop is often destroyed by spring frosts. The matured "fruit" has a tough peel (pure green, green suffused with brown, brown or purple), often cracking upon ripeness, and exposing the pulp beneath. The interior is a white inner rind containing a seed mass bound with jelly-like flesh. The edible seeds are numerous and generally hollow, unless pollinated. Pollinated seeds provide the characteristic nutty taste of dried figs.

LEAVES:

leaves are 12–25 centimeters (4.7–9.8 in) long and 10–18 centimeters (3.9–7.1 in) across, and deeply lobed with three or five lobes. The complex inflorescence of the common fig consists of a hollow fleshy structure called the syconium .

LATEX:

The ficus produces a liquid-type latex, which is more plentiful in the early morning. This latex is used in tropical America for washing dishes, pans and pots. It used to be used in earlier household commercial detergents for the same purpose; however, its negative affect on the hands of housewives resulted in a discontinuation of it for that use in the United States, according to Purdue University.

COMMERCIAL POTENCIAL:

Because of losses in transport and short shelf life, figs are a high-value fruits of limited demand. The best outlet is direct sale at roadside or farmers markets, but do not permit handling of the fruit. Figs for shipping are collected daily just before they reach the fully ripe stage, but yield to a soft pressure, usually indicated by small cracks in the skin. They should be immediately refrigerated. For commerce,

choose a cultivar that parts readily from the branch and does not tear the neck. Ficus trees have many uses. A Ficus, or fig tree, can be grown and used in the home landscape to provide shade. The ficus, as a deciduous shrub, can work as a hedge, providing privacy by screening in the landscape, or as a food source, by growing edible fig fruit. This fig tree is even used to produce latex for cleaning dishes.

WORK REPORTED ON FICUS SPECIES:

FICUS BENGHALENSIS

Telugu Name: Marri chettu.
English name: The banyan.
Sanskrit Name: Bahupada.
Hindi name: Bar.
Parts used : Barks, flowers.

TRADITIONAL USES:

The milky juice is externally applied for pains and bruises and as an anodyne in rheumatism and lumbago. It is also used as a remedy for toothache[(2)].It helps in wound healing and suppresses inflammation. It acts as a good pain reliever. It also improves vision of eyes. It helps in easy absorption and purifies blood. It produces anti tumor activity. It is used in the treatment of diarrhea, piles. Various extracts were screened for its anti allergic activity in asthma. It is acrid, sweet, astringent, alternative, tonic, maturant, stypic, cooling and used in erysipelas, vomiting, biliousness, vaginal complaints, ulcers leprosy, piles, disease to nose, gonorrhea, syphilis, dysentery, bruises, atrophy, cholera, scabies.[(3)]

PHYTO CONSTITUENTS REPORTED:

ß-sitosterol, a-D-glucose and meso- inositol were reported from the stem bark. The leaves are isolated for petunidin di-glycoside and quercentin 3-galactoside**.** **[(4)]** The fruits are reported for cyaniding, rhamnoglycoside and polysaccharides. Bengalenosides that is, glycosides or flavonoids, ketones, flavonols, pentacyclictriterpenes and triterpenoids, coumarin, sterols, tiglic acid esters, alpha-D-glucose, catechin and genistin and meso-inositol were reported from the plant**.** **[(5)]**.It offered teraxasteroltiglate, rutin, methyl ethers ofleucanthocyanins,2-tetra-triaconten-2-one-sitosterol,friedelin**[(6)].**

BIOLOGICAL ACTIVITIES REPORTED:

The bark of ficus benghalensis has a significant effect in **Inflammatory bowel disease** in rats. The results indicated that the methanolic extract of ficus benghalensis produces protective effect in inflammatory bowel disease due to the presence of flavanoids, terpenoids, phenolic compounds.**[(7)]**The bark has shown the hypoglycemic activity and diabetic activity .The anti diabetic properties of ficus benghalensis has been concluded due to the presence of phytoconstituents like bengalenoside, glycoside of pelargonodin, leucocyanidin ,leucopelargonin**.** **[(8)]**The **anti atherogenic and antioxidant activities** have been reported from the bark of ficus bengalensis due to the presence of flavanoids**[(9)]** The hydro alcoholic extract from bark of ficus bengalensis was proved effective against *Actinomyces viscous* (MTCC 7345) and the minimum inhibitory concentration (MIC) was determined to be 0.08mg/ml. **[(10)]** The immuno modulatory effect of methanol extract was found to stimulate cell mediated and antibody mediated immune responses in rats. It also enhanced the phagocytic function of the human neutrophiles, *in vitro.* The aqueous bark of F.benghalensis exhibited significant antibacterial activity against pathogenic bacterial like Staphylococcus aureus, Pseudomonas aeruginosa and Klebsiella premoniae [(11)]

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FICUS GLOMERATA

Telugu Name: Athi**.**
Hindi Name: Gular, Umar.
Marati Name: Athi.
English Name: Cluster fig.
Parts used : Stembark, fruit and latex.

