

Medicinal plants of The Holy *Quran* -I Teen (*Ficus carica* L.)

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Abstract

The creator of this universe has created millions of organisms upon this crust of earth, which are being exploited by human beings since their origin. In the Holy *Quran*, the divine treatise, a number of items have been mentioned which are for the benefit of human race including sizeable number of plants which are extremely beneficial for us in general and therapeutics in particular. One such plant species is *Ficus carica* L., commonly called as Fig or *Anjeer*. Its Arabic name is *Teen*. Researchers have found that, not only the fruits of this plant are extremely useful in the treatment of various ailments, other parts are also efficacious in controlling several diseases. Apart from other therapeutic uses, the fig is being used as purgative, aphrodisiac, antiinflammatory, diuretic expectorant, antianxiety agent etc. The present paper deals with various medicinal uses, phytochemistry and pharmacological trials carried out by various workers on this plant.

As said earlier, The Holy *Quran* mentions a number of bounties which the creator has bestowed on us, to be utilized for our betterment. It is planned to bring out a detailed account of such plants in a series of publications. The first one is focused on Fig (*Ficus carica* L.), *Teen* in Arabic.

Vernacular names of fig (*F. carica*) :

Arabic (*Teen*); Bengali (*Dumur*); English (*Fig*); Greek (*Feige*); Hindi, Marathi, Punjabi and Urdu (*Anjeer*); Kannad (*Anjura*); Kashmiri (*Anjur*); Malyalam (*Peralle*); Persian (*Anjir*); Tamil (*Attit Pazham*); Telugu (*Athi Pallu, Anjoru*); Sanskrit (*Kakudumberika*);

The genus *Ficus*, comprises of over 800 species in the family Moraceae. (Chawla *et al.*, 2012). Apart from *Ficus carica*, other notable species are *F. benjamina*, *F. religiosa*, *F. bengalensis* and *F. elastica*. *F. religiosa* has religious significance and is worshipped by the believers of Hinduism and *F. bengalensis* by Buddhists. But the most important *Ficus* species

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associated to human civilization is *F. carica*, which has been utilized as a source of nutrition and importantly as a medicine in the treatment of various ailments as shall be clear from the works of several researchers in the field of therapeutics.

In the Holy *Quran*, Allah swears in the name of fig and thus says, 'By the fig and the olive and the Mount of Sinai, and this city of Security (Mecca), we have indeed created man in best moulds (surah *Teen*, The Fig verse or *Teen* 1-4). Farooqui (1989), brought out a book on, 'The Plants of Quran' followed by 'Medicinal Plants in the Traditions of Prophet Muhammad (PBH)' in 1998. The third edition appeared in 2004. These publications present deep insight of the Quranic plants and Traditions of Prophet Muhammad (PBH).

Traditions on fig :

- o The prophet Muhammad (PBH) said, if you are going to say that any fruit has come from the Garden (Heaven) then truly you should mention fig (Tradition Teen), for it is indeed the fruit of garden (Heaven) (Narrated by Abu Darda; Suyuti)
- o Apostle of Allah said, 'Eat fig. It helps in piles and also useful in gout. (Narrated by Abu Dhar Ghaffari; Abu Nu'aim)

In the lines to follow, various aspects of *Ficus carica* have been highlighted.

Botanical diagnosis : Fig or *Carica papaya* is a gynodioecious (functionally dioecious) deciduous tree or large shrub, growing to a height of 7-10 metres. Leaves are 12-24 cm. long and 10-18 cm. broad, and deeply lobed with 3-5 lobes. The inflorescence is complex and consists of a hollow fleshy structure called the syconium, which is lined with numerous unisexual flowers inside. The flower itself is not visible from outside the

syconium, as it blooms inside the inflorescence (Hypanthodium). Although commonly referred to as a fruit, the fig. is actually the infructescence or scion of the tree, known as a false fruit or multiple fruit, in which flowers and seeds are borne. It is a hollow ended stem containing many flowers. The small orifice (ostiole) visible on the middle of the fruit is a narrow passage, which allows the specialized fig wasp, *Blastophaga psenes* to enter the fruit and pollinate the flowers, whereafter the fruit grows seeds.

The edible fruit consists of the mature syconium containing numerous one seeded fruits (drupelets). The mature fruit is 3-5 cm long, with a green skin, sometimes further ripening towards purple or brown. The plant as well as young fruits have a milky sap or latex which is irritant to human skin.

Habitat : A perusal of literature reveals that the common fig tree has been cultivated since ancient times in various parts of the world. It also grows wild in dry and sunny areas, with deep and fresh soil, also in rocky areas from sea level to an altitude of 1700 metres. However, it prefers light and medium soils, requires a good drainage and can also grow in nutritionally poor soils. Like all fig trees. *F. carica* requires wasp pollinator of a particular species of wasp (*Blastophaga psenes*) to produce seeds. *F. carica* plants can endure seasonal drought and the Middle eastern and Mediterranean climates especially suit it. When growing in a favourable habitat, old specimens of *F. carica* can reach to a considerable size and form large dense canopy and act as shade tree. Its aggressive root system precludes its use in many urban areas, but in nature it helps the plant to take root in

the most inhospitable areas.

The common fig tree or *F. carica* is actually a Phreatophyte that lives in areas with standing or running water, grows well in the valleys of the rivers and ravines saving no water, having strong need of water that is extracted from the ground. It can't withstand waterlogged soils. The fig tree, cools the environment in warm places, creating a fresh and pleasant habitat for many animals that take shelter in its shade in the times of intense heat.

Chemical composition :

Various parts of *F. carica* contain different chemicals. According to Joseph and Raj (2011), the chemicals present in stem, leaves, latex and seeds of *F. carica* are as under :

Stem : Campesterol, Hentriacontanol, Stigmasterol, Cuphorbol and its hexacosanate, Ingenol and Taraxerone.

