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Anjeer (*Ficus carica* Linn.): A famous fruit with distinct pharmacological properties: A review

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Abstract
Anjeer (*Ficus carica* Linn.) is a well known fruit and an important Unani Medicine mentioned in classical Unani literature with significant pharmacological activity. It is being used as Mughazzi (Nutritive), Mulyyan (Laxative), Muqawwi baah (Aphrodisiac), Daf-e-Waram (Anti-inflammatory), Mukhrij Balgham (Expectorant) and Mudrr-e-Baul (Diuretic) since long times. This fruit has remarkable nutritional ingredients besides pharmacological properties. The aim of this review is to highlight its medicinal and nutritional properties that benefit the people.

Keywords: Fig, *Ficus carica* Linn, Unani Medicine, Pharmacological properties

Introduction
The Unani system of medicine believes in two types of diet/drug. First is Ghiza-e-Dawaee and second is Dawa-e-Ghizaee. Ghiza-e-Dawaee is having nutritive part more dominant while as Dawa-e-Ghizaee is having prominent medicinal property. In case of Anjeer it has been classified as Dawa-e-Ghizaee [1]. Anjeer (*Ficus carica* Linn.) is well known fruit which is well described in classical Unani literatures and pharmacopoeia. It belongs to the family Moraceae [2]. Its common English name is Fig. Literature shows that figs are cultivated for over 11,000 years and are the earliest cultivated plants predated for human use [3]. Giving a fig means to care about someone. Even the Olympic athletes were given figs as a training food and figs were given as laurels to the winners of the first Olympics as a medal [4]. Fig trees are cultivated throughout the world as the best sources of medicine as well as good food for people, and their domesticated animals [5].
Fig is distributed in Southwest Asia and the Eastern Mediterranean region, from the Turkey in the East to Spain and Portugal in the West; it is also grown commercially in parts of U.S.A. and Chile and to small extent, in Arabia, Persia, India, China and Japan. It is cultivated in India commercially at few centres near Pune (Maharashtra) and Bellary and Anantpur districts (South India). In Punjab, Uttar Pradesh and Mysore, it is mostly grown scattered in gardens or in homeyards [6]. *Ficus carica* is the type species of the genus *Ficus*, containing over 800 tropical and subtropical plant species [7].

Vernacular Names (*Mutradifat*) [2]
Arabic : Teen
Persian : Anjeer
Urdu : Anjeer
Bengali : Anjir
English : Fig
Gujarati : Anjir
Hindi : Anjir
Kannada: Anjura, Simeyetti
Malayalam: Simayatti
Punjabi : Fagari
Sanskrit : Anjira
Tamil : Simaayatti, Tenatti
Telegu : Anjuro, Manjimedi

Taxonomy [7, 8]
Kingdom - plantae
Subkingdom - tracheobionta
Superdivision - spermatophyta
Division - magnoliphyta
Class - maghnoliosida
Subclass - hamamelididae
Order - urticales
Family - moraceae
Genus - Ficus
Species - carica

Description [2, 7]
Macroscopic: *Ficus carica* is a deciduous tree or large shrub that grows up to 7–10 m (23–33 ft) tall, with smooth white bark. Its fragrant leaves are 12–25 cm (4+½–10 in) long and 10–18 cm (4–7 in) wide, and are deeply lobed (three or five lobes). Dried fruits of *Ficus carica* Linn are compressed to a circular shape with a central hole 4-6 cm. in diameter, 1 cm thick. Surface of the fruit is wrinkled and light yellow to brown in colour. The fruit contains many small seeds in pulpy mesocarp.
Microscopic: In transverse section epidermis of epicarp consists of single layer of oval or barrel shaped cell coated with thick cuticle. Hypodermal region consists of thick walled collenchymatous cells which are almost hexagonal to polygonal and 3-5 cells in thickness. These cells contain yellowish brown contents. Few cells contain rosette crystals of calcium oxalate brownish black in colour. The mesocarpic region cosists of large, thin walled, ovate to polygonal or squarish parenchymatous cells without intercellular spaces. The laticifers appearing in this region are elongated tubular and few are branched laticifers give positive test of tannin. In surface view the epicarp shows thick walled parenchymatous cells which are oval to polygonal. The anomocytic type of stomata are observed which are abundant. The numerous guard cells are oval to round containing starch grains. The powdered drug is brown in colour. Under the microscope it shows the presence of cells of epidermis, hypodermis and thick walled paenchymatous cells of testa.

