

# Ayurveda (Part3)



# *Carum copticum* (Ajowan)

## Carom seeds or Thymol seeds

Botanical name: *Carum copticum*

Family: Umbelliferae (Apiaceae)

Part used: fruit/seed



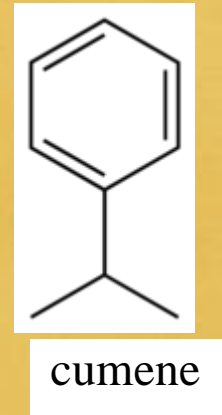
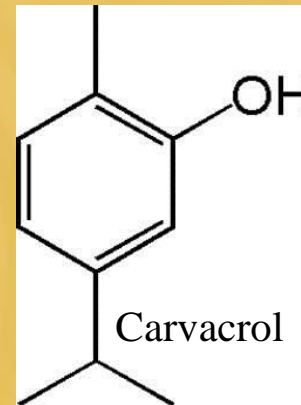
### Ayurvedic uses:

1. It has **kapha** and **vata** pacifying nature.
2. It has a pungent nature and used as a spice.
3. A decoction of the seeds of the plant is used for curing diarrhoea, amoebiasis, febrile conditions and stomach disorders.
4. In the Ayurvedic system, ajowan is used as an enhancer of body's resistance.
5. It is often used in respiratory troubles and a variety of allergies.

# Chemical Constituents

The phytochemical studies on *C. copticum* have revealed the presence of multiple constituents including

- Carvacrol
- Cumene
- Amino acids like lysine and threonine
- Calcium, iron
- Tannins
- Dietary fibres

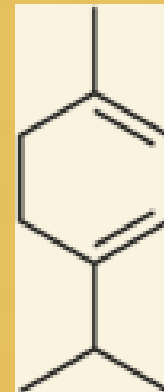


The seeds also contain **essential oil** (2–3%), which contain thymol (40–50%)

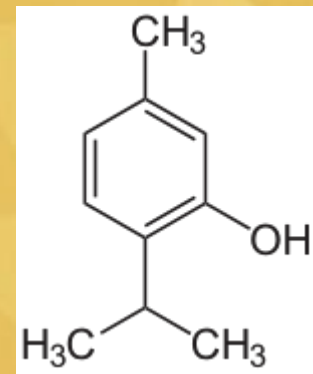
terpinene

p-cymene

pinene



$\alpha$ -Terpinene



thymol

# Ayurvedic Preparation from *Carum sp.*

---

In southern parts of India, dry ajowan seeds are powdered and soaked in milk, which is then filtered and fed to babies.

It is assumed to relieve colic and **improve digestion** and **appetite in babies**.

## A preparation for gastric complains

- Soak *C. copticum* seeds in fresh ginger juice, and dry in shade.
- Then, soak them in fresh lime and dry again.
- Later, soak in mint juice and papaya sap and dry again.
- Powder the processed dry seeds and preserve in a clean airtight container.
- A pinch of the powder immediately taken after food is good for digestive troubles such as heartburn, indigestion flatulent colic, diarrhoea due to indigestion, and gastrointestinal infection.

# Pharmacological activities

## 1. Bronchodilator activity:

An *in vivo* study performed on rats showed that the aqueous and methanolic extract of *C. copticum* had a **bronchodilatory** effect. Another study showed *C. copticum* to be as effective as theophylline in treating asthma.

## 2. Anti-tussive activity:

*In vivo* study suggested that *C. copticum* is more powerful than codeine as anti-tussive agent.

## 3. Anti-inflammatory activity:

Both alcoholic and aqueous extracts of the seeds of *C. copticum* showed an inhibitory effect on carrageenan induced rat paw oedema. In addition, the plant is proved to possess antibacterial, anthelmintic, antifungal and hypocholesteraemic activities.

## *Terminalia arjuna* (Arjuna)

Botanical name: *Terminalia arjuna*, part used: bark

Family: Combretaceae.

