

**A REVIEW: ANTI DIABETIC FIG**

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**ABSTRACT**

Millions of individuals throughout the world suffer with diabetes, a chronic lifestyle illness. Diabetes is a condition when either insufficient or ineffective insulin production occurs in the body. The pancreatic beta-cells produce more insulin as a result of insulin resistance in conditions like diabetes or obesity. There are several types of diabetes, including type 1, type 2, type 3, and gestational. 90–95% of people with diabetes have type 2, which is characterised by both decreased insulin synthesis by the pancreatic beta cells and impaired insulin release in response to high blood glucose levels. The fig was prized both as a meal and for its medicinal qualities. For their functional features as well as their technological capability as a dietary supplement, a wide variety of biologically active chemicals, including as carotenoids, flavonoids, phenols, and vitamin C, are required. These compounds are also responsible for the majority of health effects. Due to their diverse and rich chemical makeup, biologically active compounds have a variety of biological properties. These properties include antioxidant, anti-inflammatory, antidiabetic, antimicrobial, and hepatoprotective activity. This suggests that bioactive substances may be used to develop new foods and medications. The fig fruit should be universally acknowledged as a healthy, useful food. The idea of growing fig species as a practical and novel component for its numerous food and nonfood applications as a remarkable and basic source of medication and sustenance is presented by this systematic and thorough review. The anti-diabetic qualities of fig. are the subject of this essay. It discusses an effort to include the aforementioned value in the creation of anti-diabetic tea.

**INTRODUCTION****Diabetes**

One of the prevalent metabolic conditions, diabetes mellitus causes significant morbidity and mortality due to micro- and macrovascular problems. It is one of the top five killers in the globe, according to experts. There is currently no adequate, effective treatment for diabetes mellitus accessible in modern medicine. Due to the negative effects of using insulin and oral hypoglycemic medications, patients are increasingly asking to utilise natural items with antidiabetic efficacy. Although many conventional medicines are said to have hypoglycemic characteristics, these are less efficient in decreasing blood sugar levels in those with severe diabetes.

Hyperglycaemia, a metabolic disease brought on by increased hepatic glucose synthesis, decreased insulin secretion, and impaired insulin action, characterises diabetes mellitus. Despite the fact that diabetes is a worldwide issue, the current study intends to open up a new path for investigating the antidiabetic activity of various medicinal plants on a sound scientific basis and different commercial formulations that offer value as novel antidiabetic drugs.

**Types of diabetes mellitus**

Lack of insulin is the underlying cause of type 1 diabetes mellitus. Type I diabetes requires the administration of insulin, which must be injected or inhaled.

Insulin resistance in cells is the underlying cause of type 2 diabetes mellitus.

The therapies comprise: -

1. Substances that cause the pancreas to release more insulin.
2. Substances that make target organs more sensitive to insulin,
3. Substances that slow down the pace at which the gastrointestinal system absorbs glucose.

Because there are insufficient beta cells, type I diabetes (insulin dependent) is brought on by inadequate insulin production. In contrast to Type II diabetes patients, who are insulin independent and can be managed with dietary modifications, exercise, and medication, people with this condition are completely dependent on exogenous sources of insulin. 90% of people with diabetes have type II diabetes, which is the more prevalent type.

**FIG**

The fig is an edible fruit that grows on a little tree called

*Ficus carica*, which is a member of the Moraceae family of flowering plants and is indigenous to the Mediterranean region as well as western and southern Asia.

Figs have a number of pharmacological qualities and have long been utilised in traditional medicine.

Flavonoids, polyphenols, and carotenoids are a few bioactive substances found in figs that have been demonstrated to have antioxidant, anti-inflammatory, and anti-diabetic activities. These elements make figs potentially beneficial for treating chronic illnesses like diabetes, cancer, and heart disease by lowering oxidative stress, inflammatory markers, and blood sugar levels.

Figs offer potential antibacterial effects in addition to antioxidant and anti-inflammatory ones. It has been demonstrated that fig latex has antibacterial activity against a variety of bacteria and fungi.

The enzymes ficin and bromelain, which have been demonstrated to have anti-inflammatory qualities and can aid in better digestion, are also found in figs. These enzymes have the ability to breakdown proteins, which can lessen inflammation and enhance nutritional absorption.

### Properties

*F. carica* has been found to carry out a variety of intriguing biological processes that can be further investigated in order to utilise them as a treatment approach in the future. For instance, the leaves exhibit irritating properties; as a result, they can be researched for parasite infection and ovicidal properties. The majority of pharmacological research on *F. carica* has used unrefined crude extracts, making it challenging to produce the grades of these investigations and pinpoint the bioactive compounds.

Research on *F. carica*'s phytochemistry has resulted in the isolation of a few types of plant metabolites. The majority of *F. carica*'s phytochemical research has focused on its leaves and fruits, while little is known about the phenolic profiles of its stem and roots. However, *F. carica*'s extensive traditional use and well-established pharmacological actions highlight the immense potential for its phytochemical investigation through bioassay-guided isolation. Future study in the aforementioned fields will provide a convincing argument in favour of the clinical applications of *F. carica* in modern medicine.

