



REVIEW

Medicinal and Pharmacological Potentiality of the Plant At-Tin-Common Fig (*Ficus carica* L.)

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At-Tin (*Ficus carica* L.) of family Moraceae is commonly known as edible fig. This plant has been mentioned in the Holy Qur'an (in Sura 'At-Tin') only once. Islamic scholars have different views regarding the interpretation of the plant At-Tin. Most of them have interpreted it in the meaning of common fig in their interpretation on the Holy Qur'an. According to some authorities the fig means Mosque of Syria or Mountain of Syria or Mosque of Nuh which was built upon the Mountain Al-Judi. Some commentators say that At-Tin signifies a mountain nearby to which 'Jerusalem' is situated and that is the place of birth of Hazrat Essa (Alaihi Salaam). The fruit of *Ficus carica* (Fig) has been widely used in traditional medicine as laxative, anthelmintic, demulcent, emollient, galactagogue, vermifuge, nutritive, stimulant for the brain, poultice for gumboils and for the treatment of anemia, dental abscesses, heart-disease, hemorrhoids, osteoporosis and tumors. Consequently, fig has been extensively studied for its biological activities and has been shown antibacterial, antifungal, antiviral, antiwart, anticancer, antidiabetic, antiinflammatory and antioxidant properties.

Key Words: *Ficus carica*, Qur'an, Pharmacological Potential.

INTRODUCTION

The Holy Qur'an is the last revealed book and the only complete divine guidance that exists in the world for mankind¹. The Holy Quran from the very start has a claim that it covers every aspect of life and is full of wisdom². Sura 'At-Tin' is only one surah from the Qura'n which has taken its name from its 1st verse indicating a specific plant, At-Tin, "The Fig."³

According to the Holy Qura'n (Surah 95. At-Tin, Verse 1-4): "By the fig and the olive, By mount Sinai, By this city of security (Makkah). Verily, We created man in the best stature (mould)"⁴. Our Holy Prophet (Sallallohu Alayhi Wassallam) used certain herbs and recommended various medicinal plants for cure of common diseases. He recommended fig for the treatment of piles and rheumatism⁵. Hazrat Abu Darda (Radialloho Anho) narrates that Rasullullah (Sallallhu Alayhi Wasallam) said, "Eat fig, for it cures the piles and is useful for rheumatism"⁶. In another Hadith, Hazrat Abu Darda (Radialloho Anho) narrates that someone presented to the Prophet a plate containing figs. He said, "eat figs! If I would say a certain type of fruit was sent down to us from the heavens

I would say it's a fig because it has no seeds. It ends (cures) the piles and is useful for rheumatism."⁷

According to Ibn Sireen, a scholar in the science of dreams, figs, if seen in dreams, denote wealth and prosperity. The benefits I have restricted myself to mentioning here is an indication of the compassion, Allah feels for human beings⁸.

Fig (*Ficus carica*) is one of the earliest fruits cultivated⁹. According to some commentators, when the man appeared on the earth, the first tree planted for his benefits was the fig¹⁰. When Hazrat Adam (Alayhi Salam) and Hazrat Hawa (Alayha Salam) were expelled from the paradise and they knew that they were naked, they sewed fig leaves together and made themselves aprons^{10,11}.

The fig is the most mentioned fruit in the Bible. Ancient records indicate both King Urukagina of the Sumarian era (2900 B.C.) and the Assyrians (2000 B.C.) were familiar with fig¹². They also mentioned in a Babylonian hymnbook dated about 2000 B.C. Every inhabitant of Athens was a "philosykos," literally translated, "a friend of the fig"⁹.

The early Greeks so highly prized figs that it was considered an honor to bestow the foliage and fruit. In the original

olympic games, winning athletes were crowned with fig leaves and given fig fruits to eat¹².

Figs were one of the crops that became known in China during the T'ang dynasty which rose to power in the 700's BC¹³. By the end of the Roman Empire during 5th century, fig culture was well distributed throughout the Mediterranean and along the shores of the Atlantic¹².

Pliny the Elder (AD 23-79) records several stories about fig trees in Rome. He asserts that a sacred fig tree grows in the Roman Forum. Alluding to the myth that Rome was founded by the twins, Romulus and Remus, who suckled on a she-wolf, Pliny tells us that, "This tree is known as Ruminalis because the she-wolf was discovered beneath it giving her teats (*rumis* in Latin) to the infant boys"¹³.

In the first half of the sixteenth century, the fig was brought to England by Cardinal Pole, a few years before Cortez introduced the tree to Mexico. Fig trees reached North America in about 1790¹³. Figs were first introduced into the New World by Spanish and Portuguese missionaries¹².

Interpretation of 'At-Tin' (Fig) by Islamic Scholars:

There are different views of commentators about the interpretation of 'At-Tin' (fig) mentioned in the Holy Qur'an. Most of them have interpreted it in its actual meaning (*i.e.* common fig plant) and described its medicinal and nutritional qualities in their commentaries on the Holy Quran^{14,15}. Some authorities are reported to have interpreted it as the Mosque of Syria or Mountain of Syria¹⁶, Noah's mosque on Mount Judei (Ibn Abbas--), the earth of Damascus where Hazrat Essa (Alaihi Salaam) was born¹⁷, the mosque of the sleepers in the cave¹⁸, a mountain near Jerusalem¹⁹. According to some authorities the fig symbolizes the countries in which this tree predominates, *i.e.* Palestine and Syria²⁰, a mountain of the sacred earth or a mosque of Damascus or a famous city²¹, the place where Hazrat Ibrahim (Alaihi Salaam) migrated^{22,23}.

Allah has sworn by this tree (At-Tin) due to its multitude of benefits that come from this tree and its fruit; additionally, to the fact that its overwhelming presence in the land of as-Sham [Sierra] is the same place where 'Esaa' (son of Mary) Alaihi Salaam was given the prophethood²⁴. The various views of Islamic scholars have been summarized in Table-1.

Taxonomic aspect: Botanical name: *Ficus carica* L.; Family: Moraceae; English name: Common Fig; Local name: Anjeer; Arabic name: At-Tin; Habit & Habitat: A small tree cultivated in poor soil; Part used: Fruit, leaves, latex.

Description: A small deciduous tree, 5-6 m high; shoots densely pubescent. Leaves petiolate, petiole 1.8-3.5 cm long densely pubescent, lamina ovate to ovate-cordate, 4.3-12.8 × 5.4-12 cm, acute, serrate, scabrid on the upper side, wooly tomentose beneath, lateral veins 8-9 pairs. Hypanthodium (inflorescence) axillary. Male flowers with 3-5 perianth segments and 3-5 stamens. Female flowers with 5 perianth segments; ovary with lateral style, stigma 1-2. Fruit usually pyriform-obovoid, 2-3.8 × 1-2.8 cm, hispid, yellowish to brownish violet²⁵.

