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Ethnobotanical and pharmacological uses of fig

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Abstract---*Ficus carica*, often referred to as *Anjir* in India, is a middle-sized laticiferous deciduous tree and is widely cultivated in all tropical and subtropical nations. It's fruit is extremely sweet with several crunchy seeds present in it. It are often consumed as fresh or dried. It's also referred to as the nature's candy because it has dense natural sugar present in it. Figs have many traditional uses further as many benefit for our health. It's rich in potassium, manganese, vitamin B6, copper, vitamin B and plenty of fiber. This paper describes the ethnobotanical properties of fig and therefore the pharmacological uses associated with digestive, reproductive system and lots of more. It also helps in the treatment of digestive tract infection. The phytoconstituents psoralens, bergapten, xanthotoxin, xanthotoxol, and marmesin have also been isolated from leaves, in addition to umbelliferone and scopoletin, and peptides have been extracted from latex. Fruit extracts had anticarcinogenic, anthelmintic, and action against anaemia (due to ficin). The plant's traditional uses include purgative, aphrodisiac, anti-inflammatory, expectorant, diuretic, and anxiety-relieving (mild sedative). In order to provide a thorough evaluation of the literature on its ethnobotanical and pharmacological uses, the present review was created.

Keywords---*Angir,* benefits, common fig, medicinal properties, uses.

Introduction

Ficus carica generally called fig, is a tree belonging to family Moraceae (Abo-El-Ez et al., 2013; Idrus et al., 2018) . The fig is native from the center east to the Western Asia. The fig plant is cultivated in warm climate. It's extensively used as fresh or dried fruit and also called have-not food. The fruit also contain the abundant amount of iron, calcium, phosphorus and potassium. The fresh figs are sensitive to physical damage and liable to post harvesting decay infection. Fig tree could be a temperate species also native to Southwest Asia and it's also been widely cultivated since thousands of years for its fruits (Sastri, 1950). This plant is additionally employed by the researchers worldwide for its biological activities.

Fig tree has been indicated with in the traditional system of drugs like Ayurveda, Unani and Siddha. Figs and its leaves are utilized in processed form to supply different traditional and industrial products like jams, wines etc. (Botti et al., 2003). The fig is harvest worldwide for its dry and fresh fruit. The edible part of it is fleshy and receptacle. The fresh and dried fig also contain very huge amount of fiber and polyphenols. Fig is additionally a decent source of phenolic compounds that are pro anthocyanidins and whereas wine and tea also are good source of phenolic compounds which contain phenols but under the fig (Bolay, 1979). The fruit fig is frequently included in seasonal salads together with apples, almonds, and other fruits and nuts. This fruit is used all around the world to treat a variety of medical conditions, including cancer, anaemia, diabetes, ulcers, paralysis, inflammation, and more. Fig leaves and fruit have undergone extensive phytochemical analysis, which has demonstrated that they are rich in organic acids, phenolic, and volatile chemicals.

Botanical description

Ficus carica is typically of 15 to 20 feet tall decidious tree with numerous spreading branches. The diameter of trunk is about 7 feet long (Rahmani & Aldebasi, 2017). It is a monoecious species. The plant latex is milky white and contains ficin protein. Fig tree can be a gynodioecious, deciduous tree or large shrub and with smooth bark. The full fruit is 3-5 centimeter long with the green skin that sometimes ripened towards purples or brown. The milky sap found in figs is created by laticifer cells. Human skin is irritated by the sap of the green portion. White latex is released when the fig plant's leaves and stems are broken. When figs are born singly or in pairs, they are referred to as syconia. The inflorescence structure encloses the male and female components. Because of the fruit, female flowers are considered. On the same plant, both sexes can be present. Unusable figs were produced by the Caprifig tree. It has male flowers at the apex as well as short-styled female flowers that are tailored to the fig wasp that lays eggs in them. The edible and inedible figs are both pollinated by Capri fig pollen, which is carried by the fig wasp.The plant itself fertile suitable for light, prefers well drained soil and may grow in heavy clay and nutritionally poor soil. Don't be it should be acidic and basic soil. It's incapable to grow within the shade. It prefers damp or dry soil and can condone drought. The leaves of the fig are 3-7 lobed, thick and maybe up to 20 centimeter long. The petiole of Ficus is long and stands from the base of leaf. The leaf margins are toothed (Morton, 1987).

