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A REVIEW ON *FICUS RELIGIOSA* - AN IMPORTANT MEDICINAL PLANT

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ABSTRACT: *Ficus religiosa* Linn. is a large evergreen tree found throughout India, wild as well as cultivated, it is widely branched tree with leathery, heart-shaped, long tipped leaves. It is a sacred plant in India. It is one of the most versatile plants having a wide variety of medicinal activities, therefore, used in the treatment of several types of diseases, e.g., diarrhea, diabetes, urinary disorders, burns, hemorrhoids, gastrohelcosis, skin diseases, convulsions, tuberculosis, fever, paralysis, oxidative stress, bacterial infections, etc. This is a unique source of various types of compounds having diverse chemical structure (phenolics, sterols etc.). In this article, we will review the knowledge regarding peepal.

Keywords: *Ficus religiosa*, Different species of *Ficus*, Pharmacognosy, Phytochemistry, Pharmacological activities, Medicinal uses

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INTRODUCTION: Medicinal plants are naturally gifted with invaluable bioactive compounds which form the backbone of traditional medicines¹. 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 against particular disease². The use of plants as medicines antedates history¹. Medicinal plants have served through ages, as a constant source of medicaments for the exposure of a variety of diseases, as they have curative properties due to the presence of various complex chemical substances of different composition, which are found as secondary plant metabolites in one or more parts of these plants³.

The history of herbal medicine is almost as old as human civilization^{4, 5}, and traditional medicines from plants have attracted major attention worldwide because of their potential pharmaceutical importance⁶. The material medica 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 systems including Ayurveda, Siddha, Unani, and Homoeopathy⁸. Any part of the plant may contain active components like bark, leaves, flowers, roots, fruits, seeds, etc.⁹ The beneficial medicinal effects of plant materials typically result from the combinations of secondary products present in the plant.

***Ficus*:** It is a genus of about 800 species and 2000 varieties, which are woody trees, shrubs and vines in the family Moraceae occurring in most tropical and subtropical forests worldwide¹⁰. It is collectively known as fig trees, and the most well-

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known species in the genus is the common fig which produces commercial fruit called fig¹¹. *Ficus* is one of the most loved bonsai. It is an excellent tree for beginners, as most species of *Ficus* are fast growers, tolerant of most any soil and light conditions. About half of the species of *Ficus* are monoecious, and the rest are functionally dioecious¹². Many *Ficus* species are commonly used in traditional medicine to cure various diseases. They have long been used in folk medicine as astringents, carminatives, stomachics, vermifuges, hypotensives, antihelmintics and anti-dysentery drugs¹³. Many species are cultivated for shade and ornament in gardens. Several species produce edible figs of varying palatability. All species possess latex-like material within their vasculatures that provide protection and self-healing from physical assaults¹⁴. The fig is a very nourishing food and used in industrial products.

Figs contained water, fats, high amounts of amino acids, such as leucine, lysine, valine, and arginine, and minerals, such as potassium, calcium, magnesium, sodium, phosphorus and Vitamins¹⁵.

Taxonomy of *Ficus*:

Domain:	Eukaryota
Kingdom:	Plantae
Subkingdom:	Viridiaeplantae
Phylum:	Tracheophyta
Subphylum:	Euphyllophytina
Infraphylum:	Radiatopses
Class:	Magnoliopsida
Subclass:	Dilleniidae
Superorder:	Urticales
Order:	Urticales
Family:	Moraceae
Genus:	<i>Ficus</i>

Various Species of *Ficus* are:¹⁶

Ficus altissima (council tree)

Ficus aspera (clown fig)

Ficus auriculata, [Leaves, fruits, bark] syn. *Ficus roxburghii*

Ficus asperifolia [Young stems]

Ficus benghalensis (Indian banyan) [Wood, leaves, bark, roots]

Ficus benjamina (weeping fig) [Fruits]

Ficus benjamina 'Exotica

Ficus benjamina 'Comosa

Ficus binnendykii (narrow-leaf ficus)