File photo of *Ficus carica* Linn. [figure can be viewed at https://en.wikipedia.org/wiki/Fig]

Identity, Purity & Strength [2]
Foreign matter: Not more than 2 %, Total ash: Not more than 4 %, Acid-insoluble ash: Not more than 1%, Alcohol-soluble extractive: Not less than 20%, Water-soluble extractive: Not less than 52%.

Important Formulations [2]
Sufoof-e-Bars, Zimad-e-Kibreet.

Phytochemistry
Phytochemical research carried out on *Ficus carica* has led to the isolation of phytosterols, anthocyanins, amino acids, organic acid, fatty acids, phenolic components, hydrocarbons, aliphatic alcohols, volatile components, and few other classes of secondary metabolites from its different parts. Mostly these phytochemicals are found in latex followed by leaves, fruit, and root. Some of the phytoconstituents of *Ficus carica* are used in the production of sunscreen and coloring agents [8].

Temperament (Mizaj)
Anjeer (Fresh) Hot 1^0 and Moist 2^0 [1, 2, 9]
Anjeer (Dry) Hot 2^0 and Moist 1^0 [9]

Method of Uses (Tarkeeb-e-Istemalat)
Anjeer is prescribed both for oral administration and for external topical application in the form of a paste (Zamad) and powder (Sufoof) [2].

Pharmacological Actions (Af'aal)
Mughazzi (Nutritive) [1, 9]
Fattening Agent [1, 9]
Mulayyen (Laxative) [1, 2, 9]
Mulattif (Demulcent) [1, 2, 9]
Kasir-e-Riyah (Carminative) [9]
Munzij (Decoctive) [1, 2, 9]
Mushil (Purgative) [9]
Muqavvi-e-Jigar (Liver Tonic) [9]
Muhallil-e-Waram (Anti-inflammatory) [1, 2, 9]
Muqavvi-e-Badan (General Tonic) [1, 9]
Munaffis-e Balgham (Expectorant) [1, 9]
Moarrique (Diaphoretic) [1]
Daf-e-Bukhar (Anti-pyretic) [1, 9]
Mudirr-e-Baul (Diuretic) [1]
Muqavvi-e-Bah (Aphrodiasiac) [1]
Detergent (Jali) [9]

Therapeutic Uses (Mahal-e-Istemalat)
Constipation [1, 9], Thinness of Body & Kidney [1, 9], General Weakness [1], Phlegmatic Cough [9], Asthma [1, 9], Chickenpox [1], Typhoid [1], Fever [1, 9], Epilepsy [2, 9], Madness [9], Paralysis [9], Sexual Debility [1], Palpitation [9], Soar Throat [9], Dribbling of Urine & Dysuria [9], Inflammation of Spleen [1, 2, 9], Endometritis [9], Antidote to Poisons [9], Oedema [9], Diptheria [9], Pityriasis alba [9], Leucoderma [9], Warts [9]

Adverse Effects (Muzir Effect)
Adverse effect to the obstruction of Liver [1]
Eating in excess causes itching and zoon [9]
Adverse effect to Liver, Weak Stomach and [9]

Antidote (Musleh)
For Moist - Sikanjabeen, sharbat Turanj / Rebas (Syrup of *Citrus medica / Rheum emodi* [1, 9]
For Dry - Akhrot (*Juglans regia*), Satar (*Satureja hortensis*), Anisoon (*Pimpinella anisum*) [9]

Substitute (Badal)
Maweez (*Vitis vinifera*) [1]
For Lungs – Chilghoza (*Pinus gerardiana*) [9]

Therapeutic Dosage (Miqdar-e-Khurak)
Anjeer (Dry) 10-12 Number [2]
Anjeer 2-3 Unit [1]
Anjeer (Dry) Upto 11.25 Tola, 10-20 Units [9]
Anjeer (Fresh) 28 Tola and 4.5 Masha [9]
Anjeer (Syrup) upto 4.5 Tola [9].