Leaves : The leaves have 67% moisture, 4.3% protein, 1.7% fat, 4.7% crude fibre, 5.3% ash, 16.4% N-free extract, and 3.6% pentosans. Apart from these chemicals the other chemicals are carotene, bergaptene, stigmasterol, sitosterol, tyrosine, ficusin, taraxasterol, β -sitosterol, rutin, sapogenin, calotropenyl acetate, Lupeol acetate and oleanolic.

Latex : The latex is reported to contain caoutchouc (Natural rubber) (2.4%), resin, albumin, cerin, sugar, and malic acid, rennin, proteolytic enzymes, diastase, esterase, lipase, catalase, and peroxidase.

Seeds : Dried seeds contain 30% of a fixed oil containing the fatty acids: oleic acid 18.99%, Linoleic acid 33.72%, linolenic acid 32.95%, palmitic 5.23% stearic 2.18% and arachidic acid 1.05%. It is in an edible oil and can be used as a lubricant also.

Contents per 100 g of dried figs.

- Calories 310-352
- Carbohydrates 19.18-89 g
- Sugars 16.26 g
- Dietary fibres 2.9-7.0 g
- Fat 0.30-1.2 g
- Protein 0.75-7.0 g
- Ash 3.8 g

Vitamins

Thiamine (B1)	0.060 mg (5%)
Riboflavin (B2)	0.050 mg (4%)
Niacin (B3)	0.400 mg -2.00 mg (3-15%)
Pantothenic acid (B5)	0.300 mg (6%)
Vit. B6	0.113 mg (9%)
Folate (B9)	6 μ g (2%)
Choline	4.7 mg
Vit. C	2.0-9.22 mg
Vit. K.	4.7 μ g

Trace minerals :

Calcium	35 mg
Iron	0.37 mg
Magnesium	17.0 mg
Manganese	0.128 mg
Phosphorus	14.0 mg
Potassium	242.0 mg
Sodium	1.0 mg
Zinc	0.15 mg

Varieties of fig :

There are over 700 named varieties of fig trees which are grown, the world over, but several of them are of no use to home

gardeners. All the fig varieties fall into four major categories. These are-

1. Caprifigs : These figs produce staminate (male) flowers only, and hence never bear fruits. They play a role in pollinating the female or pistillate fig trees.

2. Smyrna : These figs bear all pistillate or female flowers and are to be pollinated by caprifigs to bear or produce fruits.

3. San Pedro: San Pedro figs produce two crops a year. One on leafless mature branches that requires no pollination and one on new branches that requires pollination by staminate flowers.

4. Common figs : Common figs are the types usually grown in home gardens. These trees do not require another tree for pollination. The figs that need pollination have an opening that allows the pollinating wasps entry to the internal flowers. Common figs don't need opening, as they are self pollinated and less susceptible to rot caused by insects and rainwater entering the fruit.

In this brief writeup, it is not possible to describe all the varieties, and hence few chosen ones are being given hereunder :

About George : This variety is from the garden of late 'Abou George' a Syrian immigrant who brought this variety to America from his home town. Dark medium figs, cold hardy, sweet and delicious.

Adriatic figs : These are some times referred to as white figs but actually these are pale green to pale yellow. They have bright pink to beautiful red inside and an extra sweet flavour.

Alma figs : These figs aren't much to look at but fruits have excellent rich flavour. It is a late ripener.

Balaglia : It's a late variety, delicious

green fig with dark red centre. It has a drop of honey on the eye. It tastes like a berry jam.

Barada : The tree originated in Sidnaya in Syria. It has been grown by Syrian immigrants in Pennsylvania. The fruits are small to medium, but it is packed with sugar and has a tasty and pleasant flavour.

Black Jack : It is grown in Central California and harvested during August - October. It is a semi dwarf tree. It produces large purplish brown Black mission like figs but much larger and with better flavour, sweet and very juicy, strawberry red flesh. Very best for fresh eating and drying.

Black Medeira : It is a vigorous variety and has an excellent rich flavour with very good taste. It performs well in containers.

Black Mission : They appear blackish purple and have dark pink flesh. They are so sweet that sometimes they ooze a small amount of syrup.

Black Portugal : This variety produces dark, sweet and large figs.

Black Triana: This variety of fig is said to have originated in Calabria, Italy. It has round shape and tastes sweet and juicy with thick skin. Black Triana bears two crops annually.

Blue Celeste : The plants are adapted to humid conditions. It is cold hardy also. It produces delicious small to medium sized fruits which are light brown with red tinge.

Brooklyn Dark : It is from Brooklyn, New York. It is cold hardy and the tree bears two crops of round dark figs with a pleasant flavour.

Brooklyn White : It is one of the best tasted white figs with very good flavour, it bears two crops a year.

Brown Turkey : It produces a crop of large sized tasty figs over a long season.

The fruits have attractive flesh and few seeds.

Brunswick : This variety is also known as Magnolia. It is susceptible to splitting in humid and rainy areas. The plant produces very large pale purple skinned with ambar coloured pulp and very sweet flavoured fruits. It has distinctive pointy leaves.

Byadi : The tree develops a straight and thick trunk quickly which can easily be trained to any shape. It produces medium sized figs with yellow skin. This variety is originally from Syria.

Calabrese Lena : Originally listed as Biana Calabrese. It is from Calabria Italy. The tree has very distinctive pointed leaves. It produces large white figs with light red sweet pulp.

Calimyrna : These are larger figs with more or less golden skin and a pinkish flesh with a distinctive nutty flavour. They can be served as such and are very gorgeous.

Capelas : This fig tree is slow growing and spreading. It is from St. Michael, Azores (Portugal) It produces large fruits with fair quality. Second crop is sweet with excellent flavour.

