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 plant having a wide variety of medicinal activities, therefore, used in treatment of several types of diseases, eg, diarrhoea, diabetes, urinary disorders, burns, haemorrhoids, 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.

INTRODUCTION: Medicinal plants are naturally gifted with invaluable bioactive compounds which form the backbone of traditional medicines. With a view to increasing 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 disease. The use of plants as medicines antedates history. 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 plants.

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 sub tropical forests worldwide. 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.

The history of herbal medicine is almost as old as human civilization and traditional medicines from plants have attracted major attention worldwide because of their potential pharmaceutical importance. 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 Homoeopathy. Any part of the plant may contain active components like bark, leaves, flowers, roots, fruits, seeds, etc. The beneficial medicinal effects of plant materials typically result from the combinations of secondary products present in the plant.
which produce commercial fruit called fig. 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 dioecious. 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, vermicides, hypotensives, anthelmintics and anti-dysentery drugs. 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 assaults. 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 Vitamins.

**Taxonomy of Ficus:**

**Domain:** Eukaryota  
**Kingdom:** Plantae  
**Subkingdom:** Viridaeplantae  
**Phylum:** Tracheophyta  
**Subphylum:** Euphyllophytina  
**Infraphylum:** Radiatopses  
**Class:** Magnoliopsida  
**Subclass:** Dilleniidae  
**Superorder:** Urticanae  
**Order:** Urticales  
**Family:** Moraceae  
**Genus:** Ficus

**Various species of Ficus are:**

- *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 binnendyki* (narrow-leaf ficus)  
- *Ficus carica* (common edible fig) [Fruit latex, leaves]  
- *Ficus celebensis* (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 pseudopalm* (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 17-19. It is a large perennial tree, glabrous when young, found throughout the plains of India upto 170 m altitude in the Himalayas 20 and is one of the most revered trees in Asia. 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 feet 21.

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 red thread or red cloth around its trunk or on its branches 23.

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 texts like Arthasastra, Puranas, Upanisads, Ramayana, Mahabharta, Bhagavadgita and Buddhistic literature etc 22.

The Brahma Purana and the Padma Purana, relate how once, when the demons defeated the Gods, Vishnu hide 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.

History:
Ficus religiosa has got mythological, religious and medicinal importance in Indian culture. References to Ficus religiosa are found in several ancient holy
'supreme knowledge' or 'awakening' in the old Indian languages, (Bo-Tree) is 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 Buddhism.24

'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'.

'Ashvattha' and 'Ashvattha' come from an ancient Indian root word "Shwa" means 'morning' or 'tomorrow'. This refers to the fact that Ashvattha is the mythical Hindu world tree, both indestructible and yet ever-changing: the same tree will not be there tomorrow.25

**Taxonomy/Botanical classification:** 26

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

**Common Names:** 24

**Assamese:** Ahant  
**Bengali:** Asvattha, Ashud, Ashvattha.  
**English:** Pipal tree.  
**Gujrati:** Jari, Piparo, Pipalo, Piplo.  
**Hindi:** Pipal, Pipali.


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.

**Habita:**  
*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 quadricipes. An exception to this rule is Israel where the wasp has been successfully introduced 27.

**Microscopy:**  
An external feature of bark shows that bark differentiated into outer thick periderm and inner secondary phloem. Periderm is differentiated into phellem and phelloderm. Phellem zone is 360 mm thick, wavy, uneven in transection. Phellem cells are organised 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 cells 28.

Transverse section of bark shows rectangular to cubical, thick walled cork cells and dead elements of secondary cortex, consist of masses of stone cells; cork cambium distinct with rows of newly formed secondary cortex, mostly composed of stone cells towards periphery. Stone cells found scattered in large groups, rarely isolated; most of 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 in 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 cells 29.