TRADITIONAL USES:

It is used as astringent, cooling, acrid, galactogogue, aphrodisiac, cooling carminative, expectorant. It is also used in burning sensations, fatigue, urinary discharge, leprosy, piles ,non-bleeding, intestinal worms, chronic bronchitis, diseases of kidney and spleen, inflammation, stomachic, diarrhoea, dysentery smallpox, cancer, diabetes, urinary diseases, gonorrhea, toothache, backache.**(12).**

PHYTO CONSTITUENTS REPORTED:

It was reported for alkaloids glycosides like friedelin, lupeol, tetra cyclic triterpene-glucanol acetate, leucanthocyanins, amyrin acetate, flavanoids , amino acids.**(13)** The leaves of plant were characterized for glauanol acetate ,tetratriterpene. The fruit was isolated for glucose, tigilic acid, sitosterol, hentriacontane, lupeolacetate and other phytosterol. Amyrin cycloeuphordenol, cycloartenol and its esters euphol, euphorbenol, isoeuphorbenol, palmiticacid,taraxerol, trimethyl ellagic acid have been reported from latex.(13)

BIOLOGICAL ACTIVITIES REPORTED:

The fruits, barks and leaves of methanolic extract of ficus glomerate have been reported for **anti microbial activity**, **free radical scavenging activity** and **anti oxidant activity.** The anti microbial studies were carried out by using methanolic plant extract against four micro organisms namely Bacillus substilies, Pseudomonas aeruiginosa, salmonella typhi, Staphylococcus aerius **and** the fruit extracts showed moderate efficacy compared to antibiotic clarithromycin.(14)The leaves showed highest activity against p. aeruginosa. Free radical scavenging activity has been concluded by using DPPH method and the absorbance was absorved as 0.980±0.02 at 557nm. **(15)** The total anti oxidant activity of the extracts was determined through phosphor molybdate assay**(16)**

FICUS RELIGIOSA

Telugu: Ravichettu **.**
English: The peepal.
Hindi : Peepal, pipul.
Sanskrit : Ashvatha.
Guajarati : Piplo, Jari, Piparo, Pipalo .
Kashmiri: Bad
Tamil : Ashwarthan, Arasamaram, Arasan, Arasu, Arara.
Parts used : Bark, leaves.

TRADITIONAL USES:

It is bitter, sweet, acrid, used as anti-bacterial, refrigerant, alternative, astringent, aphrodisiac, purgative, laxative, glandular swellings of neck. Root bark is good for stomatitis. It is astringent in leucorrhoea. Roots are said to be good for gout. The fruit is laxative, promotes digestion, aphrodisiac and checks vomiting. The seeds are cooling, laxative. The leaves alone are used to treat constipation. The leaves

and young shoots together are purgative (strong laxative). It is used in the treatment of diseases of blood,vagina, uterus, burning sensation, thirst, biliousness, diseases of heart, ulcers, urinary discharge, inflammation, scabies, asthma, obstinate hiccup, cracked foot, fistula, toothache, snake venom, skin disease, atrophy, cachexia, fever cholera, otitis, pimples, sores.[17].

PHYTO CONSTITUENTS REPORTED

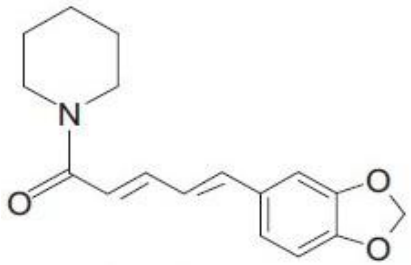
The stem bark of *F. religiosa* were reported for the constituents like phenols, tannins, steroids, alkaloids and flavonoids, β-sitosteryl-d-glucoside, vitamin K, n-octacosanol, methyl oleanolate, lanosterol, stigma sterol, lupen-3-one. The active constituent β-sitosteryl-d-glucoside, were reported from the root bark of *F. religiosa*. The fruits of *F. religiosa* were reported for 4.9% protein (isoleucine and phenylalanine), flavonols namely kaempeferol, quercetin, and myricetin. The seeds contain phytosterolin, β-sitosterol, and its glycoside, albuminoids, carbohydrate, fatty matter, coloring matter, caoutchoue 0.7-5.1%[18]. Leaves and fruits were reported for carbohydrate, protein, lipid, calcium, sodium, potassium, and phosphorus. The aqueous extract of dried bark of *F. religiosa* has been reported to contain phytosterols, flavonoids, tannins, furanocoumarin derivatives namely bergapten and begaptol.[19]

The fruit of *F. religiosa* contained appreciable amounts of total phenolic contents, total flavonoid, and percent inhibition of linoleic acid.

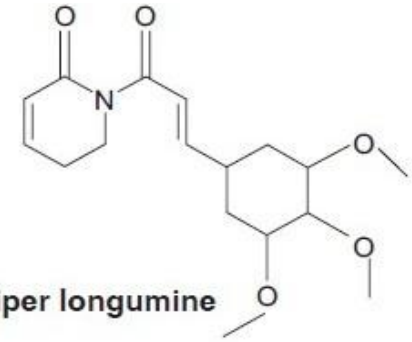
BIOLOGICAL ACTIVITIES REPORTED:

The isolated β-sitosteryl-d-glucoside from the root bark of *F. religiosa* was showed a per oral hypoglycemic effect in fasting and alloxan-diabetic rabbits and in pituitary-diabetic rats. The bark of F. religiosa possesses significant anti-ulcer activity in animal models. It has a gastric anti secretory and acid neutralizing effect that are comparable to the drug ranitidine. A significant ($P<0.05$) reduction in ulcer index of all assays like Indomethacin induced gastric ulcers, cold resistant stress induced ulcers, pylorus ligation induced ulcers in rats were reported [20].