Carolina Dark : The variety is from Wilmington, North Carolina. The figs are large, dark purple and with ambar pulp. It has good sweet flavour.

Celeste figs: These figs have small to medium size and brown or purple coloured, which are borne by large trees. Celeste produces dessert quality fruits that ripen earlier than most of the other varieties.

Conadria : This variety produces two crops a year. It produces large yellow/light green figs with amber coloured pulp. These figs are known for their high sugar content and excellent flavour.

Deaha : The fig is said to have originated in the USA through the breeding

programme of Ira conetit. It is a medium large, golden yellow fig with strawberry pulp and a very fine flavour.

Hmari : A native of Syria & Middle East. It has excellent complex flavour. Early season variety which produces light green figs with red pulp.

Kadota : These figs have light green colour and not as sweet as other figs. They can be eaten with a pinch of salt.

King : The figs of this variety are cold tolerant and suitable for growing in Pacific Northwest, Himachal and Kashmir. It is a green skinned tear drop shaped fig with dark purple flesh.

LSU Gold : The variety was released by Louisiana State University. The figs are large and very sweet with flattened shape.

Lyndhurst white : This variety of fig was originally grown in Lyndhurst, New Jersey. The tree produces two crops of very large light green figs with a fine flavour.

Makedonia Dark : It is originally from Makedonia, Greece. The tree grows vigorously and produces very sweet figs which have a purple skin and red pulp. It is cold hardy.

Matta : Originally from Syria. One of the best tasting white figs. Very sweet and early variety, bears two crops. It has a drop of honey when fully ripe. It is resistant to rain.

Naples Green : These green figs are from Naples, which is on Tyrrhenian sea at east side of Mediterranean. It is of small to medium growth habit. The fruit has light green to yellowish green, very thin translucent skin. The pulp is pink to red, depending on the ripeness and has a very sweet taste.

Norland : It is reported to be cold hardy. It is also known as Nordland Berfeige. A fig from Switzerland, It has an excellent sweet flavour, the skin turns grey with blushes

of violet. The pulp is deep red.

Panache : This variety of fig is very vigorous and does equally well in ground as well as in containers. The figs have striped skin, red pulp and sweet flavour.

Paradiso Genoa : This fig tree comes from Genoa, Italy. The tree has pointed leaves and produces more or less elongated fruits with reddish skin and sweet flesh.

Persian White : The fig comes from Northern Iran. The fig is very productive and bears fruits with light green skin and yellow pulp. The fruits are of medium size.

Purple Genia : These figs are also known by Black Spanish or Purple Genia names. The variety produces large deep purple fruits with sweet red flesh.

Rmali : A fig variety from Syria. An early ripener. The figs have green skin and a deep red pulp. It is cold hardy.

Salem Dark : Another variety from Syria. The tree grows vigorously and highly productive. The figs are elongated with red pulp and sweet flavour.

Sefrawi : The fig originally comes from Syria. It produces yellow figs with pink pulp. The tree is vigorous and tolerant of cold conditions

Sierra : It is a new green variety introduced by breeders in 2006. This variety resembles Calimyrna. The fruits are large and round ideal for slicing.

Strawberry verte : It is a small tree producing small to medium sized green figs with burgundy interior. It has jam like consistency, but it is not sweet. It has closed eyes.

Sunfire : The fig is said to have been first collected from a neighbourhood of Allen town, Pennsylvania. It produces dark figs with deep red pulp. Very rich and sweet, and seems to show good cold tolerance.

Syrian Long : It is from Syria. It produces large elongated figs with tan colour, red pulp and a pleasant flavour. The leaves are very attractive.

Syrian '6' "Sweet joy" : The variety is from Amar, a village in Syria. It is an excellent fig with unique colour of the skin and pulp. The variety is cold resistant.

Syrian 200 : It is an elongated and excellent tasting fig from Syria. Tight eye of the fruits keeps the insects at bay.

Verns Brown Turkey : It is named after a garden writer Vern Nelson. It produces two crops a year. The figs are dark brown with light amber flesh and sweet flavour.

Vista : The tree produces medium to large pear shaped purplish black fruits with strawberry coloured flesh and nice flavour.

World wide Production of figs :

A number of countries produce Figs (*Ficus carica*) on commercial scale. They grow different varieties which are suited to their climatic conditions and also the taste of the natives. As the record reveals Turkey is the leading producer of fig. The table below reveals the fig production in various countries, estimated in 2016.

Country	Production (Tonnes)
Armenia	533.7143
Afghanistan	13922.6667
Albania	15443.476
Algeria	72898.2381
Argentina	942.1905
Australia	87.3333
Bolivia	2,466.1429
Brazil	21780.8571
Cameroon	56
China	5814.2857
Colombia	1217.5238

Cyprus	3,585.3333
Azerbaijan	9,065.857
Ecuador	23.8421
Egypt	203,238.4286
France	3,025.3810
Bosnia & Herzegovina	441.1905
Greece	50,368.4762
Croatia	3,724.428
India	12375.1429
Iran	75833.3333
Iraq	10,550.3333
Israel	1553.4762
Italy	21483.0952
Japan	15,152.3636
Jordan	2,304.6190
Lebanon	10587.3810
Libya	14,904.4286
Malta	306.8571
Mexico	3858.9048
Montenegro	4,187.125
Morocco	76,624.6190
Occupied Palestinian Territory	7,033.65
Pakistan	707.1429
Peru	3324.2381
Portugal	17859.5238
Qatar	141.5238
Serbia & Montenegro	3,152
Slovenia	52.3333
South Africa	1,757.7619
Spain	42856.0476
Syrian Arab Republic	44,032.2857
Tajikistan	676.6875
Tunisia	25785.7143
Turkey	262,643.6190
United Arab Emirates	476.333
United States of America	43,000.7619
Uzbekistan	1,821.8095
Yemen	3,976.9048