Distribution: Cultivated and sub spontaneous in India, Pakistan, Afghanistan; Russia, Iran, Middle East, N. Africa and Europe. Today the United States, Turkey, Greece and Spain are the primary producers of dried figs⁹.

TABLE-1
VIEWS OF ISLAMIC SCHOLARS ABOUT THE
INTERPRETATION OF FIG MENTIONED IN HOLY QURAN

| S. No. | Name of the commentator | Views | Ref. |
|--------|---|--|------|
| 1 | Abdullah bin Ahmad bin Mahmood An-Nasafi | Common Fig | 63 |
| 2 | Abdul Hameed Swati | Common Fig | 64 |
| 3 | Abdul Majid Daryabadi | Common Fig | 15 |
| 4 | Abdullah Yousaf Ali | Common Fig | 65 |
| 5 | Abu 'Abdullah Al-Qurtubi | Mosque of the sleepers in the cave | 18 |
| 6 | Abu ashaathaa Jabir bin Zaid Alazdy | Common Fig | 66 |
| 7 | Abul Kalam Azad | The earth of Damascus | 17 |
| 8 | Abu Muhammad Abdul Haq Haqqani | Mountain of Syria | 67 |
| 9 | Abu Tahir Muhammad Bin Yaqoob Al-Ferozabadi | Mosque of Syria or Mountain of Syria | 16 |
| 10 | Abi Muhammad Al-Hussain Bin Mas'ud Al-Baghvi | Mountain of Syria | 68 |
| 11 | Al-Hassan bin Yasaar Al-Basri | Common Fig | 66 |
| 12 | Allaud Din Ali Bin Muhammad Bin Ibrahim Al-Bughdadi Al-Khazin | Common Fig | 69 |
| 13 | Al-Qazi Naasir-ud-Din Abi Saeed Abdullah Bin Umar Al-Bayzawi | Common Fig | 14 |
| 14 | Al-Syed Mehmood Alusi Al-Bughdadi | Common Fig | 70 |
| 15 | Attaa bin Abi Ribah | Common Fig | 66 |
| 16 | Syed Hamid Hassan Balgrami | Common Fig | 71 |
| 17 | Fakhruddin Al-Razi | Common Fig | 72 |
| 18 | Ibrahim Nakh'i | Common Fig | 66 |
| 19 | Ikrama Maula ibn Abbas | Common Fig | 66 |
| 20 | Ismail ibn Kathir | Common Fig | 18 |
| 21 | Jarullah Mehmood bin Umar Al-Zemakhshari | Common Fig | 73 |
| 22 | Subhan-Ul-Hind Maulana Ahmad Saeed | Common Fig | 74 |
| 23 | Maulana Hussain Ali | Place where Hazrat Ibrahim (A S) migrated | 22 |
| 24 | Mufti Muhammad Shafi | The land of the tree (Palestine and Syria) | 20 |
| 25 | Muhammad Abdur Rashid No'mani, | Common Fig | 21 |
| 26 | Muhammad Afzal Khan | Place where Hazrat Ibrahim (A. S) migrated | 23 |
| 27 | Muhammad Ashraf Ali Thanawi | Common Fig | 75 |
| 28 | Muhammad ibn Jarir Al-Tabari | Common Fig | 18 |
| 29 | Mujahid bin Jabr | Common Fig | 66 |
| 30 | Muhammad Shah Abdul Qadir | A garden on a hill | 76 |
| 31 | Qazi Muhammad Sana Ullah Pani Patti | Common Fig | 77 |
| 32 | Shabir Ahmad Usmani, 1989 | Common Fig | 19 |
| 33 | Shaykh 'Abdur Rahman as-Sa'di | Fig tree, Sierra | 24 |

Medicinal uses: Fig has been extensively studied globally, which justifies its broad traditional therapeutic value. The fruit, root and leaves of *Ficus carica* are used in the native system of medicine in different disorders such as Gastro intestinal (colic, indigestion, loss of appetite and diarrhea), respiratory (sore throats, coughs and bronchial problems), inflammatory and cardiovascular disorders and as antispasmodic²⁶.

The fruits are used as a galactogogue and tonic and as a poultice in the treatment of gumboils, dental abscesses, tumors and other abnormal growths. Fresh and dried figs fruit and its

syrup have long been appreciated for their laxative action^{27,28}. Figs are good for eye sight²⁹.

Recently, some beneficial effects of fig tree (*Ficus carica*) leaf extract has been argued^{30,31} having therapeutic benefits in cases of hyperglycemia³², cancer³³, helminth infection³⁴, hypercholesterolemia³⁵, hypertriglyceridemia³⁶ and bovine papillomatosis³⁷. The latex is widely applied on warts, skin ulcers and sores and taken as a purgative and vermifuge, but

with considerable risk²⁷. Medicinal uses of *Ficus carica* have been summarized in the Table-2.

Scientific miracle of the holy Quran

Metallothionein (MT): Metallothionein is a Sulfur containing protein which can easily bind with zinc, iron and phosphorus. It is produced in small quantity in the brains of humans and animals. It is considered very important to human

TABLE-2
MEDICINAL USES OF COMMON FIG (*Ficus carica*)