### Ayurvedic uses:

- The arjuna is an Ayurvedic cardioprotective botanical being used in Ayurveda since 2500 B.C.
- It has remarkable cardioprotective and heart muscle strengthening properties.
- Arjuna is the most extensively used herb in heart related problems. It is present in almost all kinds of herbal heart related medicine.
- It is cooling herb with **kapha** and **pitta** pacifying properties.
- It is traditionally prepared as a milk decoction.
- The extract of the plant has been used as expectorant, aphrodisiac, tonic and diuretic.
- In the Ashtānga Hridayam, arjuna is mentioned for the treatment of wounds, hemorrhages and ulcers.
- Vagbhata advised it to be applied locally with honey for acne.





ASTANGA  
HRIDAYAM  
OF  
VAGHBHATA

CW  
comfort-wear

BUY  
FROM  
AUTHENTIC  
SELLER

100%  
NEW, FRESH  
&  
AUTHENTIC

100% Pure Herbal Powder  
**ARJUNA**  
100 gm / 3.52 oz

**PURE & NATURAL HERB POWDER**

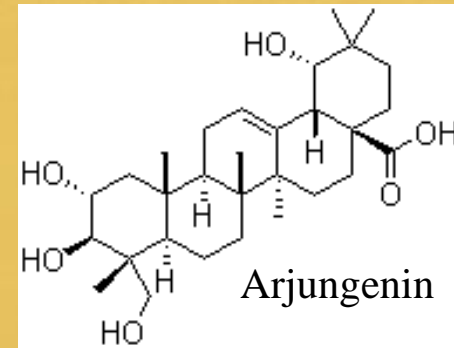
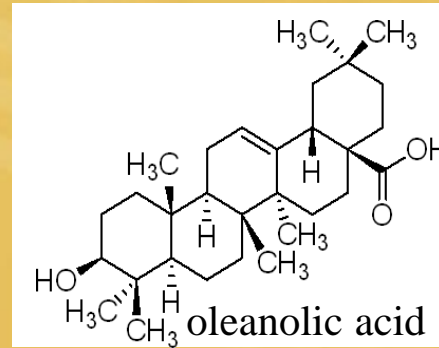
# Chemical Constituents

Main chemical constituents are:

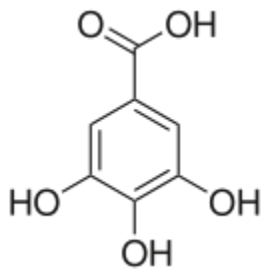
- Triterpenoid saponins (arjunetosides).
- Arjungenin (Trihydroxyoleanolic acid).
- Arjunic acid.
- Flavonoids.
- Tannins, gallic acid, ellagic acid.
- Minerals like calcium, magnesium, zinc, and copper are also present.

Arjuna also contains

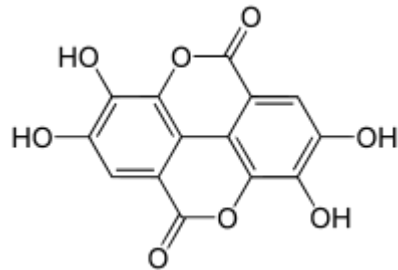
- Coenzyme Q10 (ubiquinone).