Ficus carica (common edible fig) [Fruit latex, leaves]

Ficus celebinsis (willow ficus)

Ficus capensis [Leaves, stem bark]

Ficus deltoidea (mistletoe fig) syn. *Ficus diversifolia* [Leaves]

Ficus elastica (Indian rubber tree) [Young stems]

Ficus elastica 'Abidjan'

Ficus elastica 'Asahi'

Ficus elastica 'Decora'

Ficus elastica 'Gold'

Ficus elastica 'Schrijveriana'

Ficus exasperate [Leaves]

Ficus glomerata [Bark]

Ficus lacor (pakur tree)

Ficus lingua (box-leaved fig) syn. *Ficus buxifolia*

Ficus lyrata (fiddle-leaf fig) [Leaves, fruit latex]

Ficus macrophylla (Moreton Bay fig)

Ficus microcarpa (Chinese banyan)

Ficus microcarpa var. *crassifolia* (wax ficus)

Ficus microcarpa 'Variegata.'

Ficus nitida [Wood, bark, leaves, young stems]

Ficus palmata [Leaves, fruits, bark, root]

Ficus pseudopalma (Philippine fig)

Ficus pumila (creeping fig) syn. *Ficus repens*

Ficus polita [Roots]

Ficus racemosa [Roots, bark]

Ficus religiosa (bo tree or sacred fig) [Bark, fruits, leaves]

Ficus retusa [Aerial parts]

Ficus rubiginosa (Port Jackson fig or rusty fig)

Ficus rubiginosa 'Variegata.'

Ficus sagittata 'Variegata', syn. *Ficus radicans* 'Variegata'

Ficus saussureana, syn. *Ficus dawei*

Ficus stricta

Ficus subulata, syn. *Ficus salicifolia*

Ficus sycomorus [Fruits]

Ficus tikoua (Waipahu fig)

Ficus tsiela [Leaves]

Ficus religiosa: *Ficus religiosa* Linn. (Moraceae) commonly known as 'Peepal tree' is a large widely branched tree with leathery, heart-shaped, long tipped leaves on long slender petioles and purple fruits growing in pairs^{17, 18, 19}.

It is a large perennial tree, glabrous when young, found throughout the plains of India up to 170 m altitudes in the Himalayas²⁰ and is one of the most revered trees in Asia.



FIG. 1: PLANT OF *FICUS RELIGIOSA*

It is also known as, the sacred fig tree or Bo tree and is the most planted tree species near religious or spiritual places in Indian cities and villages. It grows up to elevations of 5,000 feet²¹.

History: *Ficus religiosa* has got mythological, religious and medicinal importance in Indian culture. References to *Ficus religiosa* are found in several ancient holy texts like Arthasastra, Puranas, Upanisads, Ramayana, Mahabharata, Bhagavadgita and Buddhist literature, etc.²² The Brahma Purana and the Padma Purana, relate how once, when the demons defeated the Gods, Vishnu hid in the peepal. The Skanda Purana also considers the peepal, a symbol of Vishnu. He is believed to have been born under this tree. Some believe that the tree houses the Trimurti, the roots being Brahma, the trunk Vishnu and the leaves Shiva. The Gods are said to hold their councils under this tree and so it is associated with spiritual understanding. The peepal is also closely linked to Krishna.

In the Bhagavad Gita, he says: "Among trees, I am the ashvattha." Krishna is believed to have died under this tree, after which the present Kali Yuga is said to have begun. According to the Skanda Purana, if one does not have a son, the peepal should be regarded as one. As long as the tree lives, the family name will continue. To cut down a peepal is considered a sin equivalent to killing a Brahmin, one of the five deadly sins or Panchapataka. According to the Skanda Purana, a person goes to hell for doing so. Some people are particular to touch the peepal only on a Saturday. The Brahma Purana explains why saying that Ashvattha and peepala were two demons who harassed people.