Medicinal utility of F. carica :

Chawla *et al.*, (2012). and Mawa *et al.*, (2013). have reviewed various pharmacognostic and phytochemical aspects of *F. carica*. The fruits of *F. carica*, especially the ripe ones are being used since time immemorial in the alleviation of several ailments. According to Werbech 1993, and Duke *et al.*, (2002) it has been traditionally used as metabolic, cardiovascular, respiratory, antispasmodic and anti inflammatory remedy. Leaves, fruits and roots of *F. carica* are used in native medicinal system in different ailments such as gastrointestinal disorders (Colic, indigestion, loss of appetite and diarrhoea), respiratory (bronchial problems, cough, sore throats), inflammatory and cardiovascular disorders (Burkill, 1935, Penelope, 1997).

Fruits of *F. carica* can be eaten fresh (when ripe) or dried or used as jam. Figs are excellent source of minerals, vitamins, carbohydrates, and dietary fibre because it is fat and cholesterol free and contain large number of amino acids (Solomon *et al.*, 2006, Veberic *et al.*, 2008a,b, Slanter *et al.*, 2011). Guarrera (2005), while discussing the traditional therapy in central Italy, reports that figs have been conventionally used for their therapeutic benefits as laxative, cardiovascular, respiratory, antispasmodic and antiinflammatory remedies. In traditional Indian medicine, ripe fruits are used as mild laxative, diuretic and expectorant (Solomon *et al.*, 2006).

It is also used as supplement in liver and spleen diseases. The dry fruits of *F. carica* are a supplement food for diabetics. It is commercialised in the market as sweet because of its high level of sugar contents

(Veberic *et al.*, 2008). Fruit paste is applied to swellings, tumors and inflammations for relieving pain (Mawa *et al.*, 2013).

According to Grieve (1971), figs are used for their mild, laxative action, and are employed in the preparation of laxative confections and syrups, usually with *senna* (*Cassia angustifolia*) and carminatives. It is believed that the laxative property resides in the saccharine juice of the fresh fruit and in the dried fruit is probably due to the indigestible seeds and skin. The three preparations of fig mentioned in the British Pharmacopoeia are *Syrup of figs*, a mild laxative, suitable for administration to children, *Aromatic syrup of figs*, *Elixir of figs* or sweet essence of figs, an excellent laxative for children and delicate persons, is compounded with compound tincture of rhubarb (*Rheum rhubarbarum*), liquid extract of senna (*Cassia angustifolia*), compound spirit of orange, liquid extract of cascara (*Rhamnus purshiana*) and syrup of figs. The compound syrup of figs is a stronger preparation and is more suitable for adults.

According to her, figs are demulcent as well as nutritive. Demulcent decoctions are made from them and employed in the treatment of catarrhal affections of the nose and throat. Roasted and split into two portions, the soft pulp of figs may be applied as emollient poultice to gumboils, dental abscesses and other circumscribed maturing tumours. They are said to have been used by Hezekiah as a remedy for boils, 2400 years ago.

Green fig jam is excellent and prepared from very juicy figs. Stalk is taken off without peeling them. Syrup can be made by taking 1/2 kg of sugar and two glasses of water for

each kg of fruit. Figs are put in the pot and cooked till the syrup pearls. A stick of cinnamon is boiled with that stuff, but removed before pouring the jam into containers. According to Chopra *et al.*, (1956), the fruits of *F. carica* are demulcent, aperient, emollient and nutrient, whereas milky latex from the fresh green fruits is acrid and used to destroy warts. The traditional uses of figs are given in table-1.

Anticarcinogenic (anticancerous) activity : Some studies on *F. carica* indicate that it has anticancerous activity also. It is reported that a mixture of 6-O-acyl- β -d-glucosyl sitosterols isolated from fig latex is an effective cytotoxic agent. It exhibited *in vitro* inhibitory effects on proliferation of various cancer cell lines (Yancheva *et al.*, 2005).

Antioxidant activity : *F. carica* contains a number of phytochemicals which are therapeutically very important. Some of them have antioxidant potential, and these phytochemicals act in different ways. They may act as reducing agents, hydrogen donors, free radical scavengers, singlet oxygen quenchers and by several other ways. Calirkan and Polat (2011) studied six commercial varieties of *F. carica* (black, red yellow and green) for total polyphenols, total flavonoids, antioxidant capacity and profile of anthocyanins. They determined the antioxidant properties by Ferric reducing antioxidant method. According to them, the fruits contained the highest levels of polyphenols, flavonoids and anthocyanins and exhibited highest antioxidant activity.

Antibacterial Activity : Studies of Jeong *et al.*, (2009) reveal that the methanolic extract of *F. carica* (MICs 0.156-5 mg/ml.,

M.BCs, 0.313 to 5 mg / ml) exhibited a strong antibacterial activity against oral bacteria. Combinatorial effects of methanol extract with ampicillin or gentamicin were synergistic against oral bacteria that showed that *figs could act as natural antibacterial agents*.

The latex of *F. carica* has also been found to have antibacterial activity (Aref *et al.*, 2010). Hexane, Chloroform ethyl acetate and methanol extracts of *F. carica* latex were found to have antibacterial activity against five bacterial species.

Antifungal activity : Aref *et al.*, (*loc-cit*) also investigated the antifungal potential of *F. carica* latex using the aforesaid extracts by disk diffusion technique. According to them the minimal inhibitory concentration (MIC) of the methanol fraction exercised total inhibition of *Candida albicans*, which was to the tune of 100% at a concentration of 500 µg/ml and a negative effect against *Cryptococcus neoformans*. They further say that methanolic extract (75%) strongly inhibited *Microsporum canis* and ethyl acetate extract at a concentration of 750 µg/ml.