| Diseases | Part used | Treatment | Ref. |
|-----------------------------------|-----------|--|------|
| Anemia | Fruit | Figs contain iron which enriches the blood, and helps to produce it. Dried figs give about 3.0 mg of iron for every 100 g. They are ideal for women, girls and those suffering from Anemia. | 40 |
| Asthma | Fruit | Syrup made from methi seeds, figs and honey is very effective in bronchial asthma. | 8 |
| Blood pressure | Fruit | Figs are a good source of potassium. They lower Cholesterol and are useful for those with high blood pressure. People who eat potassium-rich foods tend to have lower blood pressure. | 29 |
| Bronchitis | Fruit | A quarter of a liter of boiled milk with 12 dry figs for ¼ of an hour. Drink the liquid once strained and sweetened. | 80 |
| Cancer | Fruit | Figs are used for the treatment of cancer in Japan. About twenty kinds of cancer has been treated with figs. | 8 |
| | | In USA fresh fruit is used for the treatment of cancer. | 80 |
| | | The fig compound angelicin, has been recommended currently for the treatment of skin cancer. | 9 |
| Chills | Fruit | Figs are also recommended in the treatment of chills. | 8 |
| Colics | Fruit | It is useful in colics and is a good diuretic. | 8 |
| Constipation | Fruit | Decoction of dry figs is useful. Boil 3 dry figs in water for ¼ an hour. Leave to rest and drink the liquid and eat the figs the following morning | 85 |
| Diabetes | Leaf | The leaf decoction is taken as a remedy for diabetes. | 27 |
| Digestion | | To eat five figs is excellent in aiding digestion and improving the condition of the stomach and bowels. | 29 |
| Eye sight | Fruit | Figs are good for eye sight. Eating three or more servings of the fruit per day lowers the risk of age-related macular degeneration (ARMD). | 29 |
| Galactagogue | Fruit | The unripe green fruits are cooked with other foods as a galactagogue and tonic | 28 |
| Gumboils, Dental abscesses | Fruit | The roasted fruit is emollient and used as a poultice in the treatment of Gum boils, dental abscesses etc. | 28 |
| Hemorrhoids | Fruit | The Holy Prophet Muhammad PBUH is recorded to have said to make use of figs in order to curb Hemorrhoids. | 6 |
| Insects bites | Latex | In Turkey scorpion bite and bee sting are treated by applying externally the fresh latex of stem. | 80 |
| | | The application of the latex of the leaves are also useful for scorpion & bee stings. | 85 |
| Insomnia | | Figs contain a nutrient called tryptophan. This promotes good sleep and helps the brain use glucose properly, encouraging and stimulating good circulation | 40 |
| Intestinal obstruction | Fruit | It clears the intestinal obstruction, as if has laxative, anti-ulcer and antibacterial powers. | 8 |
| Kidney and urinary bladder stones | Fruit | It can dissolve and expel kidney and urinary bladder stones, and can help patients suffering from kidney failure and patients who has had a kidney transplant. | 29 |
| | | It can clear the obstruction of liver and gall-bladder and relieves inflammations of kidney and urinary bladder | 8 |
| Mouth disorders | | For the treatment of the mouth disorders (Inflammation, wounds etc.) decoction of dry figs is advantageous. Boil 3 dry figs in water for ¼ an hour. Leave to rest and drink the liquid and eat the figs the following morning. | 85 |
| | | During fevers, if it is chewed, the patient feels relief from the dryness of mouth. | 8 |
| Osteoporosis | Fruit | Figs, rich in calcium, play a very important role in the development of bones. They are invaluable for those suffering from osteoporosis and brittle bones. | 29 |
| Skin ulcers | Latex | The latex is widely applied on externally. | 27 |
| Sores | Latex | The latex is widely applied on externally. | 27 |
| Stress | Fruit | There are many causes of physical and emotional stresses. Figs are extremely nutritious, and over-all an ideal fruit to overcome stresses and anxieties. | 29 |
| Sore throat | Fruit | In Latin America, figs are much employed as folk remedies. A decoction of the fruits is gargled to relieve sore throat. | 27 |
| Swollen gums | Fruit | In Latin America figs boiled in milk are repeatedly packed against swollen gums. | 27 |
| To lose weight | Fruit | Figs are ideal for those trying to lose weight. It contains the digestive enzymes for all the three components of diet: Proteins, carbohydrates and fat. | 8 |
| Toothache | Latex | The latex soaked cotton is placed in the cavity of the affected tooth for the treatment of toothache. | 10 |
| Tumor | Fruit | In Latin America the fruits are much used as poultices on tumors and other abnormal growths. | 27 |
| | | According to Japanese tests, figs and the fig syrup (benzaldehyde) have helped shrink tumors. | 8 |
| Warts | Latex | In Italy and Turkey and Tunisia the latex is externally applied on the warts several times daily. | 80 |
| | Fruit | In France fresh fruit juice is externally applied on warts. | 80 |

beings by playing vital role in reducing cholesterol, performing metabolism, strengthening the heart and controlling breath. Its production level decreases after the age of 35 years and stops at the age of 60 years. So it is not easy to obtain metallothionein from human. Scientists, therefore, targeted plants for this purpose. A team of Japanese scientists found this magical substance, metallothionein only in two plant species: fig and olive. They found that the use of metallothionein extracted from fig or olive alone did not give the expected beneficial result for human health. The useful results were achieved only when the mixture of metallothionein extracted from both the plants was used. The team tried to find the best mix ratio between fig and olive that provides the best influence. The best mix ratio was found to be 1:7 (1 fig to 7 olive).

In holy Quran the fig has been mentioned only once while the olive seven times (six times explicitly and one time implicitly). The information gathered from the holy Quran were sent to the team of Japanese scientists. After verifying that the discovered information were mentioned in the holy Qur'an 1427 years ago, the President of the Japan Research team declared to accept Islam³⁸.

Phytochemistry

Phytochemical investigation of *Ficus carica* was undertaken and led to the identification of over 100 compounds, summarized in Table-3. Several coumarins were isolated from it. Multiple flavonoids have been identified from its stem, leaves and roots. Also prominent were triterpenoids from the roots, leaves and the latex.

Phytochemical studies revealed the presence of numerous bioactive compounds: arabinose, β -amyryns, β -carotenes, glycosides, β -setosterols and xanthotoxol³⁹.

Carbohydrate: Figs are high-carbohydrate food and an extraordinarily good source of dietary fiber. Ninety-two per cent of the carbohydrates in dried figs are glucose, fructose and sucrose. The rest is dietary fiber, insoluble cellulose in the skin, soluble pectin in fruit.

Mineral contents of figs closely resembles that of human milk. The most important mineral in dried figs is iron. Figs have about 50 % as much iron as beef liver. Calcium and potassium are also present⁴⁰.

Lipids: Various lipid compounds have been identified from the fruit of the fig tree. The main groups are triacylglycerols, free and esterified sterols, mono- and digalactosyl diglycerides, ceramide oligosides, cerebrosides, esterified sterol glycosides and phosphatidyl glycerols⁴¹. Fatty acids in fig fruit, determined were myristic acid, palmitic acid, stearic acid, oleic acid, linoleic acid and linolenic acid^{5,27,42}. Dried seeds have also been found to contain fixed oil²⁷. Sitosterol was the most predominant sterol in all parts of fig. Campesterol, stigmasterol and fucosterol were also detected⁴². A mixture of 6-O-acyl- β -D-glucosyl- β -sitosterols, the acyl moiety being primarily palmitoyl and linoleyl with minor amounts of stearyl and oleyl, has been isolated from fig (*Ficus carica*) latex and soybeans⁴³.