Ashvattha would take the form of a peepal and peepala the form of a Brahmin. The fake Brahmin would advise people to touch the tree, and as soon as they did, Ashvattha would kill them. Later they were both killed by Shani. Because of his

influence, it is considered safe to touch the tree on Saturdays. Lakshmi is also believed to inhabit the tree on Saturdays. Therefore it is considered auspicious to worship it. Women ask the tree to bless them with a son tying a red thread or red cloth around its trunk or on its branches²³.

Nomenclature: 'Ficus' is the Latin word for 'Fig,' the fruit of the tree. 'Religiosa' refers to 'religion' because the tree is sacred in both Hinduism and Buddhism and is very frequently planted in temples and shrines of both faiths. 'Bodhi' or its short form 'Bo' means 'supreme knowledge' or 'awakening' in the old Indian languages, (Bo-Tree) is a well-known symbol for happiness, prosperity, longevity and good luck. The name 'Sacred Fig' was given to it because it is considered sacred by the followers of Hinduism, Jainism and Buddhism²⁴.

'Pipal' relates (I believe) to the same ancient roots which give rise to English words like 'Pip' and 'Apple' and therefore mean something like 'fruit-bearing tree.' 'Ashwattha' and 'Ashvattha' come from an ancient Indian root word "Shwa" means 'morning' or 'tomorrow.' This refers to the fact that Ashwattha is the mythical Hindu world tree, both indestructible and yet ever-changing: the same tree will not be there tomorrow²⁵.

Taxonomy/Botanical Classification:²⁶

Domain: Eukaryota
 Kingdom: Plantae
 Subkingdom: Viridiaeplantae
 Phylum: Tracheophyta
 Subphylum: Spermatophytina
 Infraphylum: Angiospermae
 Class: Magnoliopsida
 Subclass: Dilleniidae.
 Super order: Urticanae
 Order: Urticales
 Family: Moraceae
 Division: Magnoliophyta
 Tribe: Ficeae
 Genus: *Ficus* (FY-kus) L.
 Specific epithet: *religiosa* L.

Common Names:²⁴

Assamese: Ahant

Bengali: Asvattha, Ashud, Ashvattha.

English: Pipal tree.

Gujrati: Jari, Piparo, Pipalo, Piplo.

Hindi: Pipal, Pipali.

Kannada: Arlo, Ranji, Basri, Ashvatthanara, Ashwatha, Aralimara, Araleghida, Ashvathamara, Basari, Ashvattha.

Kanarese: Arani, Ashwatha mara, Pippala, Ragi.

Kashmiri: Bad.

Malayalam: Arayal

Marathi: Pimpal, Pipal, Pippal.

Oriya: Aswatha.

Punjabi: Pipal, Pippal

Sanskrit: Ashvattha, Bodhidruma, Pippala, Shuchidruma, Vrikshraj, yajnika.

Tamil: Ashwarthan, Arasamaram, Arasan, Arasu, Arara.

Telgu: Ravichettu.

Habitat: *Ficus religiosa* is known to be a native Indian tree and thought to be originating mainly in Northern and Eastern India, where it widely found in uplands and plane areas and grows up to about 1650 meters or 5000 ft in the mountainous areas. It is also found growing elsewhere in India and throughout the subcontinent and Southern Asia, especially in Buddhist countries, wild or cultivated.

It is a familiar sight in Hindu temples, Buddhist monasteries and shrines, villages and at roadsides. People also like to grow this sacred tree in their gardens. *Ficus religiosa* has also been widely planted in many hot countries all over the world from South Africa to Hawaii and Florida, but it is not able to naturalize away from its Indian home, because of its dependence on its pollinator wasp, *Blastophaga quadraticeps*. An exception to this rule is Israel where the wasp has been successfully introduced²⁷.