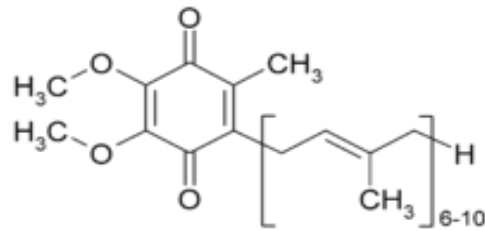
Gallic acid



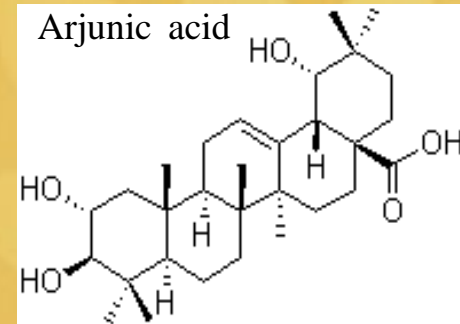
ellagic acid



coenzyme Q10



Arjunic acid







# Pharmacological Activities

---

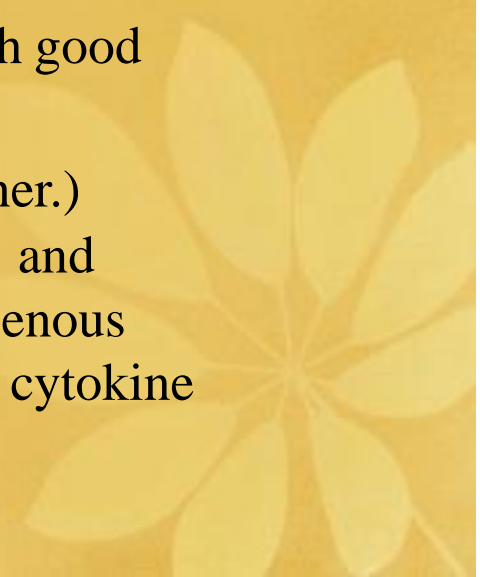
## 1. Antihypertensive effect:

IV injection of 70% alcoholic extract of T. arjuna caused dose dependent hypotension in anaesthetized dogs. Hypotension was supposed to be due to peripheral mechanisms.

## 2. Cardio-protective and cardio-tonic:

A placebo controlled study showed that the bark extract (500 mg four times a day) caused improvement in clinical and treadmill exercise parameters as compared to placebo. The benefits were found to be comparable with Isosorbide mononitrate (40 mg /day) and with good tolerance.

A study performed on rats in 2011 (J. Cardiovasc. Pharmacol. Ther.) proved that T. arjuna exerts beneficial effect on LV functions and autonomic control in CHF possibly through maintaining endogenous antioxidant enzyme activities, inhibiting lipid peroxidation and cytokine levels.





---

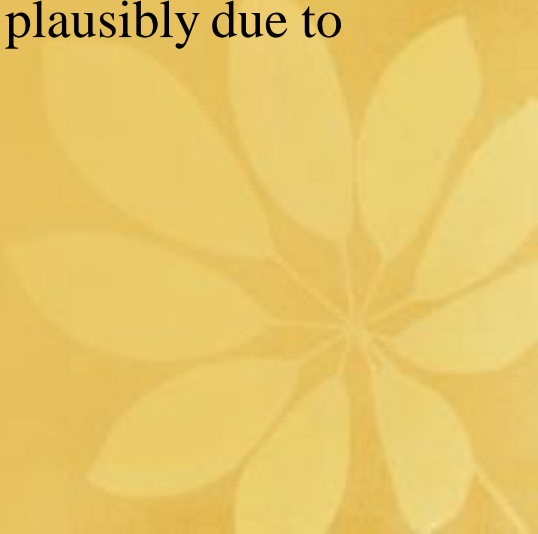
### 3. Hypolipidemic effects:

Researches showed T. arjuna extract to decrease triglycerides and cholesterol levels to normal.

MOA: It enhances the turnover cycle of LDL-cholesterol in Liver - by inhibiting the oxidation of LDL. As well as suppression of cholesterol biosynthesis in liver.

### 4. Anti-hyperglycemic activity:

A study performed in 2011 showed that T. arjuna leaf extract demonstrated remarkable anti-hyperglycemic activity in STZ-induced diabetic rats. The potential antihyperglycemic action is plausibly due to its underlying antioxidant role.



# *Ficus religiosa* (Peepal tree, Beepul tree, Bo-Tree)

---

Botanical name: *Ficus religiosa*

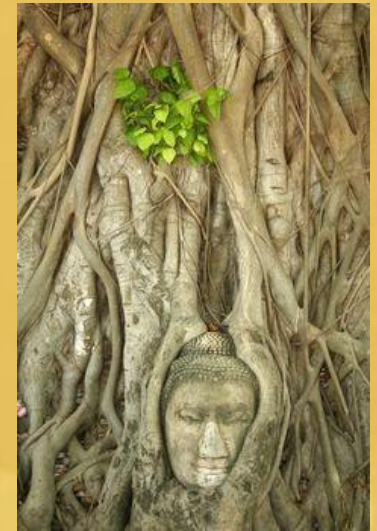
Family: Moraceae

It is a sacred tree native to India, part used: bark and fruits



## Cultural importance of peepal tree:

- ∞ The Buddhist regard Peepal tree as the personification of Buddha.
- ∞ Peepal tree is considered highly sacred, as people believe that Buddha was born under and also where he sat for six years of meditation and enlightenment..
- ∞ According to the Buddha – 'He who worships the Peepal tree will receive the same reward as if he worshiped me in person'.
- ∞ People tie threads of white, red and yellow silk around it to pray for progeny and rewarding parenthood.
- ∞ It is **kapha** and **pitta** suppressant.