Anti HSV activity : The aqueous extract of *F. carica* leaves has been studied on anti HSV effect by Wang *et al.*, (2004). They observed the effect of the extract on Hep-2, BHK21, and PRK cells. They report that the aqueous extract exhibited low toxicity and directly killed the virus effect on HSV. The MTC was 0.5 mg/ml. TDO was 15 mg/ml and TI was 30.0 mg/ml.

Antituberculosis activity : Khadabadi *et al.*, (2007) report that 80% methanol extract from the leaves of *F. carica* was screened

against *Mycobacterium tuberculosis* H37Rv using a colorimetric microplate based assay. They found antituberculosis activity with MIC value of 1600 µg/ml.

Nematicidal activity: Forty different plant species were screened for their nematicidal activity against the nematodes *Bursaphelenchus xylophilus*, *Panagrellus redivivus* and *Caenorhabditis elegans*. The leaf extract of *F. carica* showed the strongest nematicidal activity as 74.3, 96.2 and 98.4% mortality, respectively within 72 hours (Liu *et al.*, 2011).

Hypolipidemic Activity : The leaf extract of *F. carica* could be a beneficial supplement to modulate TG and TC in poultry liver (Asadi *et al.*, 2006). They extracted liver with abdominal fat from eight week old roosters. They sliced it and cultured with increasing concentrations of leaf extract, insulin and both of them. They found that insulin extensively increased TG secretion (0.190±0.013 mmol/L), T.G content (0.523±0.093 mmol/L), and TC secretion (1.727±0.412 mmol/L) beyond the basal level (P<0.001) and when the leaf extract was added, the effects were drastically reduced to the basal level in a concentration dependent manner (P<0.001).

Irritant Potential: Saeed and Sabir (2002) tested methanolic extract and isolated triterpenoids from the leaves of *F. carica* for irritant activity. They report that there was irritant potential on mice ears, calotropenyl acetate, methyl maslinate, and lupeol acetate were the most potent and importunate irritant which were less than those of *Euphorbium* and close to Psoralen. Irritant potential was evaluated by open mouse ear assay.

Antispasmodic and Antiplatelet

Activity : Mohamad *et al.*, (2011) investigated the effect of aqueous ethanolic extract for antispasmodic and antiplatelet activity on rabbit using *ex vivo* model of human platelets. *F. carica* was tested positive for alkaloids, flavonoids, coumarins, saponins, sterols, and terpenes and when it was tested in isolated rabbit jejunum. *F. carica* (0.1-3.0 mg/ml) produced relaxation of impulsive and low K^+ - (25 M) induced contraction with insignificant effect on high K^+ (80mM) similar to that caused by cromakalins. According to them, pretreatment of the tissue with glibenclamide caused rightward shift in the curves of low K^+ but did not cause high potassium ion, while verapamil equally repressed the concentration of K^+ ion at both concentrations. *F. carica* (0.6 and 0.12 mg/ml) repressed the adenosine 5- diphosphate and adrenaline induced human platelet aggregation. Their study revealed spasmolytic activity in the ripe dried fruits of *Ficus carica* probably mediated through the activation of Potassium ion ATP channels along with antiplatelet activity that provided sound pharmacological basis for its medicinal use in the gut motility and inflammatory disorders.

Anthelmintic Activity :

Amorin *et al.*, (1999) investigated the anthelmintic activity of the plant extract of *Ficus carica* in NIH mice naturally infected with *Syphacia obvelata*, *Aspiculuris tetraptera* and *Vampirolepis nana*. They administered the latex in doses of 3 ml/kg/day during 3 successive days, it was found effective in the removal of *S. obvelata* (41.7%), and did not produce significant elimination of *A. tetraptera* (2.6%) and *Unana* (8.3%). They also observed high acute toxicity with hemorrhagic enteritis.

Haemostatic effect : Richter *et al.*, (2002) found that ficin (mixture of proteases) present in latex of *Ficus carica* possessed the significant haemostatic effect by shortening the activated partial thrombo-plastin time and the prothrombin time. This showed that the haemostatic potency of *Ficus* proteases was based on activation of human coagulation factor X.

Hypocholesterolemic Activity :

Canal *et al.*, (2002) reported that the chloroform extract of *F. carica* leaves has significant activity on the secretion and cell content of cholesterol in HePG₂ cells and reduced the blood cholesterol level in streptozocin induced diabetic rats.

Immunomodulatory Activity :

Patil *et al.*, (2010b) investigated immunomodulatory effect of ethanolic extract of the leaves of *F. carica* in mice. The study consisted of various hematological and serological tests. According to them, the administrations of extract remarkably ameliorated both cellular and humoral antibody response.

Antimutagenic activity :

Agabeili and Kasimova (2005) investigated the antimutagenic activity of *Armoracia rusticana*, *Zea mays* and *Ficus carica* plant extracts and their mixture. According to them the *F. carica* plant extract decreased the level of mutations induced by *N*-metil *N*-nitro-*N'*-nitrosoguanidine (MNNG) in *Vicia faba* cells, chlorophyll mutations in *Arabidopsis thaliana*, and NAF induced mutability in rat marrow cells. The extract confirmed the ability to reduce the genotoxicity of environmental mutations.

Antipyretic Activity :

Patil *et al.*,

Table-1. Traditional and current uses of *Ficus carica* L.