Phenolics: The analyzed phenolics present at the highest content were rutin, followed by (+)-catechin, chlorogenic acid, (-)-epicatechin, gallic acid and finally, syringic acid⁴⁴.

Coumarins: Besides their ubiquitous polyphenols, figs have other compounds, specifically benzaldehyde and the

coumarins, furocoumarins including angelicin, marmesin, psoralen, umbelliferone and bergapten⁹. Fruits of the dark-coloured Mission variety fig contain the highest levels of polyphenols, flavonoids and anthocyanins, having cyanidin-3-O-rhamnoglucoside (cyanidin-3-O-rutinoside; C3R) as the main anthocyanin⁴⁵.

Enzyme: The latex contains enzymes such as ficin, proteases, lipodiastases, amylase, proteolytic enzymes: diastase, esterase, lipase, catalase and peroxidase²⁷. The Fig fruit contains, tyrosin, cravin, lipase, protease⁴¹.

Flavonoids: The major flavonoid contents of leaf extracts from *Ficus carica* was found to be quercetin and luteolin⁴⁶.

Five triterpenoids newly isolated from the leaves of *Ficus carica* investigated by open mouse ear assay. Total methanolic extract, calotropenyl acetate, methyl maslinate and lupeol acetate showed potent and persistent irritant effects⁴⁷.

The chemical constituents of *Ficus carica* cited in various literatures have been listed in the Table-3.

Pharmacological activities

Ficus carica has been reported to exhibit antioxidant, anti-HSV, Haemostatic, hypoglycemic, hypo-lipidemic activities, antispasmodic and anti-platelet activities. The 6-O-acyl- β -D-glucosyl- β -sitosterols along with its palmitoyl, linoleyl, stearyl and oleyl derivatives isolated from the fruit of *Ficus carica* exhibited strong cytotoxic effect²⁶.

Anticancer activity: Besides their polyphenols, figs have other compounds with anticancer activity, specifically benzaldehyde and the coumarins. Benzaldehyde has been used successfully to treat terminal human carcinomas. Treatment of squamous cell carcinomas with benzaldehyde induced the cancer cells to change into keratinized, normal squamous cells. Coumarins, isolated from the volatile extract of fig have also been used for the treatment of prostate cancer. The fig compound angelicin are currently being investigated for the treatment of skin cancer and have been recommended for clinical trials because they have low skin phototoxicity⁹.

The extracts from latex of *Ficus carica* was found to have the highest *in vivo* antitumor activities, using At PDT bioassay (Agrobacterium tumefaciens Potato Disc Tumor bioassay)⁴⁸. A mixture of acyl moiety with minor amounts of stearyl and oleyl, isolated from fig (*Ficus carica*) latex and soybeans have been shown *in vitro* inhibitory effects on proliferation of various cancer cell lines⁴³.

Antioxidant: The extract prepared from the leaves of *Ficus carica* L. was evaluated for α -tocopherol content, total flavonoid and total phenol content and were investigated for antioxidant capacities. The results visibly confirmed that these extracts have antioxidant capacity, which are consistent with total flavonoid and phenol contents⁴⁹.

In another study, fruits of different varieties of fig were analyzed for polyphenols and anthocyanins contents. It was found that dark-coloured Mission variety contained the highest levels of polyphenols, flavonoids and anthocyanins than red Brown-Turkey variety, exhibiting the highest antioxidant capacity which is correlated well with the amounts of polyphenols and anthocyanin⁴⁵.

Hepatoprotective activity: The methanol extract of the leaves of *Ficus carica* was evaluated for hepatoprotective