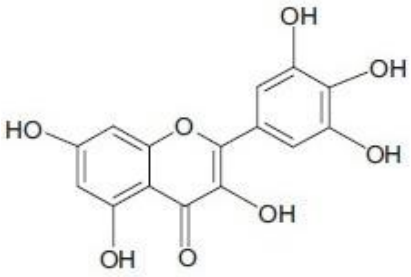
F. religosa produced, a pronounced reduction in blood glucose levels of normal, glucose-loaded hyperglycemic and streptozocin (STZ) induced diabetic rat and effect was compared with glybenclamide an anti diabetic drug.[20]. The leaves of f. religosa exhibited an anti inflammatory activity. stem bark of methanolic extract of F. religosa reported for the analgesic activity against acetic acid-induced mice at the doses of 250 mg/kg and 500 mg/kg and also the methanolic extracts of F. religiosa reported for anti helminthes activity [21] *F. religiosa* had anticonvulsant activity against maximum electroshock (MES) and picrotoxin-induced convulsions, with no neurotoxic effect, in a dose-dependent manner. There was a significant decrease in the duration of tonic hind limb extension at all the three doses of extract (25, 50, and 100mg/kg) in MES model with maximum protection at 100mg/kg dose, as compared to control group. [22]Wound healing activity of the hydro alcoholic extract of Ficus religiosa leaves were studied in rats. [23]



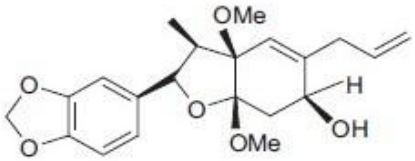
Piperine



Piper longumine



Myricetin



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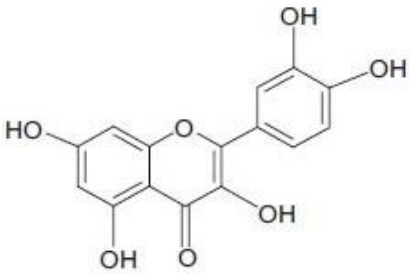
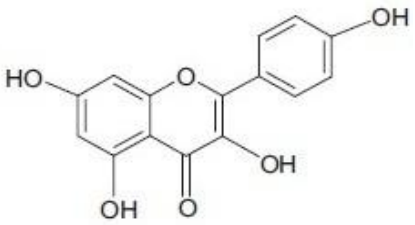
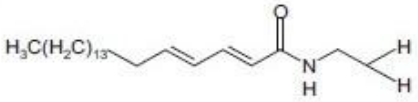


Methyl piperate



Kaemferol



N-Isobutyl-ecosa-trans-4-dienamide

FICUS CARICA
English: *common fig tree*.
Hindi : *anger*.
Sanskrit: *angira*.
Telugu : *anjuru*,

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TRADITIONAL USES:

A decoction of the leaves are used as a stomachic. The leaves are also added to boiling water and used as a steam bath for painful or swollen piles. The latex from the stems is used to treat corns, warts and piles. The fruit is mildly laxative, demulcent, digestive and pectoral. The unripe green fruits are cooked with other foods as a galactogogue and tonic. The roasted fruit is emollient and used as a poultice in the treatment of gumboils, dental abscesses . Syrup of figs, made from the fruit, is a laxative used for the young and very old. The plant has anticancer properties. The juice of the fruit with honey was prescribed for checking hemorrhage. (Vrindamaadhava). Angir (dry fruit) is a good nutritional supported for diabetics. Roots are used as tonic, leucoderma and ringworm infection. Latex is used as expectorant, diuretic, anti helmintic. Leaves are used as ant diabetic, vermifuge, contact dermatitis in human, photo toxicity in animals. roots are used in treatment of leucoderma and ringworms and its fruits which are sweet, have antipyretic, purgative, aphrodisiac properties and have shown to be useful in inflammations and paralysis [24].

PHYTOCONSTITUENTS REPORTED:

Campesterol, hentriacontanol, stigma sterol, euphorbol and its hexacosanate, ingenol and taraxerone were isolated from the stem bark of ficus carica. Leaves, Latex and Dried seeds were reported for moisture(67.6%) protein(4.3%),fat(1.7%),crude fiber(4.7%) ash (5.3%) N-free extract, (16.4%),pentosans(3.6%), carotene , bergaptene, stigmasterol, sitosterol, and tyrosine. Ficusin, taraxasterol, betasitosterol, rutin, sapogenin, Calotropenyl acetate, lapel acetate and lanolin, caoutchouc (2.4%), resin, albumin, cerin, sugar and malic acid, rennin, proteolytic enzymes, diastase, esterase, lipase, catalase, and peroxidase. 30% of a fixed oil (oleic, 18.99%; linoleic, 33.72%; linolenic, 32.95%; palmitic, 5.23%; stearic, 2.1 8%; arachidic, 1.05%) and is an edible oil [25].