Uses	Part used	Locality	Reference
Cough	Leaf	Malaysia	Mohamad <i>et al.</i> , 2011
Colic treatment	Fruit, root & leaf	Unspecifaed	Burkill, 1935; Penelope, 1997
Indigestion	" "	"	" "
Loss of appetite	" "	"	" "
Anti diarrhoeal	Fig	"	Duke <i>et al.</i> , 2002 Werbach, 1993
Metabolic	"	"	" "
Cardiovascular	" "	"	" "
Respiratory	" "	"	" "
Antispasmodic	" "	"	Gilani <i>et al.</i> , 2008
Antiinflammatory	" "	"	Duke <i>et al.</i> , 2002,
Antiplatelet, inflam	" "	"	Werbach, 1993
Antioxidant	Fig	Unspecified	Penelope, <i>et al.</i> , 1997
Laxative	"	"	Ishurd <i>et al.</i> , 2004
Prevention of nutritional anaemia	Leaf	"	Saeed & Sabir, <i>et al.</i> , 2002
Anthelmintic	Leaf	"	" "
Irritant potential	"	"	" "
Nutritive diet	Fruit	Mediterranean countries	Calirkan & Polat, 2011
Tuberculosis	Leaf	Malaysia	Khadabad <i>et al.</i> , 2007
Anticancer	Fruit	Unspecified	Rubinov, <i>et al.</i> , 2001, Perez <i>et al.</i> , 1999
Mild laxative, diuretic & Expectorant	Fruit	India	Khadabad, <i>et al.</i> , 2007

(2010a) investigated the antipyretic activity of *Ficus carica* leaves. According to them the ethanol extract of *F. carica* leaves at doses of 100, 200 and 300 mg/kg showed significant dose dependent reduction in normal body temperature, and yeast provoked elevated temperature. They report that the effect was extended upto five hours after drug administration, while compared to that of standard antipyretic agent (paracetamol 150 mg/kg bwt).

Hepatoprotective activity : Gond and Khadabadi (2008) report that they evaluated petroleum ether extract from leaves of *F. carica* for hepatoprotective activity on rats treated with 50 mg/kg of rifampicin orally, and significant reversal of biochemical, histological and functional changes induced by rifampicin on rats were observed. It therefore, indicates potential hepatoprotective activity of the leaves of this plant species.

Hypoglycaemic Activity : Investigation

of Perez *et al.*, (1998) reveal that the leaf extract of *F. carica* has considerable hypoglycaemic activity. According to them the leaf extract induced a significant hypoglycaemic effect in oral or intraperitoneal administration in streptozotcin-diabetic rats. They further report that weight loss was prevented in treated diabetic rats, and plasma insulin levels considerably altered the survival index. Their finding clearly indicates that aqueous extract of *F. carica* leaves has an obvious hypoglycaemic activity.

Health Benefits of fig in a nutshell :

The figs carry a number of health benefits. Some of these are given hereunder :

1. Antidiabetic or hypoglycaemic effects: Figs have hypoglycaemic effect and therefore are fruits of choice for diabetics.

2. Cardiac diseases : It is reported that figs bring down the levels of triglycerides within the blood, if used regularly. Triglycerides are the main types of fats associated with cardiac or heart diseases. They are also called ugly or bad fats and go around in the blood stream. Higher triglyceride levels lead to obesity and a variety of heart problems.

3. Lowering of blood pressure : As the figs are rich in potassium and minerals, they are hypotensive in action *i.e.*, high blood pressure patients are benefitted by its regular consumption.

4. Fights breast cancer : There are research reports which indicate that figs help in controlling post-menopausal breast cancer to the tune of 34%.

5. For weight management : Figs are loaded

with dietary fibers. Hence, they are perfect option for obese people, who wish to lose weight. High fibre diet slows down the digestion and cuts hunger.

Cultivation of fig : In most of the places, the figs are propagated by vegetative means, though they are also raised through seeds. There are four common methods for the cultivation of fig (*Ficus carica*).

1. Rooting figs indoors : This method is good for an early start for the places where spring weather is unsettled. Cuttings are taken from comparatively young branches preferably 2-3 years old. The thickness may vary from 12.5 mm to 6.0 mm and 20-30 cm long. The bottom end cut should be flat and the tip cut on a slant. Line the bottom of a 15 cm pot with news paper and add 5cm of sand or potting soil. Stand your cuttings treated with rooting hormone upright in the pot and fill around them with soil. Water the pot thoroughly.

Keep the fig cuttings warm and a bright (not direct sun) window. Don't water unless the soil becomes very dry. Wait a week after, you see new growth to remove the makeshift green house. When you see vigorous growth, plant your rooted fig cuttings in larger pots or outdoors, when the weather allows. Keep the transplants moist for the rest of the summer and watch them grow.

2. Rooting fig cuttings Outdoor : It is the most common and popular method for fig cultivation. Late in the dormant season, after the danger of frost or a very cold winter is past, take fig cuttings from small branches as said earlier. When starting a fig tree by this method, it is best to use six to eight shoots to

allow room for some failures.

Plant the rooting figs flat end about 30 cm apart burying 2-3 nodes inside the soil. Water well, but don't over irrigate. In one year, the fig cuttings can grow from 90 cm-1.20m. The new trees will be ready to transplant in the following dormant season.

3. Layering : Ground layering is a technique by means of which figs can be made to root. It is achieved by burying a portion of low growing branches with 15-20 cm of the tip showing above ground and allowing the buried portion to root, before severing it from the parent tree. While this is the simplest method of fig propagation, it can prove awkward for ground maintenance while the branches root.

Growing of figs from seeds : Although in most parts of the world, the figs are raised through cuttings, but they can also be propagated through seeds. For raising fig plants from seeds, the seeds are soaked in luke warm water for 1-2 days, before being planted into the soil. The viable seeds drop to the bottom of the glass after being soaked, while infertile/non-viable seeds will float on the surface. The viable seeds will have a chance to absorb moisture and they have a better chance of germination after being soaked.