The Flowers are tiny and unnoticeable. Three times a year, the fig blossoms. Since all flowers are female, pollination is not necessary. The fig's wall is whitish, more or less pink or yellow, and the skin is delicate or thin. Unripe fruit has gummy latex, while ripe fruit is juicy and sweet (Wang et al., 2008). Seeds may vary in size to large, medium, small or minute. The bark of the tree is smooth. The outer bark of the common fig tree is silvery Gray or ashen, exfoliated with asymmetrical rounded flakes. The center bark section is brownish or light. Brown in color. The inner part is of sunshine yellowish color with granular tissue (Badgujar et al., 2014). The shape of fig fruit is ovoid, turbinate, pear- shaped. It's 1-4 inch long and varies in color from yellowish- green to coppery, bronze or dark- purple. The unique feature of fig is that they have a gap called 'eye' or "ostiole". This isn't

connected with the tree, but it helps within the development of fruit and it also helps it to create a contact with the external environment (Badgujar et al., 2014).

Nutritional Value of Fig

Figs are mostly water, with a small amount of protein, 19% carbs, and 1% fat. They provide a moderate amount of dietary fibre per 100 gram serving (14% of the Daily Value, DV) (74 calories). Figs contain a 64% carbohydrate content, a 3% protein content, and a 1% fat content when dehydrated to 30% water. Dried figs are a high source of dietary fibre (more than 20% DV) and manganese, an important mineral, in a 100-gram portion that has 249 calories. They also include modest levels of calcium, iron, magnesium, potassium, and vitamin K (Nuri & Uddin, 2020).

Ethnobotanical Uses

- **It helps in preventing post-menopausal carcinoma.**
  The fruit is rich in fiber, therein that is good to stop carcinoma. One serving of fig can provide up to five grams of fiber that a girl have to consume on a daily basis. In turn it extremely slow downs the danger of carcinoma (Nuri & Uddin, 2020).
- **Better for skin** (Bolay, 1979)
  Fruit and stem latex are helpful in treatment of skin disorders. As fig rich in Vitamin B complex, antioxidant and various minerals that are very beneficial for skin. The anti-oxidants that are present in it helps to rejuvenates your skin and keep it free from various skin disorders.
- **Helps in reducing weight**
  The high fiber content which is present in fig is good for weight management (Vinson, 1999)
- **Benefits for hairs**
  The vitamin E present in fig may be a great source for the expansion of length and volume of hairs. The calcium is also a precursor of collagen that constitutes the hair. Besides eating fig. fig oil can also be applied for good health of the hairs (Lee et al., 2012).
- **It prevents constipation**
  Dried fig is one amongst the simplest fruit to appease the intestine. It's loaded with good amount of soluble fibre and act as a natural laxative. Anjeer rich in fiber content can promote an honest bowel movement and is a natural treatment for digestive disorders. Syrup of fig is used as a remedy for treatment of constipation (Khare, 2008)
- **Stronger bones et al.,** (Khan et al., 2011; Sadia et al., 2014)
  As is common knowledge, figs are loaded with vitamins, minerals, calcium, and phosphorus, all of which are essential for strengthening bones and lowering the risk of osteoporosis. Additionally, it encourages bone production and stimulates bone renewal (Soni et al., 2014).
- **Dental health**
  The presence of phenolic compounds, flavonoids and phytochemicals present in Anjeer exhibit anti-bacterial activities which reduce bacterial infection, protect gums, teeth and promote overall dental health (Shafique et al., 2021).

Pharmacological Uses
Antioxidant Activity

Dried fruits of *Ficus carica* have been shown to have a substantial antioxidant activity (Feng & Ma, 2010; Prabavathy & Nachiyar, 2011; Vinson, 1999). Numerous phenolic compounds found in *Ficus carica* are involved in numerous physiological processes in plants. Many of them are good for human health because they can function as antioxidants in a variety of ways, including reducing agents, hydrogen donors, and free radical adventures. The fig fruit of the common fig tree was examined in terms of total polyphenols, total flavonoids, antioxidant capacity, and anthocyanin profile using six commercial fig kinds with different colours (black, red, yellow, and green) (Konyaloglu et al., 2005). The ferric reducing antioxidant technique was used to determine the antioxidant properties. The highest concentration of polyphenols, flavonoids, and anthocyanins, as well as the highest antioxidant capacity, were found in fruits. The antioxidant strength of fig leaf extracts was researched by Konyaloglu et al. in 2005.

Cancer prevention

Numerous 6-O-acyl-d-glucosyl-sitosterols were isolated from fig latex. In comparison to linoleyl, stearyl, and oleyl derivatives, the palmitoyl derivative of AGS works as the most powerful inhibitor for a variety of neoplastic cell lines. In vitro suppression of the neoolastic cell lines DG-75, Jurkat, and DU-145 by AGS has been documented. AGS is the most effective anticancer agent as a result (Rubnov et al., 2001).