# Ficus religiosa (Peepal Tree)



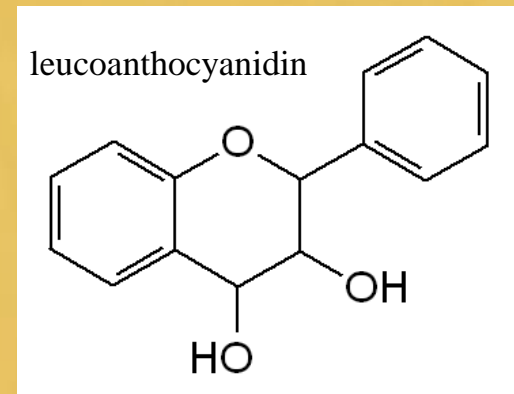
## Ayurvedic uses:

- *F. religiosa* is a well known ethnomedicinal tree used in Ayurveda for a number of medicinal purposes.
- Raw juice of the peepal plant leaf is very effective in arresting excessive bleeding.
- Juice from the root bark heals ulcers and is effective against gout and stomatitis.
- Chewing the roots of this tree, is known to prevent gum disease.
- Peepal is an excellent remedy for the neck disease scrofula, that causes swollen lymphatic glands. A paste prepared by mashing its roots under water, is applied on the affected region of the neck.
- Peepal leaves have been used against bruises and wounds for years.
- Ground leaves mixed with jaggery are made into pills. One pill taken daily with milk, is an effective pain killer.

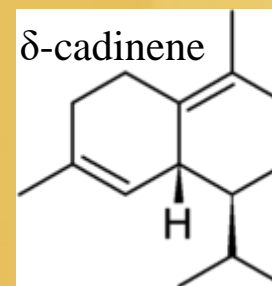
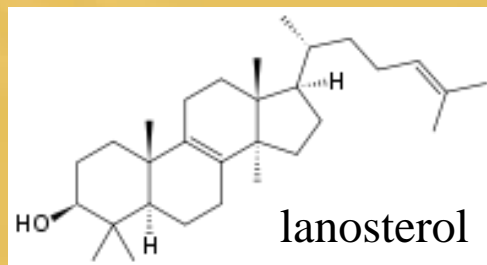
# Chemical Constituents

Preliminary phytochemical screening of *F. religiosa* barks, showed the presence of many constituents such as:

- Tannins
- Flavonoids (quercetin)
- Triterpenoids (lanosterol, Lupeol and lupeol acetate)
- sterols ( $\beta$ -sitosterol)
- Bicyclic sesquiterpenes ( $\delta$ -cadinene)
- Leucoanthocyanidin, and leucoanthocyanin
- Vitamin K



The fruits of this plant contain numerous amino acids like asparagine and tyrosine.



# Pharmacological activities

---

## 1. Anti-cancer activity:

Fruit extracts of *Ficus religiosa* exhibited antitumor activity in the potato disc bioassay.

## 2. Anti-diabetic activity:

Aqueous extract of *F. religiosa* showed a pronounced reduction in blood glucose level in normal, glucose loaded hyperglycemic and streptozotocin (STZ) induced diabetic rats. the effect was compared with the known hypoglycemic drug glybenclamide.

Aqueous extract of *F. religiosa* showed significant increase in serum insulin, body weight, glycogen content in liver and skeletal muscles of STZ induced diabetic rabbits, also reduced the serum triglyceride and total cholesterol level.

# Pharmacological activities

---

## 3. Analgesic activity:

The analgesic activity of the *F. religiosa* stem bark methanolic extract was investigated using the acetic acid-induced writhing in mice. Aspirin was used as standard drug. *F. religiosa* extract exhibited reduction in the number of writhing. It was suggest that extract showed the analgesic effect probably by inhibiting synthesis or action of prostaglandins.