Planting medium : The viable seeds should be germinated in a tray filled with moist granular bonsai mix, small lava grit or vermiculite, rather than regular compost or potting soil. Regular potting soil or compost could encourage the growth of molds before the seeds have germinated.

Humidity : For the germination, the seeds of fig require a warm and humid atmosphere. This can be achieved by placing

a plastic cover or bag over the top of the tray and placing the tray in a warm area that receives indirect sunlight. As long as the drops of water appear on the inside of the bag, the seeds don't require to be watered. The germination of fig seeds can take up to 8 weeks. Once small sprouts with leaves appear on the surface of the growing medium, the plants can be acclimatized to the humidity of the surrounding environment by removing the bag every day for a few hours. Fig trees have high degree of adaptability and can become accustomed to lower humidity levels as long as they receive regular watering.

Transplanting : When the seedlings have attained a height of about 5 cm, they can be gently removed from the seedling tray and planted into 12.5-20.0 cm pots. *Ficus* seedlings can be planted into regular potting soil and should be watered well for the first two weeks after transplantation. A thorough watering once every two days is best. After this period, they should only be watered when the soil surface is dry to touch. If kept in indirect light in the first month after transplanting, the fig seedlings perform well, and ready to be transplanted under direct sunlight.

**Production of fig plant through :
Tissue culture :**

In India apart from cultivation of figs through cuttings, tissue culture method is also being employed. AG Biotech is the only organization producing tissue culture fig plants in India from selected elite plus (Mother plants) with desirable characters. Tissue culture plants are disease and pest free and available round the year and ensure uniform growth, early maturity and high yields. They produce non

cracking fruits of uniform size. Fig plants raised through tissue culture start yielding after one year of planting. For better yield of figs, the following parameters matter.

1. *Soils* : *Ficus carica* grows well in deep, well drained black and sandy loams, it can tolerate a fairly high level of chloride salts but not sodium salts present in the soil. Red loams are highly suitable for its cultivation.

2. *Climate* : At temperatures above 38°C, fruits tend to ripen prematurely. Such premature fruits are small with tough skin. Dry climate with moderate temperature favours the production of large and succulent fruits.

3. *Planting* : Fig plants raised through cuttings, seeds or tissue culture can be planted any time during the year, but planting in July-September is preferred.

4. *Spacing* : A spacing of 2-3 meters between plant to plant and row to row is to be kept in mind for better yields.

5. *Irrigation* : The plants should immediately be irrigated soon after planting. During summer months irrigation at 10-12 days interval is required. Excessive irrigation at the time of fruit development and ripening results in splitting of fruits and inferior quality.

6. *Pruning* : Fig trees are generally headed but one metre plants are pruned annually to induce growth of flower bearing and increase the productivity.

7. *Harvesting and yield* : Figs after start bearing fruits from the first year (especially the tissue culture raised plants). The fruits should be harvested when they are ripe and mature.

In this brief review, I have tried my level best to give as much information as possible and it is not at all claimed to be

complete in all respects. I am highly indebted to all those researchers and writers on whose work I have freely drawn.

References :

1. Agabeili, R.A. and T.E. Kasinova (2005). Antimutagenic activity of *Armoracia rusticana*, *Zea mays* and *Ficus carica* plant extracts and their mixture. *Tsilologia I. Genetica* 39(3): 75-79.
2. Amorin, A. De., H.R. Borba, J.P.P. Carauta, D. Lopes, and M.A. Kaplan (1999). Anthelmintic activity of the latex of *Ficus* species. *Journal of Ethnopharmacology* 64(3): 255-258.
3. Aref, H.L., K.B.H. Salah, J.P. Chaumont, A. Fekih, M. Aouni and K. Saeed (2010). *In vitro* antimicrobial activity of four *Ficus carica* latex fractions against resistant human pathogens. *Pak Journal of Pharmaceutical Sciences* 23(1): 53-58.
4. Asadi, F., M. Pourkabir, R. Maclaren and A. Shahriari (2006). Alterations to lipid parameters in response to fig tree (*Ficus carica*) leaf extract in chicken liver slices. *Turkish Journal of Veterinary and Animal sciences*. 30(3): 315-318.
5. Burkill, I.H. (1935). A Dictionary of the economic products of Malay Peninsula. Ministry of Agriculture of Malaysia.
6. Canal, J.R., M.D. Torres, A. Romero and C.A. Perez (2002). A Chloroform extract obtained from a decoction of *Ficus carica* leaves, improves the cholestralaemia of rats with streptozocin induced diabetes. *Acta Physiol. Hung.* 87: 71-76.
7. Calirkan, O. and A. Aytakin Polat (2011). Phytochemical and antioxidant properties of selected fig (*Ficus carica* L.) accessions