TABLE-3
CHEMICAL CONSTITUENTS OF FIG (*Ficus carica*) COLLECTED FROM VARIOUS LITERATURE

| Name of the comp. | m.f. | Class | Parts | Ref. |
|---|---|-------------------|----------------|-------|
| Adrenaline | C ₉ H ₁₃ NO ₃ | Neurotransmitter | – | 78 |
| Aflatoxin B ₁ | C ₁₇ H ₁₂ O ₆ | Mycotoxin | Fruit | 78,79 |
| Aflatoxin B ₂ | C ₁₇ H ₁₄ O ₆ | Mycotoxin | Fruit | 78,79 |
| Aflatoxin G ₁ | C ₁₇ H ₁₂ O ₇ | Mycotoxin | Fruit | 78,79 |
| Aflatoxin G ₂ | C ₁₇ H ₁₄ O ₇ | Mycotoxin | Fruit | 78,79 |
| Alanine | C ₃ H ₇ NO ₂ | Amino acid | Fruit | 39,78 |
| Amylase | – | Enzyme | Latex | 26 |
| β-Amyrin | C ₃₀ H ₅₀ O | Triterpene | Leaf | 39,78 |
| Apigenin-glycosides | – | Glycoside | Fruit | 39 |
| Angelicin | C ₁₁ H ₆ O ₃ | Coumarin | Fruit | 9,78 |
| Arabinose | C ₅ H ₁₀ O ₅ | Aldopentose | Fruit | 39,78 |
| Arachidic acid | C ₂₀ H ₄₀ O ₂ | Fatty acid | Fruit | 39 |
| Arginine | C ₆ H ₁₄ N ₄ O ₂ | Amino acid | Fruit | 39,78 |
| Ascorbic Acid | C ₆ H ₈ O ₆ | Vitamin | Leaf and Fruit | 39,78 |
| Aspartic acid | C ₄ H ₇ NO ₄ | Amino acid | Fruit | 39,78 |
| Azinphos-methyl | C ₁₀ H ₁₂ N ₃ O ₃ PS ₂ | Insecticide | – | 78 |
| Baurenol | C ₃₀ H ₅₀ O | Sterol | Leaf | 80 |
| Benzaldehyde | C ₇ H ₆ O | Aromatic aldehyde | Fruit | 81 |
| Bergapten | C ₁₂ H ₈ O ₄ | Coumarin | Leaf | 80 |
| Cadalene | C ₁₅ H ₁₈ | Hydrocarbon | Leaf | 39,78 |
| Calcium | Ca | Mineral | Leaf and Fruit | 78 |
| Caltrophenyl acetate | C ₃₂ H ₅₂ O ₂ | Triterpenoid | Leaf | 50,82 |
| Campesterol | C ₂₈ H ₄₈ O | Sterol | Plant | 50 |
| 5-Carboxypyranocyanidin-3-rutinoside | – | Anthocyanin | Fruit | 83 |
| β-Carotene | C ₄₀ H ₅₆ | Tetraterpenoid | Fruit | 39 |
| γ-Carotene | C ₄₀ H ₅₆ | Tetraterpenoid | Fruit | 78,81 |
| (+)-catechin | C ₁₅ H ₁₄ O ₆ | Flavonoid | Fruit | 44 |
| Catalase | – | Enzyme | Latex | 27 |
| Cerin | – | Latex | Plant | 78 |
| Ceramide oligosides, | – | Lipid | Fruit | 41 |
| Cerebrosides, | – | – | Fruit | 41 |
| Chlorogenic acid | C ₁₆ H ₁₈ O ₉ | Phenolic | Fruit | 44 |
| Citric acid | C ₆ H ₈ O ₇ | Organic acid | Latex, Fruit | 39,84 |
| Carotenoids | – | Pigment | Leaf | 81 |
| Caoutchouc | – | Latex | Leaf | 39,78 |
| Copper | Cu | Mineral | Fruit | 39 |
| Cyanidin-3,5-diglucoside | C ₂₇ H ₃₁ O ₁₆ Cl | Anthocyanin | Fruit | 78,81 |
| Cyanidin-3-monoglucoside | – | Anthocyanin | Fruit | 78,81 |
| Cyanidin-3-rhamnoglucoside | C ₂₇ H ₃₁ O ₁₅ | Anthocyanin | Fruit | 78,81 |
| Cyanidin-3-rutinoside | – | Anthocyanin | Fruit | 83 |
| 9,19-cycloarlane | – | Terpenoid | Leaf | 50 |
| p-Cymene | C ₁₀ H ₁₄ | Hydrocarbon | Leaf | 39,78 |
| Cystine | C ₆ H ₁₂ N ₂ O ₄ S ₂ | Amino acid | Fruit | 39 |
| (E)-2-Decenal | C ₁₀ H ₁₈ O | Aldehyde | – | 78 |
| Diastase | – | Enzyme | Latex | 39,27 |
| Digalactosyl diglycerides | – | Lipid | Fruit | 41 |
| 4',5'-Dihydroxy-psoralen | – | Coumarin | Leaf | 80 |
| Dopamine | C ₈ H ₁₁ NO ₂ | Neurotransmitter | – | 78 |
| Endo-B-N-acetylglucosaminidase | – | Enzyme | – | 81 |
| (-)-epicatechin | C ₁₅ H ₁₄ O ₆ | Phenolic compound | Fruit | 44 |
| Epirutin | – | Flavonoid | – | 78,81 |
| Esterase | – | Enzyme | Latex | 39,81 |
| Ficin | – | Enzyme | Latex | 81 |
| Ficusin | C ₁₁ H ₆ O ₃ | Latex | Leaf | 39,78 |
| Ficusogenin | C ₂₇ H ₄₄ O ₅ | Triterpenoid | Leaf | 39,80 |
| Ferulic acid | C ₁₀ H ₁₀ O ₄ | Phenol | Plant | 39 |
| Fixed oil | – | Lipid | Seed | 27 |
| Fructose | C ₆ H ₁₂ O ₆ | Carbohydrate | Fruit | 39,40 |
| Fucosterol | C ₂₉ H ₄₈ O | Sterol | Plant | 50 |
| Fumaric acid | C ₄ H ₄ O ₄ | Organic acid | Latex, Fruit | 39,84 |
| Furocoumarinic acid-O-β-D-furmglycoside | C ₁₇ H ₁₈ O ₉ | – | – | 78 |
| Gallic acid | C ₇ H ₆ O ₅ | Organic acid | Fruit | 44 |
| Glucose | C ₆ H ₁₂ O ₆ | Carbohydrate | Fruit | 40,78 |

