



Ficus carica: A Brief Review

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ABSTRACT

Nature is the best combinatorial chemist and perhaps has answers to most of the diseases of mankind. Failure of few synthetic drugs and its possible side effects are the reason for building interest in many of the researches to seek out help from the ancient healing methods, that mainly use herbal medicines to give relief. Today herbal remedies are back in repute. *Ficus carica*, also popularly known as common fig, its health management properties have been mentioned in religious books, it is one of the traditional Mediterranean species belonging to the family of Moraceae. Which is widely seen in the regions of sub-tropical and tropical countries. *In vitro* and *in vivo* studies has reported that figs fruits, leaves, stem, and latex have health management effect via antioxidant, anti-spasmodic, antimicrobial, anticarcinogenic and many more other effects.

Keywords: *Ficus carica*, Fig, edible fig, fig tree, anjir, common fig.

INTRODUCTION

F*icus carica*, the common fig is a deciduous shrub or small tree belonging to Moraceae or mulberry family. Fig is very common fruit crops grown in temperate regions throughout the world for its delicious fruits.¹ The genus *Ficus* is one of the largest genera of angiosperms in the tropical and sub-tropical regions all over the world having more than 800 species of trees, epiphytes, and shrubs.² The most significant species of *Ficus* that found in India are *F. bengalensis*, *F. carica*, *F. racemosa* and *F. elastica*. *Ficus carica* commonly is known as edible fig or anjir in hindi. Different parts like fruits, seeds, leaves, tender, bark, shoots and latex have many medicinal applications and its constituents have confirmed their role in diseases prevention and treatment.³ In this article, *Ficus carica* and its ingredients with diseases preventive ability has been discussed.⁴

Taxonomy⁵

Kingdom	: Plantae
Division	: Magnoliophyta
Class	: Magnoliopsida
Order	: Rosales
Family	: Moraceae
Genus	: <i>Ficus</i>
Species	: <i>Carica</i>

BOTANICAL DESCRIPTION

Tree of *F. Carica* L is generally tall as 15-20 ft that has numerous spreading branches and a trunk more than 7 ft in diameter. The latex of the plant is milky white and

mainly contains ficin, i.e., protein hydrolytic enzyme. The species name *carica* means having papaya-like leaves.⁶

Leaf

The leaves are bright green, single, alternate and large, usually up to 1 ft in length. They are rough hairy on the upper surface and soft hairy on the underside, deeply lobed with 1–5 sinuses. In receptacles the flowers are seen; arise from the axils of old leaves (Figure 1).²

Flower

The lower part of receptacle is occupied by male flowers and the upper part by female flowers. Saikonium, the ripen receptacle contains a large number of small whitish seeds.²

Seeds

Seeds may be minute, small, medium or large and range in number from 30 to 1600 per fruit. The seeds are edible, generally hollow, unless pollinated. The pollinated seeds provide the characteristic nutty taste to the dried figs. The interior portion is a white, inner ring containing a seed mass bound with jelly-like flesh.²

Fruit

Figs are axillary on leafy branchlets, paired or solitary, and usually pear shaped. The fruit (fig) and reproduction systems of species in the genus *Ficus* are exclusive. It can only be pollinated by their associated agaonid wasps (Hymenoptera: Chalcoidea: Agaonidae), and the wasps can only lay eggs within their associated fruit. Pollinator wasp must be present for successful pollination and reproduction of species of *F. Carica*. On the other hand, for successful reproduction of agaonid wasps to occur, their associated species of *F. Carica* must be present.⁷ Fruit skin



contributed most of the phytochemicals and antioxidant activity compared to that of fruit pulp (Figure 1 & 2).²

Root

The root system in the plant is typically shallow and spreading.² Sometimes covering 50 ft of the ground, but in the permeable soil some of the roots may descend upto 20ft.⁶

Bark

The bark is smooth. The outer bark is ash to silvery gray in color, along with exfoliated irregular rounded flakes. The middle bark section is brownish or light reddish brown in color in appearance. The inner part consists of the layers of light yellowish or orange brown colored granular tissue.²



Figure 1: *Ficus carica* fruits and leaves



Figure 2: *Ficus carica* dried fruit

Phytochemistry

The phytochemical investigation of *Ficus carica* was undertaken and has led to the identification of over 100 compounds, several coumarins were isolated from it. Multiple flavonoids have been identified from its, leaves, stem and roots. Some other constituents were triterpenoids from roots, leaves and the latex.⁸ Fruits constitute various valuable ingredients such as cyanidin-3-O-glucoside, cyanidin-3-Orhamnoglucoside, saturated fat, cholesterol, sodium, insoluble sugars, protein, vitamin A, vitamin C, calcium, iron.⁴ Dried seeds contain fixed oil that contains the fatty acids like, oleic acid, linoleic acid, linolenic acid, palmitic acid, stearic acid, arachidic acid.⁹ The other valuable ingredients are phenolics,

anthocyanins, fructose, glucose, and sucrose which were identified from the figs and the it has been also reported that fruit has phytosterols.⁴