Nutritive value
Ficus carica is widely grown for its edible fruit. These are sweet and succulent, a fully ripe specimen is an exquisite fruit that almost literally melts in the mouth. The fruit is often dried for later use and this dried fruit is a major item of commerce. Figs are one of the highest plant sources of calcium and fiber. According to USDA data for the Mission variety, dried figs are richer in fiber, copper, manganese, magnesium, potassium, calcium, and vitamin K, relative to human needs. They have smaller amounts of many other nutrients. On a weight basis, figs contain more calcium (132.5 mg/100 g) as compared with apples (7.14 mg/100 g), bananas (3.88 mg/100 g), dates (25.0 mg/100 g), grapes (10.86 mg/100 g), orange (40.25 mg/100 g), prunes (18.0 mg/ 100 g), raisins (40.0 mg/100 g), and strawberries (14.01 mg/ 100 g). According to Pasman *et al*. (1997) the average energy intake decreased significantly after the supplementation of fiber-rich food [10]. A recent study has shown that the addition of a soluble fiber supplement to the dietary food material could aid in weight loss. Thus, figs and their soluble fiber may be of help in weight reduction, because figs provide more fiber (12.21 g/100 g) than all the above-mentioned common fruits [3]. Phenolics are an important constituent of fruit quality because of their contribution to the taste, color, and nutritional properties of fruit [11].

Pharmacological Activity
1. Antioxidant Activity: *F. carica* contains many phenolic compounds that play many physiological roles in plants. Some of them are also favourable to human health, since they are able to act as an antioxidant by different ways: reducing agents, hydrogen donators, free radical scavengers, singlet oxygen quenchers, and so forth. Fig fruits of *F. carica* were studied with six commercial fig varieties with different colors (black, red, yellow, and green) for total polyphenols, total flavonoids, antioxidant capacity, and profile of anthocyanins. The antioxidant properties were determined by ferric reducing antioxidant method. Fruits contained the highest levels of polyphenols, flavonoids, and anthocyanins and exhibited the highest antioxidant capacity [12, 13].

2. Hepatoprotective Activity: The petroleum ether extract from leaves of *F. carica* was evaluated 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 indicated potential hepatoprotective activity [14, 15].

3. Antispasmodic and Antiplatelet Activity: The aqueousethanolic extract of *F. carica* was investigated for antispasmodic effect on rabbit and antiplatelet effect 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 mM) induced contraction with insignificant effect on high K+ (80 mM) similar to that caused by cromakalim. 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 potassium ion at both concentrations. *F. carica* (0.6 and

0.12 mg/mL) repressed the adenosine-5-diphosphate and adrenaline-induced human platelet aggregation. That study exhibited spasmolytic activity in the ripe dried fruit of *F. 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 [16].

4. Hypoglycamic Activity: The leaf extract induced a significant hypoglycamic effect in oral or intraperitoneal administration in streptozotocin induced diabetic rats. Weight loss was prevented in treated diabetic rats, and plasma insulin levels considerably altered the survival index. Results indicated that the aqueous extract of *F. carica* has an obvious hypoglycemic activity [17].

5. Hypolipidemic Activity: The leaf extract of *F. carica* could be a beneficial supplement to modulate TG and TC secretion in poultry liver [45]. Eight-weeks-old rooster's liver with high abdominal fat was extracted, sliced, and cultured with increasing concentrations of leaf extract, insulin, and both of them. While insulin extensively increased TG secretion (0.190 ± 0.013 mmol/L), TG 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 ($P < 0.001$) [18].

6. Antibacterial Activity and Anti-Fungal Activity: The methanol extract of *F. carica* (MICs, 0.156 to 5 mg/mL; MBCs, 0.313 to 5 mg/mL) showed a strong antibacterial activity against oral bacteria. The combination effects of methanol extract with ampicillin or gentamicin were synergistic against oral bacteria that showed that figs could act as a natural antibacterial agent [19]. Hexane, chloroform, ethyl acetate, and methanol extracts of *F. carica* latex were investigated for their antimicrobial proprieties *in vitro* against five bacterial species and seven strains of fungi using disc-diffusion method. The minimal inhibition concentration (MIC) of the methanol fraction showed a total inhibition against Candida albicans (100%) at a concentration of 500 μg/mL and a negative effect against Cryptococcus neoforman; methanolic extract (75%) strongly inhibited Microsporum canis and ethyl acetate extract at a concentration of 750 μg/mL [20].