| | | | | |
|---|---|-----------------------|-----------------|-------|
| Germacrene D | C ₁₅ H ₁₄ | Sesquiterpenes | – | 78,81 |
| Guaiacol | C ₇ H ₈ O ₂ | Aromatic oil | Leaf | 39,78 |
| Galactose | C ₆ H ₁₂ O ₆ | Carbohydrate | Leaf | 39,78 |
| Galacturonic acid | C ₆ H ₁₀ O ₇ | Monobasic acid | Leaf | 39,78 |
| Glutamic acid | C ₅ H ₉ O ₄ | Amino acid | Fruit | 39,78 |
| Glycine | C ₂ H ₃ NO ₂ | Amino acid | Fruit | 39,78 |
| Glycolipids | – | Lipid | Fruit | 41 |
| Glycoside | – | – | Fruit | 39 |
| Guaiazulone: | C ₁₅ H ₁₈ | Sesquiterpene | Root | 39,78 |
| (Z)-3-hexanol | – | Volatile oil | – | 81 |
| Z)-3-hexenyl acetate | – | Volatile oil | – | 81 |
| Histidine | C ₉ H ₆ N ₂ O ₃ | Amino acid | Fruit | 39,78 |
| Imperatorin | C ₁₆ H ₁₄ O ₄ | Furocoumarin | – | 78 |
| Iron | Fe | Mineral | Fruit | 39 |
| Isoimperatorin | C ₁₆ H ₁₄ O ₄ | Furocoumarin | – | 78 |
| Isoschaftoside | C ₂₆ H ₂₈ O ₁₄ | Coumarin | – | 78,81 |
| Isoleucine | C ₆ H ₁₃ NO ₂ | Amino acid | Fruit | 39,78 |
| Isoquercitrin | – | Flavonoid | Leaf | 80,81 |
| Isovaleric acid | C ₅ H ₁₀ O ₂ | Organic acid | – | 78 |
| Lupeol | C ₃₀ H ₅₀ O | Sterol | Leaf | 80 |
| Lupeol acetate | – | Triterpenoid | Leaf | 50,81 |
| Lutein | C ₄₀ H ₅₆ O ₂ | Pigment | Fruit | 39,81 |
| Linoleic acid | C ₁₈ H ₃₂ O ₂ | Fatty acid | Fruit | 27,39 |
| Linolenic acid | C ₁₈ H ₃₀ O ₂ | Fatty acid | Fruit | 27,39 |
| Lipase | – | Enzyme | Fruit and Latex | 27,39 |
| Lipodiastases | – | Enzyme | Latex | 26 |
| Leucine | C ₆ H ₁₃ NO ₂ | Amino acid | Fruit | 39,78 |
| Luteolin | C ₁₅ H ₁₀ O ₆ | Flavonoid | Leaf | 46 |
| Lysine | C ₆ H ₁₄ N ₂ O ₂ | Amino acid | Fruit | 39,78 |
| 3-Methylbutyl acetate | C ₇ H ₁₄ O ₂ | Ester | Fruit | 39,78 |
| Malic acid | C ₄ H ₆ O ₅ | Organic acid | Fruit and Leaf | 39,84 |
| Malonic acid | C ₃ H ₄ O ₄ | Dicarboxylic acid | Fruit | 39 |
| Magnesium | Mg | Mineral | Fruit | 39 |
| Manganese | Mn | Mineral | Fruit | 39 |
| Marmesin | C ₁₄ H ₁₄ O ₄ | Coumarin | Leaf | 9,80 |
| Methionine | C ₅ H ₁₁ NO ₂ S | Amino acid | Fruit | 39,78 |
| Manoheptulose | C ₇ H ₁₄ O ₇ | Carbohydrate | – | 78 |
| 24-Methylenecycloartanol | C ₃₁ H ₅₂ O | Sterol | Leaf | 80 |
| Methyl maslinate | – | Triterpenoid | Leaf | 47 |
| 6-(2-methoxy-Z-vinyl)-7-methyl-pyranocoumarin | – | Coumarin | Leaf | 50 |
| Methyl salicylate | C ₈ H ₈ O ₃ | Volatile analgesic | – | 81 |
| Myristic acid | C ₁₄ H ₂₈ O ₂ | Fatty acid | Fruit | 37,39 |
| Monogalactosyl diglycerideses | – | Lipid | Fruit | 41 |
| Neoxanthine | – | Carotenoid | Leaf | 39 |
| Neutral lipids | – | Lipid | Fruit | 41 |
| Niacin | C ₅ H ₄ NCO ₂ H | Vitamins | Fruit | 39 |
| Noradrenaline | C ₈ H ₁₁ NO ₃ | Neurotransmitter | – | 78 |
| Nonanoic acid | C ₉ H ₁₈ O ₂ | Lipid | – | 78 |
| Nonanal | C ₉ H ₁₈ O | Aldehyde | – | 78 |
| Oxypeucedenin hydrate | C ₁₇ H ₁₈ O ₆ | – | – | 78 |
| Oleic acid | C ₁₈ H ₃₄ O ₂ | Fatty acid | Fruit | 37,39 |
| Oleonolic acid | C ₃₀ H ₄₈ O ₃ | Fatty acid | Leaf | 81,82 |
| Octacosane | C ₂₈ H ₅₈ | Hydrocarbon | – | 78 |
| (E)-2-Octenal | C ₈ H ₁₄ O | Aldehyde | – | 78 |
| Octanoic acid | C ₈ H ₁₆ O ₂ | Fatty acid | – | 78 |
| Ochratoxin A | C ₂₀ H ₁₈ ClNO ₆ | Mycotoxin | – | 78 |
| Oxalic acid | C ₂ H ₂ O ₄ ·2H ₂ O | Organic acid | Latex, Fruit | 39,84 |
| Pantothenic acid | C ₉ H ₁₇ NO ₅ | VitaminB ₅ | Fruit | 39 |
| Pectin | – | Carbohydrate | Leaf and Fruit | 39,78 |
| <i>o</i> -Phenylphenol | C ₁₂ H ₁₀ O | Phenol | – | 78 |
| Pelargonadin-3-rhamnoglucosid | – | Triterpenoid | Fruit | 78,81 |
| Pentosan | – | Polysaccharide | Leaf and Fruit | 39 |
| Phenylalanine | C ₉ H ₁₁ NO ₂ | Amino acid | Fruit | 39 |
| 2-Phenylethanol | C ₈ H ₁₀ O | Alcohol | – | 78 |
| 2-Phenylethylacetate | C ₁₀ H ₁₂ O ₂ | Ester | – | 78 |
| Phospholipids | – | Lipid | Fruit | 41 |

| | | | | |
|---|---|------------------------|---------------|-------|
| Phosphorus | P | Mineral | Fruit | 39 |
| Phosphatidyl glycerols | – | Lipid | Fruit | 41 |
| Potassium | K | Mineral | Fruit | 39 |
| Propectin | – | Polysaccharide | Fruit | 78 |
| Protease | – | Enzyme | Fruit | 26 |
| Psoberan | C ₂₃ H ₁₄ O ₇ | Coumarin | Leaf | 78,81 |
| Psoralen | C ₁₁ H ₆ O ₃ | Coumarin | Leaf and Root | 80 |
| Pectose | – | Carbohydrate | Fruit | 78 |
| Peroxidase | – | Enzyme | Latex | 37,78 |
| Pyrrolidine carboxylic acid | C ₆ H ₁₁ NO ₂ | – | Fruit | 39,78 |
| Palmitic acid | C ₁₆ H ₃₂ O ₂ | Fatty acid | Fruit | 27,78 |
| Quercetin | C ₁₅ H ₁₀ O ₇ | Flavonoid | Leaf | 46,78 |
| Quinic acid | C ₇ H ₁₂ O ₆ | Organic acid | Latex | 39,84 |
| Raffinose | C ₁₈ H ₃₂ O ₁₆ | Carbohydrate | – | 78 |
| Resin | – | Latex | Plant | 78 |
| Riboflavin | C ₁₇ H ₂₀ N ₄ O ₆ | Vitamin | Fruit | 39 |
| Rutin | C ₂₇ H ₃₀ O ₁₆ | Flavonoid | Leaf | 80 |
| Rhamnose | C ₆ H ₁₂ O ₅ | Carbohydrate | Leaf | 39,78 |
| β-Sitosterol | C ₂₉ H ₅₀ O | Sterol | Leaf and Root | 80 |
| Sucrose | C ₁₂ H ₂₂ O ₁₁ | Carbohydrate | Fruit | 40,78 |
| Sapogenin | – | – | Leaf | 82 |
| Serine | C ₃ H ₇ NO ₃ | Amino acid | Fruit | 39 |
| Serotonin | C ₁₂ H ₁₀ N ₂ O | Monoamine | – | 78 |
| Stachyose | C ₂₄ H ₄₂ O ₂₁ | Carbohydrate | – | 78 |
| Stigmasterol | C ₂₉ H ₄₈ O | Sterol | Plant | 50 |
| Scopoletin | C ₁₀ H ₈ O ₄ | Coumarin | – | 78,81 |
| Schaftoside | C ₂₆ H ₂₈ O ₁₄ | Glycoside | Fruit | 39,78 |
| Shikimic acid | C ₇ H ₁₀ O ₅ | Organic acid | Latex | 78 |
| Sedoheptulose | C ₇ H ₁₄ O ₇ | Carbohydrate | – | 78 |
| Sodium | Na | Mineral | Fruit | 39 |
| Stearic acid | C ₁₈ H ₃₆ O ₂ | Fatty acid | Fruit | 37,39 |
| Syringic acid | C ₉ H ₁₀ O ₅ | Phenolic | Fruit | 44 |
| Tricosane | C ₂₃ H ₄₈ | Hydrocarbon | – | 78 |
| Tetracosane | C ₂₄ H ₅₀ | Hydrocarbon | – | 78 |
| ψ-Taraxasterol | C ₃₀ H ₅₀ O | Sterol | Leaf | 78,82 |
| ψ-Taraxasteryl ester | – | Sterol | Leaf | 80 |
| Thiamin | C ₁₂ H ₁₇ N ₄ O ₅ | Vitamin B ₁ | Fruit | 39 |
| Threonine | C ₄ H ₉ NO ₃ | Amino acid | Fruit | 39,78 |
| Tryptophan | C ₁₁ H ₁₂ N ₂ O ₂ | Amino acid | Fruit | 39,78 |
| Tyrosine | C ₉ H ₁₁ NO ₃ | Amino acid | Fruit | 39 |
| Umbelliferone | C ₉ H ₆ O ₃ | Coumarin | Leaf | 80 |
| Violaxanthin | C ₄₀ H ₅₆ O ₄ | Pigment | Fruit | 39,78 |
| Valine | C ₅ H ₁₁ NO ₂ | Amino acid | Fruit | 39,78 |
| Vitamin A | C ₂₀ H ₃₀ O | Vitamin | Fruit | 78 |
| Vitamin G | – | Vitamin | Fruit | 78 |
| Valeric acid | C ₅ H ₁₀ O ₂ | Fatty acid | – | 78 |
| Xanthitoxin | C ₁₂ H ₈ O ₄ | Coumarin | Leaf | 39,81 |
| Xanthotoxol | C ₁₁ H ₆ O ₄ | Coumarin | Leaf | 39,81 |
| Xylose | C ₅ H ₁₀ O ₅ | Monosaccharide | Leaf | 39,78 |
| Zinc | Zn | Mineral | Fruit | 39 |
| 6-O-acyl-β-D-glucosyl-β-sitosterol | | | Fruit | 50 |
| 6-O-linoleyl-β-D-glucosyl-β-sitosterol | | Latex | Fruit | 80 |
| 6-O-oleyl-β-D-glucosyl-β-sitosterol | | Latex | Fruit | 80 |
| 6-O-palmitoyl-β-D-glucosyl-β-sitosterol | | Latex | Fruit | 80 |
| 6-O-stearyl-β-D-glucosyl-β-sitosterol | | Latex | Fruit | 80 |