BIOLOGICAL ACTIVITIES REPORTED:

The Methanolic, hexanoic, chloroformic and ethyl acetate extracts of *Ficus carica* latex were investigated for their in vitro antimicrobial proprieties against bacteria and fungi. The petroleum ether extract exerted a **hepato protective activity** and the biochemical, histological and functional changes were observed in rifampicin treated rats,[26]. The anti-angiogenic and anti-proliferative potentials of *Ficus carica* latex extract was reported using human umbilical vein endothelial cells (HUVECs). The results indicated that latex extract could be used for the prevention of angiogenesis in cancer and other chronic disorders.[27] The ethanolic extract of F. carica leaves were reported **anti pyretic action** in albino rats and showed dose dependent reduction in normal body temperature and yeast-provoked elevated temperature. The anti-pyretic effect was compared to that of Paracetamol a standard anti-pyretic agent [28]. The immunomodulatory effect of ethanolic extract of *F. carica leaves* were reported in mice by hematological and serological tests. Administration of extract remarkably ameliorated both cellular and humoral antibody response [28] The fruit of the plant indicated spasmolytic effect by using rabbit jejunum preparations through K+ATP channel activation. Ficin (mixture of proteases) present in latex of *Ficus carica* Linn. was reported for haemostatic effect by shortening the activated partial thromboplastin time and the prothrombin time. The chloroform extract obtained from a decoction of *Ficus carica* leaves improved the blood cholesterol status in streptozocin induced diabetic rats[29]. The methanolic and aqueous extract of F.carica were reported for anti-helminthic activity against Earthworms resemblance with the parasites of human beings [29].

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FICUS RACEMOSA
Telugu : Arri,Athi.
Sanskrit:Udumbara,Krimiphala.
English:clusterfig
Part Used : Bark, Root, Latex, Fruit .

TRADITIONAL USES:
roots are used in hydrophobia whereas bark is acrid, cooling, galactagogue and good for gynecological disorders. Fruits are astringent to bowels, styptic, tonic and used in the treatment of leucorrhoea, blood disorders, burning sensation, fatigue, urinary discharges, leprosy, menorrhagia, epistaxis and intestinal worms. According to unani system of medicine, leaves are astringent to bowels and good in case of bronchitis whereas fruits are useful in treatment of dry cough, loss of voice, diseases of kidney and spleen. Bark is useful in asthma and piles. Latex is applied externally on chronic infected wounds and to promote the healing. The tender leaf buds are applied on the skin, in the form of paste, to improve the complexion. Roots are used in dysentery, pectoral complaints, diabetes, applied in mumps, other inflammatory glandular enlargements. roots are useful in hydrophobia .

PHYTOCONSTITUENTSREPORTED:
The leaf of the plant is reported for sterols, triterpenoids (Lanosterol) and alkaloids, tannins and falconoid. Stem-bark offered gluanolacetate,β-sitosterol,leucocyanidin3-OβDglucopyrancoside,leucopelargonidin,leucopelargonidin3OαLrhamnopyranoside, lupeol ceryl behenate, lupeol acetate and α-amyrin acetate . From trunk bark, lupenol, β-sistosterol and stigmasterol were isolated. Fruits were identified for gluanol acetate, glucose, tiglic acid esters of taraxasterol, lupeol acetate, friedelin higher hydrocarbons (Hentriacontane) and other phytosterols. A new tetra cyclic triterpene glauanol acetate was isolated from the leaves. An unusual thermos table aspartic protease was isolated from latex of the plant. The stem bark and fruit showed presence of gluanol acetate.[30]

BIOLOGICAL ACTIVITIES REPORTED:
The ethanol extract of bark and leaves are reported for analgesic activity [30] . This plant showed hypolipidimic effect by the fecal excretion of bile acids and cholesterol.[31] The ethanolic extract lowered glucose level in alloxan induced albino rats conforming its hypoglycemic activity.[32]. Ethanolic extract of plant showed an anti diarrheal action in castor oil induced diarrhea[33] The methanol extract of stem bark was tested for its anti tussive potential against a cough induced by sulphur dioxide gas in mice..(Bhaskara et al 2003) Ethanol extract of stem bark showed wound healing in excised and incised wound model in rats[34] The decoction of the bark of *F. racemosa* was claimed as an ant diuretic in rats[35] An ethanolic extract of the leaves was evaluated for hepato protective activity in rats by subcutaneous injection of 50% v/v carbon tetrachloride The biochemical parameters SGOT, SGPT, serum bilirubin and alkaline phosphates were estimated to assess the liver function.[36]. Atho cyanides of fruits of F.recemosa demonstrated vaso-protective effect in rabbits. Ethnomedicinal study and antibacterial activities of F. recemosa were reported[37] A clinical trail was taken on 15 species of burn with a composite ointment of which F.racemosa was one of the constituents. It is proved highly efficacious in controlling *Candida Albican* infections and held in quicker epitheliazation. The burns were completely healed in 8-26 days of treatment[38].