Microscopy: An external feature of bark shows that bark differentiated into thick outer periderm and inner secondary phloem. The periderm is differentiated into phellem and phelloderm. Phellem zone is 360 mm thick, wavy, uneven in transection. Phellem cells are organized into thin tangential membranous layers, and older layers exfoliate in the form of thin membranes, whereas

phelloderm zone is broad and distinct and are turned into lignified sclereids. Secondary phloem differentiated into inner narrow non collapsed zone which consists of radial files of sieve tube membranes, axial parenchyma, gelatinous fibers, and outer collapsed phloem consists of dilated rays, crushed, obliterated sieve tube membranes, thick walled and lignified fibers, abundant tannin filled parenchyma cells²⁸.

Transverse section of bark shows rectangular to cubical, thick-walled cork cells and dead elements of the secondary cortex, consist of masses of stone cells; cork cambium distinct with rows of the newly formed secondary cortex, mostly composed of stone cells towards the periphery. Stone cells found scattered in large groups, rarely isolated; most of the parenchymatous cells of secondary cortex contain numerous starch grains and few prismatic crystals of calcium oxalate; secondary phloem a wide zone, consisting of sieve elements, phloem fibers in singles or groups of two and non lignified; numerous crystal fibers also present; in outer region sieve elements mostly collapsed while in inner region intact; phloem parenchyma mostly thick-walled; stone cells present in single or in small groups similar to those in secondary cortex; a

number of ray-cells and phloem parenchyma filled with brown pigments; prismatic crystals of calcium oxalate and starch grains present in a number of parenchymatous cells; medullary rays uni to multiseriate, wider towards outer periphery composed of thick-walled cells with simple pits; in tangential section ray cells circular to oval in shape; cambium when present, consists of 2-4 layers of thin-walled rectangular cells²⁹.

Phytochemistry: Phytochemistry is the chemistry of plants or chemical constituents of plants. Phytochemistry understood in pharmacy as the chemistry of natural products used as drugs or of drugs plants with the emphasis on biochemistry. The constituents are therapeutically active or inactive. The inactive constituents are structural constituents of the plants like starch, sugars, or proteins. The inactive constituents have however pharmaceutical uses. The active constituents are secondary metabolites, like alkaloids glycosides, volatile oils, tannins etc. They are single substances or usually mixtures of several substances. The secondary products of metabolism are formed from primary products and the plant is not able to reutilize them, and they are deposited in the cells and so are called secondary metabolites³⁰.

TABLE 1: CHEMICAL COMPOUNDS CONTAINED BY DIFFERENT PARTS OF *F. RELIGIOSA*

S. no	Plant part	Compound present
1	Roots	Tannins, wax, saponin, leucoanthocyanins, delphinindin-3-O- α -L-rhamnoside (II), Pelargonidin-3-O- α -L-rhamnoside, Leucocyanidine-3-O- β -D-galactosyl-cellobioside (III), Leucoanthocyanidin-20-tetratriaconten-2-one, pentatriacontan-5-one, 6 heptatria content-10-one, mesoanisital ³¹
2	Bark	Phenols, tannins, steroids, alkaloids, flavonoids, β -sitosteryl-d-glucoside, vitamin K, noctacosanol, methyl oleanolate, lanosterol, stigmaterol, lupen-3-one ³¹
3	Fruits	Proteins (4.9 %), essential amino acids (isoleucine and phenylalanine), flavonols (kaempferol, quercetine, myricetin), also contain good amount of total phenolic contents, total flavonoids, percent inhibition of linoleic acid ³² , asgaragine, tyrosine, undecane, tridecane, tetradecane, (e)- β -ocimene, α -thujene, α -pinene, β -pinene, α -terpinene, limonene, dendrolasine, α -ylangene, α -copaene, β -bourbonene, β -caryophyllene, α -trans bergamotene, aromadendrene, α -humulene, alloaromadendrene, germacrene, δ -cadinene, γ -cadinene
4	Seeds	Phytosteroline, β -sitosterol and its glycoside, albuminoids, carbohydrates, fatty matter, colouring matter, caoutchoue 0.7-1.5% ³³
5	Leaves	Campesterol, stigmaterol, isofucosterol, α -amyrin, lupeol, tannic acid, arginine, serine, aspartic acid, glycine, threonine, alanine, proline, tryptophan, tyrosine, methionine, , valine, isoleucine, leucine, n-nonacosane, n-hentricontanen, hexacosanol ³⁴⁻³⁶