**Phytochemistry:**
Phyto chemistry is the chemistry of plants or chemical constituents of plants. Phyto chemistry 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 active 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 metabolites 30.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Plant part</th>
<th>Compound present</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Roots</td>
<td>Tannins, wax, saponin, leucoanthocyanins, delphinidin-3-O-α-Lrhamnoside (II), Pelargonidin-3-O-α-Lrhamnoside, Leucocyanidine-3-O-β-D-galactosyl-cellobioside (III), Leucoanthocyanidin-20-tetratriaconten-2-one, pentatriacontan-5-one, 6-heptatriacontan-10-one, mesoanisiositol 31.</td>
</tr>
<tr>
<td>2)</td>
<td>Bark</td>
<td>Phenols, tannins, steroids, alkaloids, flavonoids, β-sitosterol-3-glucoside, vitamin K, nootkaosanol, methyl oleanolate, lanosterol, stigmasterol, lupen-3-one 31.</td>
</tr>
<tr>
<td>3)</td>
<td>Fruits</td>
<td>Proteins (4.9 %), essential amino acids (isoleucine and phenylalanine), flavonols (kaempferol, quercetin, myricetin), also contain good amount of total phenolic contents, total flavonoids, percent inhibition of linoleic acid 32, asgaragine, tyrosine, undecane, tridecane, tetradecane, (e)-β-oicimene, α-thujene, α-pinene, β-pinene, α-terpinene, limonene, dundrolasine, α-ylangene, α-copaene, β-bourbonene, β-caryophyllene, α-trans bergamotene, aromadendrene, α-humulene, alloaromadendrene, germacrene, δ-cadinenene, γ-cadinene.</td>
</tr>
<tr>
<td>4)</td>
<td>Seeds</td>
<td>Phytosterol, β-sitosterol and its glycoside, albuminoids, carbohydrates, fatty matter, colouring matter, caoutchouc 0.7-1.5% 33.</td>
</tr>
<tr>
<td>5)</td>
<td>Leaves</td>
<td>Campestrol, stigmasterol, isofucosterol, α-amyrin, lupeol, tannic acid, arginine, serine, aspartic acid, glycine, threonine, alanine, proline, tryptophan, tyrosine, methionine, valine, isoleucine, leucine, n-nonacosane, n-hentricontenane, hexacosan. 34-36.</td>
</tr>
</tbody>
</table>

_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 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 epiphyte, they use CAM pathway to produce carbohydrates and when they live on soil, they switch to C3 type photosynthesis.

**Ethnopharmacology:**

**TABLE 2: ETHNOMEDICINAL USES OF DIFFERENT PARTS**

<table>
<thead>
<tr>
<th>Plant parts</th>
<th>Traditional uses (as/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bark</td>
<td>Astringent, cooling, aphrodisiac, antibacterial against <em>Staphylococcus aureus</em> and <em>Escherichia coli</em>, gonorrhoea, diarrhoea, dysentery, haemorrhoids, gastrohelcosis, anti-inflammatory, burns.</td>
</tr>
<tr>
<td>Leaves and tender shoots</td>
<td>Purgative, wounds, skin diseases.</td>
</tr>
<tr>
<td>Fruits</td>
<td>Asthma, laxative, digestive.</td>
</tr>
<tr>
<td>Seeds</td>
<td>Refrigerants, laxative</td>
</tr>
<tr>
<td>Latex</td>
<td>Neuralgia, inflammation, haemorrhages.</td>
</tr>
<tr>
<td>Leaf juice</td>
<td>Asthma, cough, sexual disorders, diarrhea, haematurea, toothache, migraine, eye troubles, gastric problems, scabies.</td>
</tr>
<tr>
<td>Dry fruit</td>
<td>Tuberculosis, fever, paralysis, haemorrhoids.</td>
</tr>
</tbody>
</table>

**Pharmacological activities:**

**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 glybenclamide (a well known hypoglycaemic drug). Aqueous extract of *F. religiosa* showed 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*.
Anti inflammatory activity:
A study was investigated for the effect of methanol extract of *F. religiosa* leaf on lipopolysaccharide-induced production of NO and proinflammatory cytokines, such as tumor necrosis factor-alpha, interleukin beta (IL) and IL-6 in BV-2 microglial cells, a mouse microglial line. Methanol extract of leaf inhibited LPS-induced production of NO and proinflammatory cytokines in a dose dependent manner 43.