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FICUS MICROCARPA

Parts used: Leaves**.**

TRADITIONAL USES :

The leaves are used for medicinal skin disease, appendicitis, abscesses, poisonous snakebites and shortness of breath. The root is used for neutralizing toxins (fish), prevention of asthma, also the leaves can cause vomiting. The sap is used to overcome the swelling and headache. Fruit are used for laxatives. It is useful in conditions such as diabetes, ulcers, burning sensations, hemorrhages, leprosy, itching, liver disease and toothache[39] The cytotoxic [40] antifungal [41]and hypoglycemic effect [42]of *Ficus microcarpa* Leaves has been reported.

PHYTOCONSTITUENTS REPORTED:

The phytoconstituents reported from the plant are (2S,3S, 4R) -2-[(2'R) -2' - hydroxyl pentracosanoylamino]-heptadecane -1, 3, 4-triol, 12, 20 (30) -ursa-dien-3alpha-ol,epifriedelanol, alpha-amyrin acetate, beta-sitosterol, beta daucosterol, hexacosanoic acid, heneicosanoic acid,[43]ficus carpanoside A, guaiacylglycerol 9-*O*-β-Dglucopyranoside,erythro-guaiacylglycerol 9-*O*-β-Dglucopyranoside,guaiacylglycerol, erythro-guaiacylglycerol,4-methoxy guaiacylglycerol 7-*O*-β-D-glucopyranoside, and 3-(4-hydroxy-3-methoxy phenyl) propan-1,2-diol[44]ficus carpanoside B, (7*E*,9*Z*)-dihydrophaseic acid 3-*O*-β-dglucopyranoside,ficuscarpanic acid, 2,2'-dihydroxyl ether, [(7*S*,8*R*)-syringoylglycerol, (7*S*,8*R*)-syringoylglycerol-7-*O*-β-d-glucopyranoside and icariside D2 [45]are isolated from the aerial roots

I.

II. BIOLOGICAL ACTIVITIES REPORTED:

The ethanolic extract of *F. microcarpa* L. leaves (EEFML) was evaluated for its hypoglycemic activity against alloxan-induced diabetes .The extract significantly ($p<0.001$) reduced the amount of blood glucose levels **.** Ethanolic extract of F.microcarpa was reported for **hypo lipoproteinemic activity**. Results suggested that the extract was increased HDL concentration and lowered triglycerides, total cholesterol, LDL and VLDL against diabetic control. **[46]** The methanol extracts prepared from bark, fruits and leaves of F. microcarpa exhibited strong antioxidant activity assayed by different methods like DPPH and ABTS_+ free radicals scavenging, PMS–NADH system superoxide radical scavenging and b-carotene–linoleic acid system. Antibacterial activities of extracts were tested against Bacillus substilis, Bacillus cereus, Bacillus braves, Achromobacter polymorph, Mycobacterium avium and Escherichia coli by using a disc diffusion method.[47]

FICUS DELTOIDEA

English: Rusty-leaved bush fig.

Parts used: whole plant.

TRADITIONAL USES:

Traditionally used as a postpartum depression treatment to help in contracting the muscles of the uterus and in the healing of the uterus and vaginal canal, it is also used as a libido booster by both men and women . The leaves of plants are mixed in specific proportions to be taken as an aphrodisiac. This plant has been used for regulating blood pressure, increasing and recovering sexual desire, womb contraction after delivery, reducing cholesterol, reducing blood sugar level, treatment of migraines, toxin removal, delay menopause, nausea, joints pains, piles pain and improving blood circulation. The plant products

are formulated and sold in the form of extracts, herbal drinks, coffee drinks, capsules, and massage oil.[48]

PHYTO CONSTITUENTS REPORTED:

Ficus deltoidea was reported for polyphenols, flavenoids, tannins, tri terpenols, aminoacids, saponins, alkaloids anthraquinons, coumarins , sterols and proanthocyanins. [49]

BIOLOGICAL ACTIVITIES REPORTED:

Ficus deltoidea, methanolic extracts exhibited anti-inflammatory activity using free radical scavenging activity, reducing power of iron, superoxide anion scavenging and lipid per oxidation. [50] The aqueous extract of Ficus deltoidea whole plant was investigated to evaluate the rate of wound healing activity and accelerated the rate of wound healing compared to wounds treated with sterile deionizer water [51]. Cytotoxicity of the extract was measured using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. F. deltoidea extract has strong anti-melanogenic activity that is exerted by direct inhibition of tyrosinase enzyme activity and by down-regulation of the expression of genes involved in the melanogenesis pathways.[52]. The aqueous extract of Ficus deltoid stimulated insulin secretion significantly and the magnitude of stimulation was 7.31-fold ($P < 0.001$).The insulin secretary actions of the hot aqueous extract involved K(+)(ATP) channel-dependent and K(+)(ATP)-channel-independent pathway. The extract also has the ability to induce the usage of intracellular Ca(2+) to trigger insulin release.[53]

FICUS BENJAMINA

English - Golden fig, Java fig.
Hindi - Pukar.
Parts used: Leaves.