## 4. Anticonvulsant activity:

An exhaustive study was performed on fruits of *F. Religiosa* showed promising anticonvulsant activity in experimental model were seizure induced by maximum electroshock (MES), picrotoxin and pentylenetetrazol (PTZ).





Contents lists available at [ScienceDirect](#)

## Asian Pacific Journal of Tropical Medicine

journal homepage: [www.elsevier.com/locate/apjtm](http://www.elsevier.com/locate/apjtm)



Document heading      doi:

# Anticancer activity of *Tephrosia purpurea* and *Ficus religiosa* using MCF 7 cell lines

Vishal Gulecha\*, Thangavel Sivakuma

Nandha College of Pharmacy, Erode, Tamilnadu, India

### ARTICLE INFO

#### Article history:

Received 24 March 2011

Received in revised form 11 May 2011

Accepted 15 May 2011

Available online 20 July 2011

#### Keywords:

*Tephrosia purpurea*

*Ficus religiosa*

MCF 7 cell line

trypan blue

### ABSTRACT

**Objective:** To investigate anticancer activity of different fractions of *Tephrosia purpurea* [TP] (Sharapunkha, Fabaceae) and *Ficus religiosa* [FR] (Peepal, Moraceae). **Methods:** The fractions of TP and FR were prepared and tested for *in vitro* anticancer activity using human MCF 7 cell line by trypan blue exclusion method. **Results:** The result showed that among all these fractions of TPI, TPIII, FRI and FRIII showed better anticancer activity compared to other fractions. The IC<sub>50</sub> value for TPI (152.4  $\mu$  M), TPIII (158.71  $\mu$  M), FRI (160.3  $\mu$  M) and for FRIII (222.7  $\mu$  M) was observed. **Conclusions:** The present study shows anticancer potential of TP and FR fractions in MCF 7 cell line.



Contents lists available at ScienceDirect

## Journal of Ethnopharmacology

journal homepage: [www.elsevier.com/locate/jethpharm](http://www.elsevier.com/locate/jethpharm)



# Antidiabetic effect of *Ficus religiosa* extract in streptozotocin-induced diabetic rats

Rucha Pandit<sup>a,\*</sup>, Ashish Phadke<sup>b</sup>, Aarti Jagtap<sup>a</sup>

<sup>a</sup> Department of Pharmacology, Bombay College of Pharmacy, Kalna, Mumbai, India

<sup>b</sup> Centre for Ayurveda and Panchakarma Therapy, Vashi, Navi Mumbai, India

### ARTICLE INFO

#### Article history:

Received 3 December 2007

Received in revised form

29 December 2009

Accepted 12 January 2010

Available online 18 January 2010

#### Keywords:

*Ficus religiosa*

Diabetes mellitus

Antidiabetic

Antihyperlipidemic

Antilipidperoxidative

### ABSTRACT

**Aims of study:** In Indian traditional system of medicine, *Ficus religiosa* (Family Moraceae) is prescribed for the treatment of diabetes mellitus. In the present study, the antidiabetic effect of aqueous extract of *Ficus religiosa* bark (FRAE) was investigated in normal, glucose-loaded hyperglycemic and streptozotocin (STZ)-induced diabetic rats.

**Materials and methods:** Oral administration of FRAE at the doses of 25, 50 and 100 mg/kg was studied in normal, glucose-loaded and STZ-diabetic rats.

**Results:** The three doses caused significant reduction in blood glucose levels in all the models. The effect was more pronounced in 50 and 100 mg/kg than 25 mg/kg. FRAE also showed significant increase in serum insulin, body weight and glycogen content in liver and skeletal muscle of STZ-induced diabetic rats while there was significant reduction in the levels of serum triglyceride and total cholesterol. FRAE also showed significant antilipidperoxidative effect in the pancreas of STZ-induced diabetic rats. The antidiabetic effect of *Ficus religiosa* was compared with glibenclamide, a well-known hypoglycemic drug.

**Conclusion:** The results indicate that aqueous extract of *Ficus religiosa* bark possesses significant antidiabetic activity.