### Biological activities

#### 1. Antioxidant activity

Many phenolic compounds found in *F. carica* are involved in a variety of physiological processes in plants. Some of them are advantageous to human health as well since they can function as antioxidants in a variety of ways, including as reducing agents, hydrogen donors,

free radical scavengers, singlet oxygen quenchers, and so on. Fig fruits of *F. carica* were examined for total polyphenols, total flavonoids, antioxidant capacity, and anthocyanin profile using six commercial fig cultivars in varied colours (black, red, yellow, and green). The ferric reducing antioxidant technique was used to determine the antioxidant properties. The highest concentrations of polyphenols, flavonoids, and anthocyanins, as well as the highest antioxidant capacity, were found in fruits.<sup>[31]</sup> Total flavonoids, antioxidant power, and anthocyanin profile of *F. carica* fig fruits were all examined.

#### 2. Hypoglycemic activity

In streptozotocin-diabetic rats, the leaf extract produced a substantial hypoglycemic effect after oral or intraperitoneal injection. In diabetic rats receiving treatment, weight loss was stopped, and plasma insulin levels significantly changed the survival index. According to the findings, *F. carica*'s aqueous extract clearly displays hypoglycemic effects.

#### 3. Hepatoprotective activity

On rats given 50 mg/kg of rifampicin orally, the petroleum ether extract from the leaves of *F. carica* was tested for its potential to protect the liver, and it significantly reversed the biochemical, histological, and functional changes that the drug had caused in the rats.

#### 4. Hypolipidemic activity

To control TG and TC secretion in chicken liver, a supplement containing *F. carica* leaf extract might be helpful. The liver of an eight-week-old rooster with a high belly fat content was removed, thinly sliced, and cultured with progressively higher doses of leaf extract, insulin, and a combination of the two.

#### 5. Anti cancer activity

From fig (*F. carica*) latex, an assortment of 6-O-acyl-d-glucosyl- sitosterols has been identified as a powerful cytotoxic drug that inhibited the proliferation of several cancer cell lines in vitro.

#### 6. Anti -Bacterial And Anti -Fungal Activities

The methanol extract of *F. carica* demonstrated significant antibacterial action against oral bacteria (MICs, 0.156 to 5 mg/mL; MBCs, 0.313 to 5 mg/mL). Methanol extract's synergistic actions with ampicillin or gentamicin against oral bacteria shown that figs could function as a natural antibacterial agent.<sup>[46]</sup> Using the disc-diffusion method, the antibacterial properties of *F. carica* latex extracts against five different bacterial species and seven different fungus strains were examined in vitro. The methanol fraction's minimal inhibitory concentration (MIC) demonstrated complete inhibition of *Candida albicans* (100%) at a concentration of 500 g/mL and a detrimental effect on *Cryptococcus neoformans*; methanolic extract (75%) strongly inhibited *Microsporum canis*, and ethyl acetate extract at a concentration of 450 g/mL inhibited *Cryptococcus neoformans*.

### 7. Antipyretic activity

At dosages of 100, 200, and 300 mg/kg, the ethanol extract of *F. carica* demonstrated a significant dose-dependent drop in normal body temperature, while yeast induced an increase in temperature. When compared to the action of the usual antipyretic medicine, paracetamol (150 mg/kg.b.wt., p.o.), the effect lasted up to five hours.

### 8. Antituberculosis activity

Using a colorimetric microplate-based assay, the 80% methanol extract from the leaves of *F. carica* was tested for its ability to inhibit *Mycobacterium TB H37Rv*. A MIC value of 1600 g/mL showed anti-tuberculosis action in the results.

### 9. Irritant potential

The ability of the *F. carica* leaves' separated triterpenoids and methanol extract to cause irritation was examined. Calotropenyl acetate, methyl maslinate, and lupeol acetate were the most strong and importunate irritants, with irritation potential on mouse ears that was close to that of psoralen and less than that of euphorbium. By using an open mouse ear experiment, irritant potential was assessed.

### 10. Nematicidal activity

For its nematicidal action against the nematodes *Bursaphelenchus xylophilus*, *Panagrellus redivivus*, and *Caenorhabditis elegans*, forty different plant species were tested. The highest nematicidal activity was demonstrated by the leaf extract of *F. carica*, which resulted in 72-hour mortality rates of 74.3, 96.2, and 98.4%, respectively.

### 11. Antispasmodic and Antiplatelet activity

The antiplatelet activity of the *F. carica* aqueous-ethanolic extract on rabbits and an *ex vivo* model of human platelets were both studied. For alkaloids, flavonoids, coumarins, saponins, sterols, and terpenes, *F. carica* tested positive. It also tested positive when it was tested in isolated rabbit jejunum.

### CONCLUSION

Due to their possible health advantages, figs can be a useful component in tea recipes. In addition to adding sweetness and flavour to tea, figs may also have health advantages. Making fig and cinnamon tea is one well-liked technique to incorporate figs into tea. This tea blends cinnamon's anti-diabetic effects with the antioxidant and anti-inflammatory qualities of figs to produce a pleasant and perhaps beneficial beverage. Simply simmer water with chopped figs and cinnamon sticks for a few minutes, filter, and drink the tea.

Making fig and ginger tea is another way to use figs in tea. Ginger has been demonstrated to have both digestive and anti-inflammatory effects, which can work in conjunction with figs' natural digestive and anti-inflammatory qualities. Simply soak ginger and chopped

figs in boiling water for a few minutes, drain, and enjoy delicious tea.

Herbal teas can be a beneficial supplement to a balanced diet, but they shouldn't be taken in place of medical care, it's crucial to remember that. Before adopting any dietary or treatment changes, people with diabetes or other medical disorders should always speak with their doctor.

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