F. religiosa releases oxygen all the time, which makes it different from other plants. Most of the

plants largely uptake Carbon dioxide (CO₂) and release oxygen during the day (photosynthesis) and

uptake oxygen and release CO₂ during the night (respiration). Some plants such as *F. religiosa* (peepal) can uptake CO₂ during the night also like a day because of their ability to perform a type of photosynthesis called Crassulacean Acid Metabolism (CAM). Peepal is a hemiepiphyte in its native habitat, i.e. the seeds germinate and grow as

an epiphyte on other trees and then when the host tree dies, they establish on the soil. It has been suggested that when they live as an epiphyte, they use CAM pathway to produce carbohydrates and when they live on soil, they switch to C₃ type photosynthesis³⁷.

Ethnopharmacology:

TABLE 2: ETHNOMEDICINAL USES OF DIFFERENT PARTS

Plant parts	Traditional uses (as/in)
Bark	Astringent, cooling, aphrodisiac, antibacterial against <i>Staphylococcus aureus</i> and <i>Escherichia coli</i> , gonorrhoea, diarrhea, dysentery, hemorrhoids, gastrohelcosis, anti-inflammatory, burns ³⁸
Leaves and tender shoots	Purgative, wounds, skin diseases ³⁸
Fruits	Asthma, laxative, digestive ³⁸
Seeds	Refrigerants, laxative ³⁸
Latex	Neuralgia, inflammation, haemorrhages ³⁸
Leaf juice	Asthma, cough, sexual disorders, diarrhea, haematuria, toothache, migraine, eye troubles, gastric problems, scabies ³⁸⁻⁴⁰
Dry fruit	Tuberculosis, fever, paralysis, hemorrhoids ⁴¹

Pharmacological Activities:

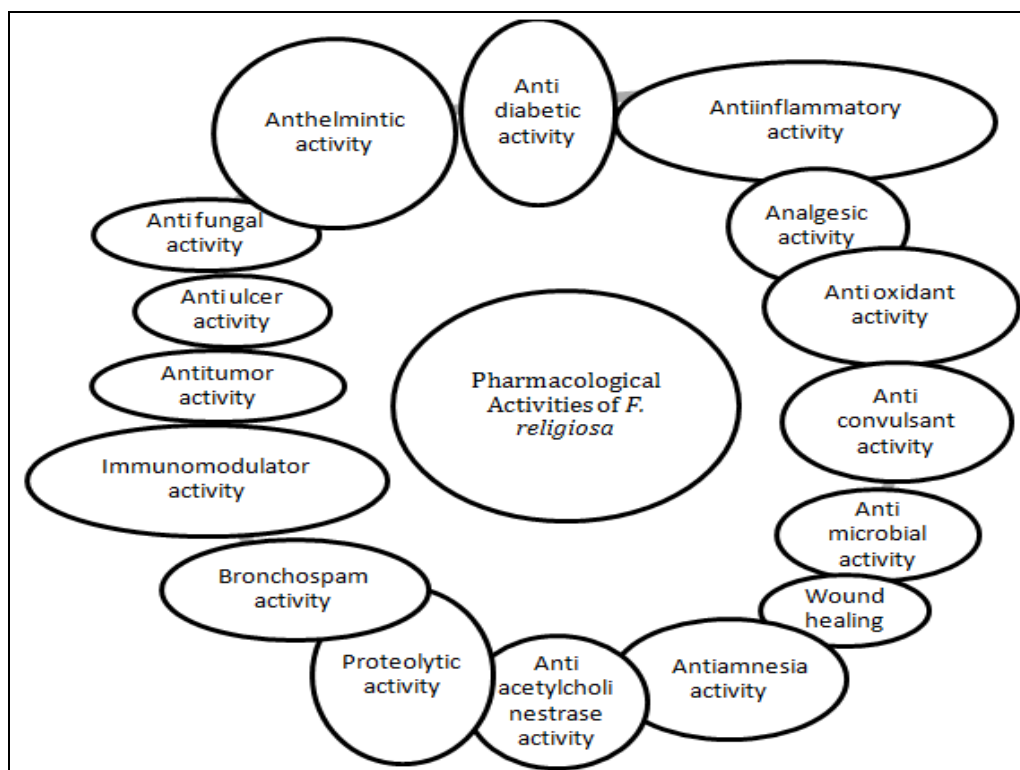


FIG. 2: PHARMACOLOGICAL ACTIVITIES OF *FICUS RELIGIOSA*

Anti-diabetic Activity: Aqueous extract in a dose of 50 and 100 mg/kg shows pronounced reduction in blood glucose levels in normal, glucose-loaded hyperglycemic and streptozotocin-induced diabetic rats and effect was compared with glibenclamide (a well known hypoglycaemic drug). Aqueous extract

of *F. religiosa* showed a significant increase in serum, insulin, body weight, glycogen content in liver and skeletal muscle of STZ induced diabetic rats. The results suggested potential traditional use of *F. religiosa*⁴².

Anti-inflammatory Activity: A study was investigated for the effect of methanol extract of *F. religiosa* leaf on lipopolysaccharide-induced production of NO and pro-inflammatory cytokines, such as tumor necrosis factor-alpha, interleukin beta (IL) and IL-6 in BV-2 microglial cells, a microglial mouse line. The methanol extract of leaf inhibited LPS-induced production of NO and proinflammatory cytokines in a dose-dependent manner⁴³. The methanolic extract of stem bark has shown significant anti-inflammatory activities orally. A significant anti-inflammatory effect has been observed in acute and chronic models of inflammation, the extract also protected mast cells from degradation induced by various degranulators⁴⁴, a paste of powdered bark is a good absorbent for inflammatory swellings and can be used to treat burns^{45, 46}.

Analgesic Activity: This activity of stem bark methanolic extract using the acetic acid-induced writhing (extension of the hind paw) model in mice. Aspirin was used as standard drugs. It exhibited a reduction in the number of writhing. This suggested that extract showed the analgesic effect probably by inhibiting synthesis or action of prostaglandins⁴⁷.

Antioxidant Activity: The ethanolic extract of leaves of *Ficus religiosa* was evaluated for antioxidant (DPPH) activity. The tested extract of different dilutions in the range 200 µg/ml to 1000 µg/ml shows antioxidant activity in a range of 6.34% to 13.35%⁴⁸. Root extracts showed significant antioxidant activity against carbon tetrachloride induced liver injury in rats⁴⁹. A recent study has also revealed that the methanol extract contains high total phenolic and total flavonoids contents, exhibits high antioxidant activity⁵⁰.

The antioxidant activity of the aqueous extract of *F. religiosa* was investigated in streptozotocin-induced diabetic rats. Since the oxidative stress is the major cause and consequence of Type 2 diabetes. Free radicals generated during oxidative stress damage the insulin receptors and thereby decrease the number of sites available for insulin function. The aqueous extract drug reported to contain tannins, flavonoids, and polyphenols. At doses 100 and 200 mg/kg of aqueous extracts of *F. religiosa* shows significant decrease in fasting

blood glucose and an increase in body weight of diabetic rats as compared to untreated rats. The results are suggesting that the *F. religiosa*, a Rasayana group of plant drug having antidiabetic along with antioxidant potential, was beneficial in the treatment of Type 2 diabetes⁵¹.