Traditional and Current Uses

Ficus carica is one of the earliest fruit cultivated by the primitive man. Fighas been traditionally used for its medicinal benefits as cardiovascular, respiratory, metabolic, antispasmodic, and anti-inflammatory remedy.¹⁰ the juice of the fruit with honey was prescribed by checking haemorrhage (vrinda maadhavan). In unani medicine, anjir is used as laxative, diuretic and expectorant, also in the disease of the liver and spleen as a deobstruent and anti-inflammatory agent.¹¹.Fruits, leaves and roots of *F. Carica* are used in native medicinal system for different disorders such as gastrointestinal (colic, indigestion, loss of appetite, and diarrhea), respiratory (sore throats, cough, and bronchial problems), inflammatory, and cardiovascular disorders.¹⁰Fruit paste is applied to swellings, tumours, and inflammation to relive pain.^{12,10} Fig leaves are used medicinally for their diuretic, demulcent, emollient and antihelmintic properties. The fruit is valued for its laxative properties and is used in the treatment of skin infection. They are used as a galactagogue and tonic and as a poultice in the treatment of gumboils, tumors, dental abscesses, and other abnormal growths.⁸

PHARMACOLOGICAL ACTIVITES

1. Antipyretic effect

Commonly used antipyretic drugs are toxic to liver cells and cause complications. The antipyretic effect of ethanol extract of leaves was evaluated and extracted at doses of 100, 200, and 300 mg/kg body wt. that showed significant dose-dependent reduction in normal body temperature and yeast-provoked elevated temperature.¹³

2. Antidiabetic activity

Experiment-based studies on *F. Carica* and its extract has shown to have antidiabetic activity. Antidiabetic effect of methanolic extract of stem bark was carried out and findings confirmed that extract showed significant protection and lowered the blood glucose levels to normal.¹⁴ Another study was performed to evaluate the hypoglycemic effect of an aqueous extract of leaves. Results of the study pointed that extract has a clear hypoglycemic activity in treated versus non-treated diabetic rats.¹⁵

3. Antispasmodic activity

Ficus carica was studied for antispasmodic effect on the isolated rabbit jejunum preparations as well as for antiplatelet effect by ex vivo model of human platelets. The study revealed presence of spasmolytic activity in the ripe dried fruit of *Ficus carica* along with antiplatelet activity which provided pharmacological basis to be used in the gut motility and inflammatory disorders.¹⁶

4. Anti-cancer activity

F. carica shows role as antitumor through inhibitory effects on the proliferation of various cancer cell lines. A study was carried out in order to check the anticancer effect of latex in different concentration and the results displayed that 5 mg/ml concentration had the greatest effect in inhibition of cancer cell line growth in stomach. Other study reported that latex and its derivatives have been showed to suppress the growth of spontaneous and tumors. Cytotoxicity of fruit and leaf extracts as well as the latex on HeLa cell line were examined and results showed that latex and different extracts could reduce the viability of HeLa cells at concentrations as low as 2 µg/mL in a dose-dependent manner.⁴

5. Antioxidant Activity

The *F. Carica* leaf extract was evaluated for a-tocopherol content, total flavonoid and total phenol content and was investigated for antioxidant capacities. The results visibly confirmed that these extracts have antioxidant capacity, which are consistent with total phenol and flavonoid contents. In another study, fruits of different varieties of fig were analyzed for polyphenols and anthocyanins contents. It was then found out that dark-coloured mission variety contained the highest levels of polyphenols, flavonoids and anthocyanins than red brown-Turkey variety, exhibiting the highest amount of antioxidant capacity which is correlated well with the amounts of polyphenols and anthocyanin.⁸

6. Hypocholesterolaemic activity

The administration of aqueous decoction of fig leaves to streptozotocin induced diabetic rats caused reduction in the levels of total cholesterol as well as decrease in the total cholesterol/HDL ratio compared to the control, along with decreased of the hyperglycaemia.⁹

7. Anthelmintic activity

The methanolic extract of the Fig was screened to evaluate the nematicidal activity against *Bursaphelenchus xylophilus*, *Panagrellus redivivus*, and *Caenorhabditis elegans* nematodes. Outcome of the study confirmed that leaf extract has the strongest nematicidal activity causing 74.3%, 96.2%, and 98.4% mortality, respectively.¹⁷

In another study, anthelmintic activity of the latex were examined and results confirmed that administration in doses of 3 ml/kg/day was capable in the removal of *Syphacia obvelata* (41.7%).¹⁸

8. Irritant Potential

Isolated triterpenoids extracted from the leaves of fig were tested for irritant activity. The in vivo studies showed that the compounds calotropenylacetate, methylmaslinate, and lupeol acetate are the most potent and most persistent irritant.¹⁶

9. Anti-acne activity

Anti-acne activity was evaluated against *Propionibacterium acnes* using agar disc diffusion method and the minimum inhibitory concentration was calculated by using serial tube dilution method.¹⁹

10. Effect on osteoclastogenesis

Another study result showed that hexane soluble fraction of the *Ficus carica* is a potent inhibitor of osteoclastogenesis in RANKL-stimulated RAW264.7 cells and in the bone marrow-derived macrophages.²⁰

CONCLUSION

Fig is a deciduous tree having wide-range of disease-management activities as it is a rich source of antioxidants. Traditionally as well as scientifically various experiments it has been confirmed that fig has potential role in diseases cure. From this review it can be concluded that, *F. Carica* has many beneficial biological activities, these facts can be established clinically by further studies.

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