TRADITIONAL USES:

It is astringent to bowels; useful in treatment of biliousness, ulcers, erysipelas, vomiting, vaginal complains, fever, inflammations, leprosy. its latex is aphrodisiac, tonic, vulnerary, maturant, lessens inflammations; useful in piles, nose-diseases, gonorrhea etc. The aerial root is styptic, useful in syphilis, biliousness, dysentery, inflammation of liver etc. Leaves, bark and fruits are use as antimicrobial, antibacterial, antitumor, anti-inflammatory, antinocieptive, antipyretic, cytotoxic activity. [54] It is traditionally used as a stomachic, hypotensive and anti-dysentery agent [55]. Twigs are used as insect repellant by keeping them under the beds [56].Leaf juice is used as flea and bug repellant [57]. Latex is applied on boils

PHYTO CONSTITUENTS REPORTED:

The plant was reported for alkaloids , triterpenes [58], ascorbic acid. [59] and flavonoids [60]. cinnamic acid, lactose, naringenin, quercetin, caffeic acid and stigmasterol

BIOLOGICAL ACTIVITIES REPORTED:

The leaves of *Ficus benjamina* ethanolic extracts were evaluated for in vitro antioxidant activity using nitric oxide and DPPH free radicals. plant extracts exhibited scavenging effects against free radicals using CCl4 induced hepatotoxicity model in Wistar albino rats. [61]

FICUS INDICA

English : Indian fig opuntia, barberry fig, and prickly pear.

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Parts Used: Fruit, pads and fruit juice .

TRADITIONAL USES:

Ficus indica is used to cure hangover cure ,DNA damage. The extract has become a potential source of raw material for pharmaceutical and functional food industries. An extract of the F.indica has a moderate effect on reducing hangover symptoms, by inhibiting the production of inflammatory mediators. Pectin and water-soluble fiber from F. indica are effective in treating problems associated with diabetes and obesity, including the regulation of blood sugar and low-density lipoprotein (LDL) metabolism It is also having antioxidant, anti-inflammatory and immunomodulatory .

PHYTO CONSTITUENTS REPORTED

The plant was reported for flavonoids, such as quercetin, kaempferol, and isorhamnetin betalains, carotenoids, and polyphenols calcium, magnesium, essential amino acids, pectin and water-soluble fiber[(62)] **.** From the stems and fruits of *F.indica* kaempferol 3-methyl ether, quercetin 3-methyl ether, narcissin, (+)-dihydrokaempferol (aromadendrin),(+)-dihydroquercetin (taxifolin), eriodictyol, and two terpenoids, (6S,9S)-3-oxo-α-ionol-|β-D-glucopyranoside and corchoionoside were reported[(63)]

BIOLOGICAL ACTIVITIES REPORTED:

Ficus indica was reported for the treatment of gastric ulcer in ethanol-induced ulcer of rat. The ultra structural changes were observed by transmission electronic microscopy (TEM) confirming the protective effect exercised by administration of plant extract. **T**he cladodes of F.indica were reported for lipid metabolism in hypercholesterolemic rats. significant reductions in cholesterol, LDL and triglyceride plasma levels were found. F.indica cladode, fruit and flower infusions were significantly increased diuresis showed a modest but not significant increase in natriuresis and kaliuresis. F. indica Opuntia ficus indica was reported on lipid metabolism in hypercholesterolemic rats due to the he high fiber content of the cladodes [(64)] Methanol extract of stems of *Opuntia ficus-indica* were evaluated for their anti-inflammatory action using adjuvant-induced pouch granule model in mice and β-sitosterol was identified as an active anti-inflammatory compound. [(65)] The cladodes of *F.indica* were reported for the treatment of gastric ulcer against ethanol-induced ulcer in rat and ultra structural changes were observed by TEM, confirming the protective effect [(66)] The suppression of ovarian tumor growth by aqueous extracts of fruits of F.indica was studied in mice, and compared with that of the chemo preventive agent N-(4-hydroxyphenyl) retinamide (4-HPR) [(67).] Opuntia ficus-indica extracts were reported in alleviating the excitotoxic neuronal damage induced by global ischemia. [(68)] Methanolic extracts of F.indica dose-dependently inhibited lipid oxidation induced by organic hydro peroxide in isolated human red blood cells [(69).] The methanol extract of F.indica also produced dose-dependent neuroprotective effects on hydroxyl- and superoxide radical-mediated neuronal damage in mouse [(70).]

FICUS RETUSA

Telugu : Yerra juvvi

TRADITIONAL USES:

Ficus retusa has been used as aphrodisiac, antihypertensive, anticancer, antioxidant, hepato protective, gastro protective, ant diabetic, anthelmintic, ant malarial, anti inflammatory, analgesic and antimicrobial [(71)] Root barks and leaves are used in wounds and bruises. Dried roots are mixed with salt are applied to decaying or aching tooth. Roots are used in the treatment of liver diseases. [(72)] The golden yellow leaves of F.retusa

PHYTO CONSTITUENTS REPORTED:
polyphenolic compounds named retusa phenol [2-hydroxy-4-methoxy-1,3-phenylene-bis- (4-hydroxy-benzoate) , (+)-retusa afzelechin , luteolin, (+)afzelechin, (+) - catechin ,vitexin , -sitosterol acetate, _-amyrin acetate, moretenone, friedelenol, amyrin and _-sitosterol were isolated from the ethanolic extract of the aerial parts of *Ficus retusa* .The golden yellow leaves of F.retusa were reported for flavanoida.triterpenoids ,carotenoids, steroids, coumarins,flavanes 4-hydroxy benzoate and isoflavones.(73)