Anticonvulsant Activity: The methanol extract of figs (fruits) exhibits dose-dependent anticonvulsant activity against maximum electroshock and picrotoxin-induced convulsions through serotonergic pathways modulation. The anticonvulsant activity of the extract is studied in strychnine-, pentylenetetrazole, picrotoxin- and isoniazid-induced seizures in mice⁵². Acute toxicity, neurotoxicity, and potentiation of phenobarbitone induced sleep by extract were also studied⁵³.

Antimicrobial Activity: The antimicrobial activity of ethanolic extracts of *F. religiosa* (leaves) was examined using the agar well diffusion method. The test was performed against four bacteria: *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* and against two fungi: *Candida albicans* and *Aspergillus niger*. The results showed that 25mg/ml of the extract was active against all bacterial strains and effect against the two fungi was comparatively much less⁵⁴. *F. religiosa* (leaves) demonstrated the more antibacterial activity with less antifungal activity⁵⁵. *F. religiosa* bark methanolic extract was 100% lethal for *Haemonchus contortus* worms during in vitro testing⁵⁶. The chloroform extracts of *F. religiosa* showed a strong inhibitory activity against growth infectious *Salmonella typhi*, *Salmonella typhimurium* and *Proteus vulgaris* at a MIC of 39, 5 and 20 µg/ml respectively⁵⁷.

Wound Healing: The wound healing activity was investigated by excision and incision wound models using *F. religiosa* leaf extracts, prepared as an ointment (5 and 10%) were applied on Wistar albino strain rats. Povidine iodine 5% was used as a Standard drug. The high rate of wound contraction, decrease in the period for epithelialization, high skin breaking strength were observed in animals treated with 10% leaf extract ointment when compared to the control group of animals. It has been reported that tannins possess the ability to increase the collagen content, which is one of the factors for the promotion of wound healing^{48, 2}.

The ethanol bark extract was reported to possess wound healing⁵⁸.

Anti-amnesia Activity: The anti-amnesic activity was investigated using methanol extract of figs on scopolamine-induced anterograde and retrograde amnesia in mice. Figs were known to contain a high serotonergic content, and modulation of serotonergic neurotransmission plays a crucial role in the pathogenesis of amnesia⁵⁹.

Anti-acetylcholinesterase Activity: Methanolic extract of the stem bark of *F. religiosa* found to inhibit the acetylcholinesterase enzyme, thereby prolonging the half-life of acetylcholine. It was reported that most accepted strategies in Alzheimer's diseases treatment are the use of cholinesterase inhibitors. The calculated 50% inhibitory dose (ID₅₀) value was 73.69 µg/ml, respectively. The results confirm and justify the popular traditional use of this plant for the treatment of Alzheimer's diseases⁶⁰.

Proteolytic Activity: A comparison of the proteolytic activity of the latex of 46 species of *Ficus* has been done by electrophoretic and chromatographic properties of the protein components, and *F. religiosa* has shown a significant proteolytic activity⁶¹.

Bronchospasm Activity: The *in-vivo* studies of histamine-induced bronchospasm in guinea pigs and *in vitro* isolated guinea pig tracheal chain and ileum preparation were performed. Pre-treatment of guinea pigs with ketotifen (1 mg/kg, p.o.), has significantly delayed the onset of histamine aerosol-induced pre convulsive dyspnea, compared with vehicle control (281.8 ± 11.7 vs 112.2 ± 9.8). The administration of the methanolic extract (125, 250, and 500 mg/kg, p.o.) did not produce any significant effect on latency to develop histamine-induced pre-convulsive dyspnea. Methanolic extract of fruits at doses (0.5, 1 and 2 mg/ml) has significantly potentiated the EC₅₀ doses of both histamine and acetylcholine in isolated guinea pig tracheal chain and ileum preparation. HPLC analysis of methanolic extract showed the presence of high amounts of serotonin (2.89% w/w)⁶².

Immunomodulatory Activity: The immunomodulatory effect of alcoholic extract of the bark of *F. religiosa* (Moraceae) in mice was investigated.