Cytotoxicity

HeLa cell lines were used to test the cytotoxicity of *Ficus carica* latex, fruit, and leaf extract. At lower quantities, plant latex and other extracts may impair the viability of HeLa cell lines. The IC50 values for the ethanol, ester, and dichloromethane extracts of the leaves and fruits are around 10, 13, 12, and 12, 12, 11.5 g/ml and 17 g/ml, respectively. As a result, fig cytotoxicity may also be attributed to its active components (Khodarahmi et al., 2011).

Hypolipidimic activity

Asadi and colleagues extend the hypolipidimic research using an animal model. The hepatic TG (triglyceride) concentration and the liver's production of TG and cholesterol were both said to be decreased by the tree leaves. Additionally, with a little increase in the FTE dose, the hepatic TG content and TG secretion values from the liver considerably decreased. This finding shows that the leaf extract may be an advantageous liver complement (Asadi et al., 2006).

Antipyretic

In a study, the common fig tree's ethanol extract was shown to have a strong antipyretic effect by successfully lowering body temperature at doses of 100, 200, and 300 mg/kg. Additionally, compared to paracetamol (150 mg/kg), a common

antipyretic medication, the impact persisted for up to 5 hours following drug delivery (Nuri & Uddin, 2020).

Helminthicide (Amol et al., 2010)

According to the WHO, only a few medications are routinely used to treat helminthes in people as a whole. Natural antihelmintics may be quite important in the management of parasite infestations. Comparing the antihelmintic activity of aqueous, petroleum ether, chloroform, and methanol extracts of common fig tree leaves to that of the standard medication mebendazole (Nuri & Uddin, 2020). Additionally, reports of this kind of behaviour have been made for a number of Ficus species, including Ficus benghalensis Linn (Chandrashekhar et al., 2008).

Antiplatelet and antispasmodic

The antispasmodic activity of the aqueous ethanol extract of fig tree fruit was investigated on rabbit jejunum preparations, as well as the anti-plated action utilising an ex vivo model of human platelets. When AEE was tried in the jejunum of a rabbit, it spontaneously caused relaxation. AEE also prevents human platelet aggregation brought on by adenosine 5'-diphosphate and adernaline (Gilani et al., 2008).

Pain relievers (Duke, 2002)

For anti-inflammatory action against carrageenan-induced rat paw, petroleum ether, chloroform, and ethanol extract of fig tree leaves have been reported. Compared to Fig tree PEE and CE, the EE has a stronger anti-inflammatory activity (Gond & Khadabadi, 2008; Patil & Patil, 2011). For rat models of CCL4-induced liver injury, the hepatoprotective potential of a methanol extract of fig tree leaves was investigated. Lower levels of aspartate aminotransferase, alanine aminotransferase, and total serum bilirubin, three markers of liver lipid peroxidation, in the serum indicated that the extract had a significant protective impact (Mohan et al., 2007). Additionally, considerable hepatoprotective efficacy against carbon tetrachloride- and paracetamol-induced hepatoxicity in rats was discovered for the leaf extract of Ficus racemosa Linn.

Low blood sugar (El-Shobaki et al., 2010)

In streptozotocin-induced diabetic rats, weight loss was inhibited, demonstrating the hypoglycemic effect of an aqueous extract of leaves (Perez et al., 1996). Furthermore, the medication led to an increase in the survival index, which was associated with higher plasma insulin levels.

Antiviral

The antiviral and cytotoxic effects of five fig tree extracts, including methanol, hexanic, ester, hexane-ethyl acetate, and chloroform, were examined. By examining cytopathic effect against herpes simplex type 1 (HSV-1), echovirus type 11 (ECV-11), and adenovirus, in vitro antiviral potential activity was investigated (ADV). At a concentration of 78 g/ml, the hexanic and hexane-ethyl acetate

extracts prevented the growth of viruses. The most potent possibilities for herbal medications used in the treatment of viral infectious disorders such animal viruses, echoviruses, and adenoviruses are these two extracts. Aref and colleagues came to the conclusion that antiviral and cytotoxic activities were not connected (Aref et al., 2011).

Lower cholesterol activity

Fig leaves contain hypocholesterolemic properties. The aqueous decoction of fig leaves can now be used to make chloroform extract. It results in a decrease in total cholesterol levels, a reduction in the total cholesterol/HDL cholesterol ratio, and a reduction in hyperglycemia. Additionally to the present, the drop in blood cholesterol levels in streptozocin-induced diabetic rats is appreciated by the cholesterol content of HepG2 cells (Canal et al., 2000).