BIOLOGICAL ACTIVITIES REPOTED: The ethyl acetate extract of F.retusa was reported for anti inflammatory activity and showed significant reduction of carrageen an induced edema in rats. Ethyl acetate and methanolic extracts of F.retusa were identified for hepato protective activity against carbon tetra chloride induced hepato toxicity in rats.(74)

FICUS SEPTICA
Telugu – Kondaravi.
Hindi - Doomar
Parts used -
TRADITIONAL USES:

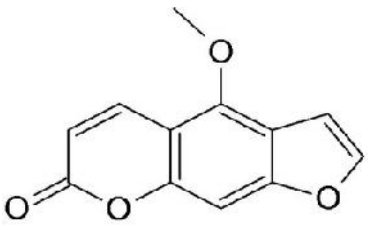
A decoction is made from the roots of this fig tree which is used as a diuretic, while the roots are boiled or heated and used as a poultice for boils and other skin eruptions. The fresh leaves are used to promote sweating during fevers, and are also used to get rid of headaches. The leaves are used for medicinal skin disease, appendicitis, abscesses, poisonous snakebites and shortness of breath. The root is used for neutralizing toxins (fish), prevention of asthma, also the leaves can cause vomiting. The sap is used to overcome the swelling and headache. Fruit are used as laxatives.

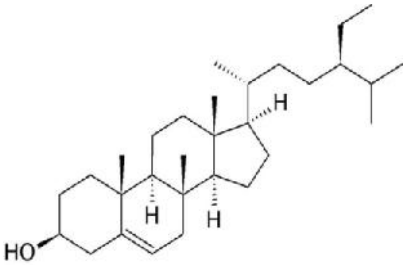
PHYTO CONSTITUENTS REPORTED:

This plant was reported for alkaloids, which include (-)-tilosrebrin (hauptalkaloid), tiloforin, septisin, and antofin, but it also contains flavonoida. Two new aminocaprophenone alkaloids, ficuseptamines A and B and a new pyrrolidine alkaloid, ficuseptamine C , together with 12 known alkaloids and a known acetophenone derivative were isolated from a methanolic extract of the leaves of Ficus septica.(75)

BIOLOGICAL ACTIVITIES REPORTED:
n-hexane insoluble fraction of *Ficus septica* leaves was evaluated which is potential to be developed as chemotherapeutic agent for breast cancer by inducing apaptosis and cell cycle arrest(76)

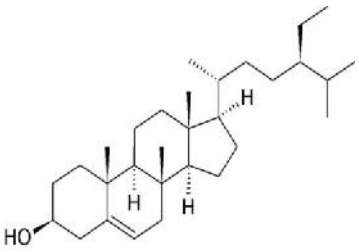
Some of the Chemical constituents reported from ficus species:

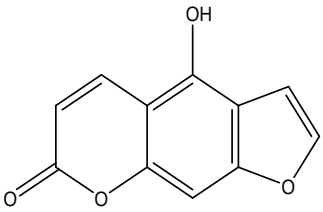




Bergaptol

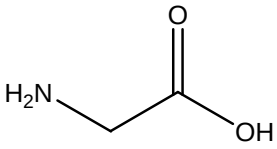
Lanosterol



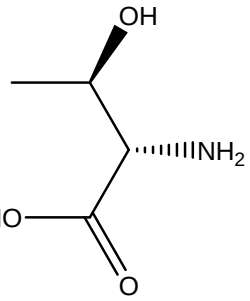


Sitosterol

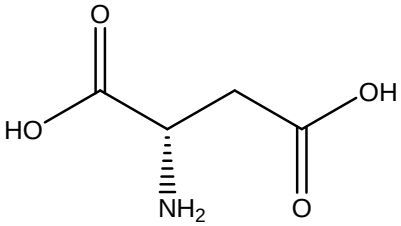
Bergapton



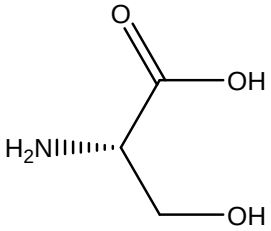
glycine



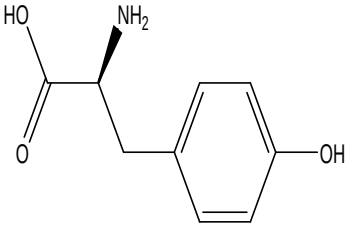
threonine



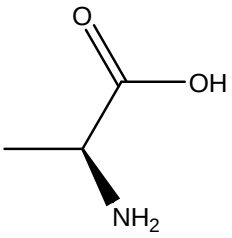
asparticacid



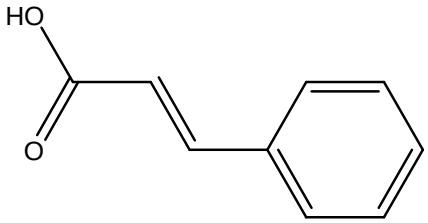
serine



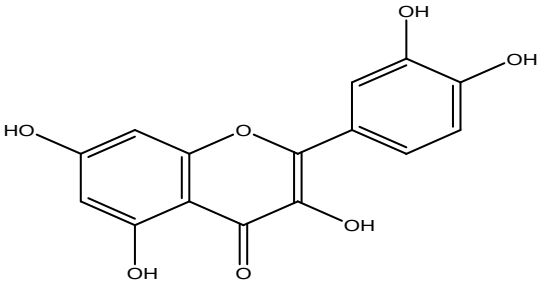
tyrosine



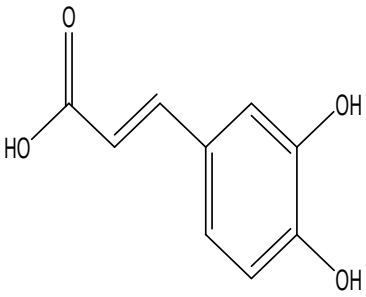
alanine



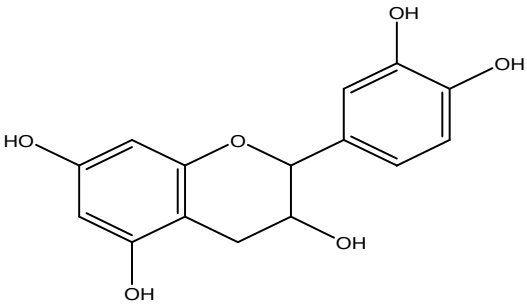
cinnamic acid



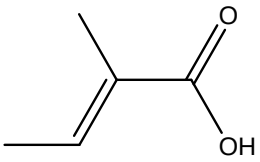
Quercetin



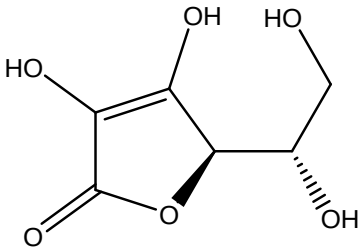
caffeic acid



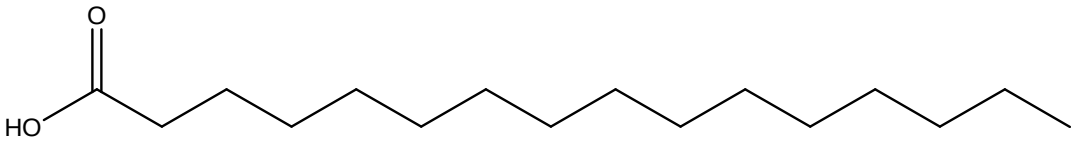
catechin



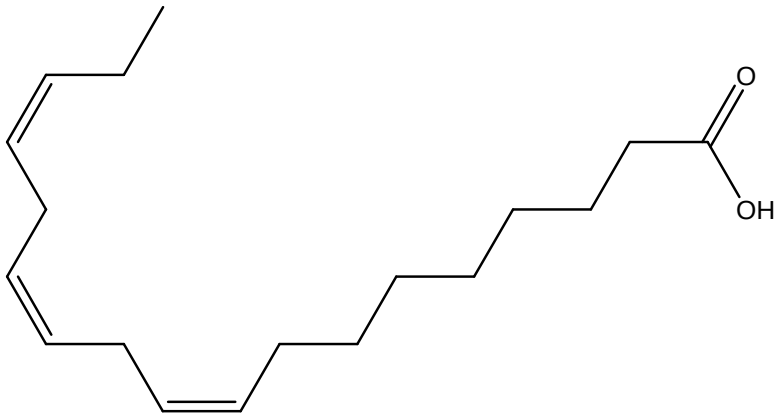
tiglic acid



ascorbic acid



Palmiticacid



Linolenicacid

CONCLUSION:

India has an ancient heritage of traditional medicine. In this connection the search was done on the ficus genus.The species are found through out the india either wild or cultivated. These (F. Racemosa, F.benghalensis, F. Religiosa, F. Carica.) are popular in the in the indegeneous system of medicine like Ayurveda, siddha, unani, and Homeopathy. In the traditional system of medicine various plant parts such as bark, root, leaves, fruits, and latex are used in dysentery, diurea, diabetes, mennorhage, Haemoptysis etc.

The genus ficus species have been analysed for their active constituents like benghalenosode, stigmasterol, quercetin, bergaptene, campesterol, rutin, albumin, malic acid, alkaloids, glycosides, tannins, flavanoids, sterols, coumarins, saponins, phenolic compounds, amino acids, proteins, carbohydrates, lipids, fixed oils, sodium, calcium, magnesium, phosphorous,ash and crude fibers .Biological activities isolated from ficus species are analgesic, anti inflammatory, anti diabetic, anti pyretic, anti oxidant, anti ulcer, anti cancer, free radical scavenging activity, hepato protective, cytotoxicity, anti melanogenic,anti-helminthic, wound healing, anti-microbial, anti-bacterial and anti-convulsing.

Every part of ficus plant includes leaves, roots, twigs, barks, fruits have their own medicinal uses. Different species of ficus has close characteristics in terms of their chemical constituents and physical features and the beneficial of itself.

Plant medicines are the most widely used medicines in the world today. A full 85% of the worlds population employs herbs as their primary medicines and while drug store shelves in the US are stocked mostly with the synthetic remedies in other parts of the world the situation is quite different. In Germany, pharmacies dispense herbs prescribed by physicians.

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