activity in rats. The extract at an oral dose of 500 mg/kg exhibited a significant protective effect by lowering the serum levels of aspartate aminotransferase, alanine aminotransferase, total serum bilirubin and malondialdehyde equivalent, an index of lipid peroxidation of the liver. These biochemical observations were supplemented by histopathological examination of liver sections. The activity of extract was also comparable to that of silymarin, a known hepatoprotective⁵⁰.

In another study liver slice culture model have been used to evaluate *in vitro* hepatoprotective activity of methanolic extract of leaves of *Ficus carica*. The cytotoxicity caused by CCl₄ was estimated by quantization the release of LDH in the medium. CCl₄ induces twice the amount release of LDH from the liver as compared to the cells from untreated liver tissue and this was significantly reduced in the presence of plant extract. The results clearly point out that *Ficus carica* leaves

extract mitigates the CCl₄ induced liver damage by decreasing LDH level⁵¹.

In another study, petroleum ether extracts of *Ficus carica* were tested for antihepatotoxic activity on rats treated with 50 mg/kg of rifampicin orally. The parameters assessed were serum levels of glutamic oxaloacetate transaminase, glutamic pyruvic transaminase, bilirubin and histological changes in liver. Liver weights and pentobarbitone sleeping time as a functional parameter were also monitored. There was significant reversal of biochemical, histological and functional changes induced by rifampicin treatment in rats by petroleum ether extract treatment, indicating promising hepatoprotective activity⁵².

Antidiabetic effect: The antidiabetic effects of *Ficus carica* leaf extracts have been reported previously. The aqueous decoction of fig leaves has caused decline in the levels of total cholesterol and a decrease in the total cholesterol/HDL cholesterol ratio (with respect to the control group), together with a reduction of the hyperglycaemia in rats³⁵.

The effect of decoction of leaves of *Ficus carica* as a supplement to breakfast, was studied in insulin-dependent diabetes mellitus (IDDM) patients. Post-prandial glycaemia was lower during supplementation with *Ficus carica* and without pre-prandial differences. It was concluded that the addition of *Ficus carica* to diet in insulin-dependent diabetes mellitus could help to control postprandial glycaemia³².

In another study to investigate the hypoglycaemic activity of *Ficus carica* leaf aqueous extract, was administered to rats in lieu of drinking water for 3 weeks. The extract decreased ($p < 0.025$) plasma glucose in diabetic while not in normal rats. Plasma insulin levels were decreased by treatment ($p < 0.05$) in non-diabetic rats. Lactate released was lower in untreated diabetic *vs.* untreated non-diabetic rats. Thus, *Ficus carica* extract showed a clear hypoglycaemic effect in diabetic rats. Such an effect cannot be mediated by an enhanced insulin secretion, so as yet undefined insulin-like peripheral effect, may be suggested³⁶.

Inflammatory effect: An aqueous-ethanolic extract of *Ficus carica* was studied for antispasmodic effect on the isolated rabbit jejunum preparations and for antiplatelet effect using *ex vivo* model of human platelets. When tested in isolated rabbit jejunum, *Ficus carica* (0.1-3.0 mg/mL) produced relaxation of spontaneous and low K(+) (25 mM)-induced contractions with negligible effect on high K(+) (80 mM) similar to that caused by cromakalim. *Ficus carica* (0.6 and 0.12 mg/mL) inhibited the adenosine 5'-diphosphate and adrenaline-induced human platelet aggregation. This study showed the presence of spasmolytic activity in the ripe dried fruit of *Ficus carica* possibly mediated through the activation of K(+) (ATP) channels along with antiplatelet activity which provides sound pharmacological basis for its medicinal use in the gut motility and inflammatory disorders²⁶.