The study was carried out by various hematological and serological tests. Administration of extract remarkably ameliorated both cellular and humoral antibody response. It is concluded that the test extract possessed promising immunostimulant properties⁶³.

Antibacterial and Antitumor Activity: The aqueous, methanol and chloroform extracts of the leaves of *Ficus religiosa* were evaluated for their antibacterial and antitumor activities. These extracts showed an elevated level of antibacterial activity and reduced antifungal activity. The most sensitive organisms *S. typhi*, *P. vulgaris*, *S. typhimurium*, and *E. coli* were inhibited even at lowest concentrations of the chloroform extracts. Aqueous and methanolic extracts were found to be less active. The antitumor activity conducted by crown gall potato disc assay proved that all the three extracts are efficient in reducing the tumors formed⁶⁴.

Antiulcer Activity: The antiulcer potential of the ethanol extract of stem bark of *Ficus religiosa* against *in vivo* indomethacin, cold restrained stress-induced gastric ulcer, and pylorus ligation assays were validated. The extract (100, 200, and 400 mg/kg) significantly (P<0.05) reduced the ulcer index in all assays used. The extract also significantly increased the pH of gastric acid while at the same time reduced the volume of gastric juice, free and total acidities. The study provides preliminary data on the antiulcer potential of *Ficus religiosa* stem bark and supports the traditional uses of the plant for the treatment of gastric ulcer⁶⁵.

Antifungal Activity: The benzene extract of both the plants, *i.e.* *Ficus infectoria* Roxb. and *Ficus religiosa* Linn. afforded furanocoumarins, bergapten, and bergaptol. The isolated compounds of both the plants were assayed against its microorganisms *Staphylococcus aureus*, *Escherichia coli*, *Penicillium glaucum*, and *Paramecium* at a concentration of 0.2% for aqueous bark extracts and 1x10⁻² M for the isolated compounds. The results indicate bacterial activity of both the compounds bergapten and bergaptol against *S. aureus* and *E. coli*. Antifungal activity of the compounds against *P. glaucum* was also observed⁶⁶.

Anthelmintic Activity: *Ficus religiosa* has been used to treat parasitic infections in man and animals. The anthelmintic effect of methanolic bark extract of *F. religiosa* on the adult *Haemonchus contortus* Worm. Adult motile *H. Contortus* was collected from the gastrointestinal tract of sheep slaughtered at Faisalabad slaughterhouse. It was found that ficin is responsible for the anthelmintic effect in the methanolic extract of *F. religiosa*⁶⁷. Further, studies show that the aqueous extract of the fruit of *F. religiosa* has shown potent Anthelmintic activity as compared to other species of *Ficus* against *Pheretima posthuma* (earthworms).

CONCLUSION: India is the largest producer of medicinal herbs and is rightly called the botanical garden of the world. The study of herbal medicine spans the knowledge of pharmacology, history, source, physical and chemical nature, mechanism of action, traditional medicinal, and therapeutic use of the drug.

F. religiosa is a widely branched deciduous tree with leathery, heart-shaped, long tipped leaves used in the Indian system of medicine since very ancient times. It is one of the versatile plant having a wide variety of medicinal activities therefore used in the treatment of several types of diseases, for example, Diarrhoea, diabetes, urinary disorders, burns, hemorrhoids, gastrohelcosis, skin diseases, convulsion, tuberculosis, fever, paralysis, oxidative stress, bacterial infection, etc.

Presently, there is an increasing interest worldwide in herbal medicines accompanied by increased laboratory investigation into the pharmacological properties of the bioactive ingredients and their ability to treat various diseases. With the availability of primary information, further studies can be carried out like phyto pharmacology of different extracts, standardization of the extracts, identification and isolation of active principles and pharmacological studies of isolated compound. These may be followed by development of lead molecules as well as it may serve for the purpose of use of specific extract in specific herbal formulation.

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CONFLICT OF INTEREST: Nil

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