Contents lists available at ScienceDirect

## Journal of Ethnopharmacology

journal homepage: [www.elsevier.com/locate/jethpharm](http://www.elsevier.com/locate/jethpharm)



### Anticonvulsant activity of aqueous root extract of *Ficus religiosa*

Minal S. Patil<sup>a</sup>, C.R. Patil<sup>b</sup>, S.W. Patil<sup>c</sup>, R.B. Jadhav<sup>a,\*</sup>

<sup>a</sup> *Bioecology Laboratory, Department of Pharmacognosy, R.C. Patel Institute of Pharmaceutical Education & Research, Shrirpur, Dist. Dhule 425405 (Maharashtra), India*

<sup>b</sup> *Department of Pharmacology, R.C. Patel Institute of Pharmaceutical Education & Research, Shrirpur 425405, India*

<sup>c</sup> *Ojas Apt., B-402, Pashan-Banner Link Road, Pashan, Pune 411021, India*

#### ARTICLE INFO

##### Article history:

Received 21 March 2010

Received in revised form 30 June 2010

Accepted 4 September 2010

Available online 15 September 2010

##### Keywords:

*Ficus religiosa*

Anticonvulsant

Zinc

Magnesium

GABA

Glycine

#### ABSTRACT

**Ethnopharmacological relevance:** *Ficus religiosa* Linn is frequently used for the treatment of nervous disorders among Pawara tribe of the Satpuda range, India.

**Aim of the study:** This study aimed to investigate the anticonvulsant activity of the aqueous aerial root extract of *Ficus religiosa* in chemoconvulsant-induced seizures in mice.

**Materials and methods:** The anticonvulsant activity of the extract (25, 50 and 100 mg/kg, p.o.) was investigated in strychnine-, pentylenetetrazole-, picrotoxin- and isoniazid-induced seizures in mice. Rat ileum and fundus strip preparations were used to study the effect of the extract on acetylcholine (Ach)- and serotonin (5-HT)-induced contractions, respectively.

**Results:** The extract showed no toxicity and protected the animals in the strychnine and pentylenetetrazole tests in a dose-dependent manner. Its effect in the picrotoxin and isoniazid tests, however, was less potent. The extract also exhibited dose-dependent potentiation of Ach in rat ileum but failed to potentiate the effect of 5-HT in rat fundus strip preparation.

**Conclusions:** The results suggest that an orally administered aqueous root extract of *Ficus religiosa* has dose-dependent and potent anticonvulsant activities against strychnine- and pentylenetetrazole-induced seizures. The observed activities may be ascribed to the appreciable content of zinc and magnesium in the extract.



Document heading      doi: 10.1016/S2221-1691(13)60112-4      © 2013 by the Asian Pacific Journal of Tropical Biomedicine. All rights reserved.

## Anti-ulcer activity of *Ficus religiosa* leaf ethanolic extract

Marslin Gregory<sup>1,2</sup>, B. Divya<sup>3</sup>, Revina Ann Mary<sup>4</sup>, M. M. Hipolith Viji<sup>5</sup>, V. K. Kalaichelvan<sup>1</sup>, V. Palanivel<sup>1,3\*</sup>

*Department of pharmacology, Annamalai University, Chidambaram, India*

*Centre for the Research and Technology of Agro-Environment and Biological Sciences (CITAB), Department of Biology, University of Minho, Portugal*

*Padmavathi College of Pharmacy and Research Institute, Periyanaahalli, Dharmapuri, Tamilnadu, India*

*Department of Nursing Science, A.J College of Nursing, Chennai, Tamilnadu, India*

*Department of Phytochemistry, Natural Remedies Research lab, Bangalore, Karnataka, India*

### ARTICLE INFO

#### Peer reviewer

Dr. Vinoth KM Khandelwal, Department of Translational Pharmacology, Postdoctoral researcher, Consorzio Mario Negri Sud, Santa Lusia Imbaro, Italy.  
E-mail: [Vinoth@negrisud.it](mailto:Vinoth@negrisud.it)

#### Comments

The study has been well planned and executed. The study provides evidence for the anti-ulcer activity of the ethanolic extract of *F. religiosa* leaf.