- from the eastern Mediterranean region of Turkey. *Scientia Horticulturae* 128(4): 473-478.
8. Chawla, Anshul, Ramandeep Kaur and Anil Kumar Sharma (2012). *Ficus carica* Linn.: A review on its pharmacognostic, phytochemical and pharmacological aspects. *Int. J. Pharm. Phytochemical Res.* 1(4): 215-232.
 9. Chopra, R.N., S.L. Nayar and I.C. Chopra (1956). Glossary of Indian Medicinal plants. C.S.I.R., New Delhi.
 10. Duke, J.A., M.J. Bugenscutz-godwin, J. Du Collier and P.K. Duke (2002). Handbook of Medicinal Herbs 2nd edn., C.R.C. Press, Boca Raton, Fla, U.S.A.
 11. Farooqui, M.I.H. (1989). Plants of the Quran. Sidrah Publishers, Lucknow.
 12. Farooqui, M.I.H. (2004). Medicinal Plants in the Traditions of Prophet Muhammad Sidrah Publishers, Lucknow.
 11. Gilani, A.H., M.H. Mehmood, K.H. Janbaz, A.U. Khan and S.A. Saeed (2008). Ethnopharmacological studies on antispasmodic and antiplatelet activities of *Ficus carica*. *Journal of Ethnopharmacology*. 119(1): 1-5.
 12. Gond, N.Y. and S.S. Khadabadi (2008). Hepatoprotective activity of *Ficus carica* leaf extract on rifampicin induced hepatic damage in rats. *Indian Journal of Pharmaceutical Sciences*. 70(3): 364-366.
 13. Grieve, M. (1971). A Modern Herbal. Dover Publications Inc. N.Y.
 14. Guarrera, P. M. (2005). Traditional phytotherapy in Central Italy (Marche, Abruzzo and Latium) *Fitoterapia* 76(1): 1-25.
 15. Ishurd, O., F. Zgheel, A. Kermagi, M. Refla, M. Elmabruk, W. Yalin, J.F. Kennedy and Y. Pan (2004). Microbial (1 to 3). β .D. glucans from Libyan figs (*Ficus carica*). *Carbohydrate Polymers* 58(2): 181-184.
 16. Jeong, M.R., H.Y. Kim and J.D. Cha (2009). Antimicrobial activity of four *Ficus carica* latex fractions against Resistant human pathogens. *Pak. J. of Pharmaceutical Sciences* 23(1): 53-58.
 17. Joseph, Baby and S. Justin Raj (2011). Pharmacognostic and phytochemical properties of *Ficus carica* Linn. An overview. *International Journal of Pharm. Tech. Research* 3(1): 08-12.
 18. Khadabadi, S.S., N.Y. Gond, N.B. Chiwara and G.R. Shendarkar (2007). Hepatoprotective effect of *Ficus carica* leaf in chronic hepatitis. *Indian Drugs* 44(1): 54-57.
 19. Liu, F., Z. Yang, X.M. Zheng., S. Luo, K. Zhang and G. Li (2011). Nematicidal coumarin from *F. carica* L. *Journal of Asia Pacific Entomology* 14(1): 79-81.
 20. Mawa, Shukranul, Khairana Husain and Ibrahim Jontan (2013). *Ficus carica* L. (Moraceae) Phytochemistry, traditional uses and Biological activities. *Evidence Based complementary and Alternative medicine.*, Article I.D. 9742 56, 8 pages doi 101155 /2013/974256.
 21. Mohammad, S.N., M. Zin, H.A Wahab, P. Ibrahim, S.F. Sulaiman, A.S. Zahiruluddin and S.S. Noor (2011). Antituberculosis potential of some ethnobotanically selected Malaysian plants. *J. Ethnopharmacol.* 133(3): 1021-1026.
 22. Patil, V.S., C. Bhangala and V.R. Patil (2010a). Evaluation of antipyretic potential of *Ficus carica* leaves *Int. J. Pharm. Sci. Review & Research* 2(2): 45-50.
 23. Patil, V.S., C. Bhangale and V. Patil (2010b). Studies on immunomodulatory activity of *Ficus carica*. *Int. J. Pharm. Pharm. Sci.*

- 2(4): 97-99.
24. Penelope, O. (1997). Great Natural Remedies. Kyle Cathic Limited, New York, U.S.A.
 25. Perez, C., E. Dominguez, J.M. Ramiro, A. Romero, J.E. Campillo and M.D. Torres (1996). A study on the glycaemic balance in streptozotocin. diabetic rats treated with an aqueous extract of *Ficus carica* (Fig tree) leaves *Phytotherapy Research*. 10(1): 82-83.
 26. Perez, C.E., Y. Kashman, R. Rabinowitz, M. Sehlesinger and R. Mechoulam (2001). Suppression of cancer cell proliferation from fig (*Ficus carica*) resin. Isolation and structure elucidation. *Journal of Natural Products* 64(7): 993-996.
 27. Richter, G., H.P. Schwarz, F. Domer and L. Peter (2002). Activation and inactivation of human factor X by proteases derived from *Ficus carica* Linn. *British Journal of Haematology*, 119: 1402-1051.
 28. Saeed, M.A. and A.W. Sabir (2002). Irritant potential of Triterpenoids from *Ficus carica* leaves. *Fitoterapia* 73(5): 417-420.
 29. Slatner, A., U. Klancar, F. Stampar and R. Veberic (2011). Effect of drying of figs (*Ficus carica* L. Var. Mission) fruit on the contents of sugars, organic acids and phenolic compounds. *Journal of Agricultural and food Chemistry* 59(21): 11696-11702.
 30. Soloman, A., S. Golubowicz, Z. Yablowicz, et al., (2006). Antioxidant activities and anthocyanin content of fresh fruits of Common fig (*Ficus carica* L.). *Journal of Agricultural and food chemistry* 54(20): 7717-7723.
 31. Veberic, R., J. Jakopic and F. Stampar (2008a). International fruit quality of figs (*Ficus carica* L.) in the Northern Mediterranean Region. *Italian Journal of food Science* 20(2): 255-262.
 32. Veberic, R., M. Colaric and F. Stampar (2008b). Phenolic acids and Flavonoids of fig fruit (*Ficus carica* L.) in the Northern Mediterranean Region. *Food chemistry* 106(1): 153-157.
 33. Wang, G., H. Wang, Y. Song, C. Jia, Z. Wang and H. Xu (2004). Studies on anti HSV effect of *Ficus* leaves. *Zhong Yai Cai*. 27(10): 754-756.
 34. Werbach, M. (1993). Healing with food, Harper Collins, New York, N.Y. U.S.A.
 35. Yancheva, S.D., Golubowicz, Z. Yablowicz, A Perl and M.A. Flashman (2005). Efficient *Agrobacterium* mediated transformation and recovery of transgenic fig (*Ficus carica* L.) plants. *Plant Science* 168(6): 1433-1441.