Scavenging for free radicals

The method was developed by Yang et al. in 2009 to investigate the total flavonoids extracted with the use of ultrasound from the fig tree's fruit and their capacity to scavenge free radicals. So, fig performs an important function of scavenging free radicals (Yang et al., 2009).

Potential irritant

Five newly discovered tripterpenoids from the fig tree, including bauerenol, calotropenyl acetate, lupeol acetate, methyl maslinate, and oleanolic acid, were tested for their potential to irritate using a mouse open ear assay method. The total methanol extract, methyl maslinate, calotropenyl acetate and lupeol acetate showed noticable and protracted irritating effects as compared to other triterpenoids of fig tree (Saeed & Sabir, 2002).

Immunostimulant

The immunomodulatory effects of the ethanol extract of fig tree leaves were investigated in mice. This examination was carried out using a variety of haematological and serological techniques. After extract administration, there was a discernible improvement in the cellular and humoral antibody responses. The ethanol extract of fig tree leaves therefore has the potential to operate as an immunostimulant (Patil & Patil, 2011).

Microbiological activities

Prevotella intermedia, Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Streptococcus gordonii, Streptococcus anginosus, and Aggregatibacter actinomycetemcomitans were all targets of the fig tree leaf methanol extract's potent antibacterial activity (MIC, 0.156-0.625 mg/ml; MBC, 0.313-0.6 In order to treat harmful bacteria in oral fissures, figs can be utilised in oral care recipes as a natural antibacterial agent (Jeong et al., 2009).

Effect on indigestion

One of the most prevalent gastrointestinal problems worldwide is constipation. The effectiveness of fig paste in treating loperamide-induced constipation in a rat model was investigated in this study. Animals were split into four experimental groups and one normal control group for this reason. Within the four experimental groups, loperamide was intraperitoneally injected to cause constipation. To evaluate the anticonstipation properties of fig paste, it was given for four weeks. When rats were fed the fig fruit, the incidence of constipation was reduced (Lee et al., 2012). Additionally, fig fruit supplementation relieved symptoms in patients with functional constipation, according to a clinical investigation (Kim et al., 2010). This randomised controlled research of 20 female patients with functional constipation showed that fig fruit supplementation increased the amount of faeces, decreased the length of time needed to fecate, and reduced the discomfort. Therefore, taking fig supplements may be a beneficial therapeutic and preventative measure for persistent constipation.

Antimutagenic

Research has been conducted on the antimutagenic effects of fig tree, cereal grass, and herbaceous plant extracts on environmental xenobiotics. The plant extracts demonstrates the ability to reduce the genotoxicity of environmental mutagens (Agabeli & Kasimova, 2005).

Antimicrobial and antifungal properties

The oral bacteria were effectively combated by the methanol extract of *Ficus carica*. It was demonstrated that figs could function as a natural antibacterial agent by the synergistic effects of mixing methanol extract with ampicillin or gentamicin against oral bacteria. Using the disc- diffusion method, the ester, hexane, methanol, and chloroform extract of common fig tree latex were examined for antibacterial activities in vitro against five bacterial species and seven strains of fungi. The antibacterial and antifungal activity against two gram positive bacteria, two gram negative bacteria, and two fungus species was examined using various *Ficus carica* plant sections (Shafique et al., 2021).

Activity against tuberculosis

A colorimetric microplate-based assay was used to test the 80 percent methanol extract from common fig tree leaves for the presence of Mycobacterium tuberculosis. With a MIC value of 1600 g/mL, the results showed anti-tuberculosis activity (Badgujar et al., 2014).

Numecidal Activity

For its nematicidal action against the nematodes Bursaphelenchus xylophilus, Panagrellus redivivus, and caenorhabditis elegans, forty different plant species were tested. The fig leaf displayed the most pronounced nematicidal activity (Liu et al., 2011).

Conclusion

The common fig tree has been involved in a variety of fascinating biological processes that can be further investigated in order to employ them as a treatment option in the future. For instance, the leaves exhibit irritating properties; as a result, they can be researched for parasite infection and ovicidal properties. The researches can further be refined on these lines because the bulk of pharmacological experiments on the common fig tree were conducted with uncharacterized crude extracts. The parts of the fig tree that are consumed as nutritional supplements contain the vital amino acids tryptophan, phenylalanine, lysine, and histidine, as well as the vitamins A, C, thiamine, riboflavin, and niacin, dietary fibre, minerals including salt, potassium, and calcium, and carbohydrates. Therefore, it might be examined for a variety of common body functions and growth.

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