### ABSTRACT

**Objective:** To evaluate the anti-ulcer activity and acute toxicity of *Ficus religiosa* (*F. religiosa*) leaf ethanolic extract in animal models. **Methods:** Anti-ulcer activity of *F. religiosa* ethanolic extract (250 and 500 mg/kg body weight) was studied on stress induced ulcer animal models. Ranitidine was used as standard. The anti-ulcer activity of *F. religiosa* was evaluated with the help of ulcer area and histopathological examination. Preliminary phyto-chemical screening and acute toxicity studies of *F. religiosa* also carried out. **Results:** Results showed that the extract treatments prevented ulcer area and gastric secretion in a dose-dependent manner. Administration of 2000 mg/kg extract did not show any acute toxicity in albino mice. Preliminary phytochemical analysis identified the presence of flavonoids in the ethanolic extract of *F. religiosa*. **Conclusions:** The extract is non-toxic even at relatively high concentrations. The anti-ulcer activity is probably due to the presence of flavanoids.



ELSEVIER



Review

## Traditional uses, phytochemistry and pharmacology of *Ficus religiosa*: A review

Damanpreet Singh<sup>a</sup>, Bikram Singh<sup>b</sup>, Rajesh Kumar Goel<sup>a,\*</sup>

<sup>a</sup> Department of Pharmaceutical Sciences and Drug Research, Punjab University, Patiala- 147002, Punjab, India

<sup>b</sup> Natural Plant Products Division, Institute of Himalayan Bioresource Technology, Palampur-176061, Himachal Pradesh, India

### ARTICLE INFO

**Article history:**

Received 23 August 2010

Received in revised form 26 January 2011

Accepted 28 January 2011

Available online 3 February 2011

**Keywords:**

Ayurveda

*Ficus religiosa* L.

Phytochemistry

Sacred tree

Traditional use

Unani

### ABSTRACT

**Ethnopharmacological relevance:** *Ficus religiosa* L. (Moraceae) has been extensively used in traditional medicine for a wide range of ailments of the central nervous system, endocrine system, gastrointestinal tract, reproductive system, respiratory system and infectious disorders.

**Aim of the review:** To comprehend the fragmented information available on the botany, traditional uses, phytochemistry, pharmacology and toxicology of *F. religiosa* to explore its therapeutic potential and future research opportunities.

**Materials and methods:** All the available information on *F. religiosa* was collected via electronic search (using Pubmed, SciFinder, Scirus, Google Scholar, Agricola and Web of Science) and a library search.

**Results:** Ethnomedical uses of *F. religiosa* are recorded throughout South Asia, where it has been used for about 50 types of disorders. Phytochemical research had led to the isolation of phytosterols, amino acids, furanocoumarins, phenolic components, hydrocarbons, aliphatic alcohols, volatile components and few other classes of secondary metabolites from *F. religiosa*. Fresh plant materials, crude extracts and isolated components of *F. religiosa* showed a wide spectrum of *in vitro* and *in vivo* pharmacological activities like, antidiabetic, cognitive enhancer, wound healing, anticonvulsant, anti-inflammatory, analgesic, antimicrobial, antiviral, hypolipidemic, antioxidant, immunomodulatory, antiasthmatic, parasympathetic modulatory, estrogenic, antitumor, antiulcer, antianxiety, antihelmintic, endothelin receptor antagonistic, apoptosis inducer and hypotensive.

**Conclusions:** *F. religiosa* emerged as a good source of traditional medicine for the treatment of asthma, diabetes, diarrhea, epilepsy, gastric problems, inflammatory disorders, infectious disorders and sexual disorders. Although many of the experimental studies validated its traditional medicinal uses, but employed uncharacterized crude extracts. Thus, it is difficult to reproduce the results and pinpoint the bioactive metabolite. Hence, there is a need of phytochemical standardization and bioactivity-guided identification of bioactive metabolites. The results of few pharmacological studies and bioactive metabolites already reported in *F. religiosa* warrant detailed investigation for its potential against cancer, cardiovascular disorders, neuroinflammatory disorders, neuropsychiatric disorders, oxidative stress related disorders and parasitic infections. The outcome of these studies will further expand the existing therapeutic potential of *F. religiosa* and provide a convincing support to its future clinical use in modern