The methanolic extract of stem bark has shown significant anti inflammatory activities orally. A significant anti inflammatory effects has been observed in acute and chronic models of inflammation, the extract also protected mast cells from degradation induced by various degranulators 44, 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 hind paw) model in mice. Aspirin were used as standard drugs. It exhibited reduction in the number of writhing. This suggested that extract showed the analgesic effect probably by inhibiting synthesis or action of prostaglandins 47.

Antioxidant activity:
The ethanolic extract of leaves of *Ficus religiosa* was evaluated for antioxidant (DPPH) activity. The tested extract of different dilutions in range 200 µg/ml to 1000 µg/ml shows antioxidant activity in range of 6.34% to 13.35% 48. Root extracts showed significant antioxidant activity against carbon tetrachloride induced liver injury in rats 49. Recent study has also revealed that the methanol extract contain high total phenolic and total flavonoids contents, exhibits high antioxidant activity 50.

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 significantly decrease in fasting blood glucose and increase in body weight of diabetic rats as compared to untreated rats. The results suggesting that the *F. religiosa*, a rasayana group of plant drug having antidiabetic along with antioxidant potential was beneficial in treatment of type 2 diabetes 51.

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-, pentylentetrazole, picrotoxin- and isoniazid- induced seizures in mice 52. Acute toxicity, neurotoxicity and potentiation of phenobarbitone induced sleep by extract were also studied 53.

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 less 54. *F. religiosa* (leaves) demonstrated more antibacterial activity with less antifungal activity 55. *F. religiosa* bark methanolic extract was 100% lethal for Haemonchus. contortus worms during in vitro testing 56. 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 respectively 57.

Wound healing:
The wound healing activity was investigate by excision and incision wound models using *F. religiosa* leaf extracts, prepared as ointment(5 and 10%) were applied on Wistar albino strain rats. Povidine iodine 5% was used as Standard drug. High rate of wound contraction, decrease in the
period for epithelialisation, 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 ability to increase the collagen content, which is one of the factor for promotion of wound healing. The ethanol bark extract was reported to possess wound healing.

**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 amnesia.

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

**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 showed a significant proteolytic activity.

**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. Pretreatment of guinea pigs with ketotifen (1 mg/kg, p.o.), has significantly delayed the onset of histamine aerosol induced preconvulsive dyspnea, compared with vehicle control (281.8 ± 11.7 vs112.2 ± 9.8). The administration of methanolic extract (125, 250 and 500 mg/kg, p.o.) did not produce any significant effect on latency to develop histamine induced preconvulsive dyspnea. Methanolic extract of fruits at a doses (0.5, 1 and 2 mg/ml) has significantly potentiate 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).

**Immuno modulatory 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 tic rats while there was humoral antibody response. It is concluded that the test extract possessed promising immunostimulant properties.

**Anti bacterial and anti tumor activity:**
The aqueous, methanol and chlorophorm 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 a 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 formed.

**Antifungal activity:**
The benzene extract of both the plants *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*, *E. scherichia coli*, *Penicillium glaucum* and *Paramecium* at 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*. An antifungal activity of the compounds against *P. glaucum* was also observed.

### Anthelmintic activity:

*Ficus religiosa* have been used to treat the 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*.

Further, studies show that the aqueous extract of 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, tradional, medicinal and therapeutic use of 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 treatment of several types of diseases for example Diarrhhea, diabetes, urinary disorders, burns, haemorrhoids, gastrohecalosis, 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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