7. Antipyretic Activity: The ethanol extract of *F. carica*, at doses of 100, 200, and 300 mg/kg, showed significant dosedependent reduction in normal body temperature, and yeast provoked elevated temperature. The effect extended up to five hrs after drug administration while compared to that of standard antipyretic agent, paracetamol (150 mg/kg.b.wt., p.o.) [21].

8. Antituberculosis Activity: The 80% methanol extract from the leaves of *F. carica* has been screened against Mycobacterium tuberculosis H37Rv using a colorimetric microplate-based assay. The result exhibited anti-tuberculosis activity with MIC value of 1600 μg/mL [22].

9. Anticancer Activity: A mixture of 6-O-acyl-β-d-glucosyl- β-sitosterols has been isolated as an effective cytotoxic agent from fig (*F. carica*) latex that showed *in vitro* inhibitory effects on proliferation of various cancer cell lines [23].

10. Irritant Potential: The methanol extract and isolated triterpenoids from the leaves of *F. carica* were tested for irritant activity. They exhibited irritant potential on mice ears, and calotropenyl acetate, methyl maslinate, and lupeol acetate were the most potent and importunate irritant is which were less than those of euphorbium and close to psoralen. Irritant potential was evaluated by open mouse ear assay [24].

11. Anthelmintic: The anthelmintic activity of the latex of *F. carica* was investigated in NIH mice naturally infected with Syphacia obvelata, Aspiculuris tetraptera, and Vampirolepis nana. The latex was administered in doses of 3 mL/kg/day during three successive days, was effective in the removal of S. obvelata (41.7%), and did not produce significant elimination of A. tetraptera (2.6%) andV. nana (8.3%). High acute toxicity with hemorrhagic enteritis was observed; additional to a weak anthelmintic efficacy, was not recommended the use of this lattice in traditional medicine [25].

12. Antimutagenic: Antimutagenic activity of the plant extract of *F. carica* on environmental xenobiotics was investigated. The 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 verified the ability to decrease the genotoxicity of environmental mutagens [26].

13. Oxidative Stress: Oxidative stress was studied in rats divided into 4 groups: streptozotocin-induced diabetic rats ($n = 10$), diabetic rats that received a single dose of a basic fraction of *F. carica* extract ($n = 14$), diabetic rats that received a single dose of a chloroform fraction of the extract ($n = 10$), and normal rats ($n = 10$). Compared to normal animals, the diabetic animals exhibited extensively higher values for erythrocyte catalyze normalized to haemoglobin levels (1.5 ± 0.15 versus 0.96 ± 0.18 μg/mg) and for plasma vitamin E (73.4 ± 43.9 versus 12.0±1.6 mg/L), monounsaturated fatty acids (0.219 ± 0.118 versus 0.067 ± 0.014 mg/mL), polyunsaturated fatty acids (PUFA, 0.567 ± 0.293 versus 0.175 ± 0.040 mg/mL), saturated fatty acids (0.779 ± 0.262 versus 0.401 ± 0.055 mg/mL), and linoleic acid (0.202 ± 0.086 versus 0.106 ± 0.014 mg/mL). Both *F. carica* fractions showed that they normalize the values of the diabetic animal's fatty acids and plasma vitamin E values. They showed statistically significant differences as a function of diabetes with the vitamin E/C 18:2 ratio being normalized by the administration of the chloroform fraction (to 152.1 ± 80.3 μg/mg) and the vitamin A/C 18:2 ratio being raised relative to the untreated diabetic rats by the administration of the basic fraction (91.9 ± 14.5 μg/mg). That study confirmed that antioxidant status was affected in the diabetes syndrome, and *F. carica* extracts showed that they normalize it [27].

Conclusion

Anjeer/ Fig contains so many important phytoceuticals / neutraceuticals such as phytosterols, anthocyanins, amino acids, organic acid, fatty acids, phenolic components, hydrocarbons, aliphatic alcohols, volatile components, and few other classes of secondary metabolites which contribute its nutritional and pharmacological properties. After the covid-19, Immunity has been reduced drastically resulting in weakness and increased frequency of getting sick of the

people. So there is need of such food/fruit that is full of essential nutrients that could make body strong resulting in increased immunity and if such food possesses distinct pharmacological activity then it would be more beneficial. The above mentioned summary about *Ficus carica Linn.* clearly shows that it is a very important plant from ethnobotanical, pharmacological, and nutritional point of view.

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Conflict of Interest
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