Antibacterial activity: Both in *in vitro* and *in vivo* tests, aqueous extract from *Ficus carica* fruit reduces the survival and the damages (disease incidence and disease severity) caused by bacterial pathogens of kiwifruit (*Pseudomonas syringae* pv. *Sy ringae*, *Pseudomonas viridiflava*) and of tomato (*Pseudomonas syringae* pv. *tomato*) plants. The

extract shows *in vitro* antimicrobial activity, against all bacterial strains utilized at different concentrations (10^6 - 10^8 cfu mL⁻¹). *In vivo* tests *Ficus carica* extracts confirm their antimicrobial activity on *Pseudomonas syringae* pv. *tomato*, reducing DI and DS after 2 week until to 60 % and 67 % to 32 % and 22 %, respectively⁵³.

Antifungal activity: *Ficus carica* has also been evaluated for antifungal activities. In one study a low-molecular-weight protein, isolated from freshly collected latex of the *Ficus carica* was found to possess antifungal activity⁵⁴.

Antiviral activity: The antiviral activity of the *F. carica* leaf extract was evaluated in Hep-2, BHK₂₁ and CEF human cell lines which showed a significant inhibitory activity with MTC value 0.5 mg/mL, against Newcastle disease virus (NDV). The leaf extracts with ethanol and water recorded TDO values of 55 and 50 mg/mL and TI values of 1100 and 100, respectively. The results suggested that the extract from *F. carica* leaves had significant activity against NDV and may have applications in drug preparation⁵⁵.

In other study the extract from the leaves of *Ficus carica* was tested for its anti-virus effects on Hep-2, BHK₂₁ and PRK cells. The water extract from the leaves of *Ficus carica* possessed distinct anti-HSV-1 effect. It possessed low toxicity and directly killing-virus effect on HSV-1. The leaves of *Ficus carica* possess anti-HSV-1 effect and their application on the area of medicine, food and drugs has expensive foreground⁵⁶.

Effect on secretion and contents of cholesterol: Leaves of *Ficus carica* were dried, powdered and extracted using methanol. *Ficus carica* leaf on the secretion and cell content of cholesterol in HepG2 cells were studied. Extracts were added to the media in both basal and glucose stimulated conditions and incubated for 48 h. While glucose significantly increased cholesterol secretion (17 ± 0.76 mg dL⁻¹) *vs.* basal condition (6.91 ± 0.66 mg dL⁻¹), co-incubation with extracts reduced secretion of cholesterol in many concentrations of the stimulated condition. On the other hand, cholesterol content of HepG2 in glucose stimulated condition (2.73 ± 0.39 mg dL⁻¹) showed significant increase compared to the basal status (1.96 ± 0.14 mg dL⁻¹) ($p < 0.001$). Moreover such decrease was shown in response to many concentrations of the extracts. These properties making the hydro-extracts of fig leaf a potentially safe intervention to modulate postprandial hyperlipidemia⁵⁷.

The results showed that all aqueous extracts can significantly decrease ($p < 0.001$) secretion of cholesterol from the liver cell in both stimulated and basal condition which is resemble to the diabetic animals. These findings are in good agreement with other findings^{35,58,59}. However, Future studies will need to examine the mechanism of different FTE effects on the basal and glucose induced lipid changes to deduce if the effect is due to altered *de novo* cholesterol synthesis or increased catabolism of cholesterol. In conclusion these preliminary data suggest that hydroextract of fig leaf administration may be an alternative method to reduce hyperlipidemia, particularly postprandially induced ones⁵⁷.

The ease with which adipose tissue takes up VLDL-TG is the major contributor to fattening of the rooster Hermier showed that plasma VLDL-TG of obese roosters was twice

that of lean roosters. The VLDL-TG in plasma comes from hepatic lipogenesis. Despite knowing the deleterious effects of hepatic lipogenesis, very little is known about the physiological and pharmacological agents mediating the synthesis and secretion of lipids, apolipoproteins and VLDL-assembly and secretion in avian species.

Another study was designed to investigate the possible effect of the fig tree leaves (FTE), on hepatic triglyceride (TG) content and secretion of triglyceride and cholesterol (TC) from the liver of 8 week-old roosters. After administration it was found that fig tree leaf extract drastically reduced these effects to the basal levels in a concentration-dependent manner ($p < 0.001$). We have shown for the first time that fig tree leaf extract can have a novel effect on both the insulin induced triglyceride hepatic storage and insulin induced VLDL-TG secretion *in vitro*. It is suggested that *Ficus carica* leaf extract could be a beneficial supplement to modulate triglyceride and cholesterol secretion from the poultry liver. Interestingly, the decrease in triglyceride secretion observed in the fig tree leaf extract treatment was concurrent with decreases in cell triglyceride content and cholesterol secretion. In agreement with our findings, Canal *et al.*³⁵ showed that chloroform extract of *Ficus carica* leaves led to a decline in the levels of total cholesterol and total cholesterol/HDL cholesterol ratio in hypercholesterolemic streptozotocin induced diabetic rats. In this respect, Perez *et al.*³⁶ showed while a *Ficus carica* leaf decoction decreased serum triglyceride values of hypertriglyceridemic rats, it had no effect on cholesterol levels. The mechanism of the effect of fig tree leaf extract on the hepatic lipid is presently unclear⁶⁰.

Irritant potential of triterpenoids from *Ficus carica* leaves: The irritant potential of total methanolic extract and five triterpenoids newly isolated from the leaves of *Ficus carica* were investigated by open mouse ear assay. Total methanolic extract, calotropenyl acetate, methyl maslinate and lupeol acetate showed potent and persistent irritant effects⁴⁷.

Antiwart activity: A traditional method for the treatment of warts in some rural areas of Iran comprises the use of fig tree (*Ficus carica*) latex as a local treatment. However, there is no scientific evaluation of its efficacy. A prospective, open right/left comparative trial of fig tree latex therapy vs. local standard of cryotherapy was carried out. Twenty-five patients with common warts were recruited into the study from an outpatient clinic. The patients were instructed in self-application of fig tree latex to warts on one side of the body. The wart on the opposite side was treated using standard cryotherapy. A 6-month follow-up study was planned. In 11 (44%) of the 25 patients complete resolution of fig tree latex-treated warts was observed. The remaining 14 patients (56%) had a complete cure following cryotherapy. Two patients had complete remission on both sides. Two patients failed to respond to either cryotherapy or fig tree latex. It was found that fig tree latex therapy was marginally less effective than cryotherapy. Adverse effects were observed only in cryo-treated warts. At the 6 month follow-up study there was an 18% recurrence rate. Fig tree latex therapy of warts offers several beneficial effects including short-duration therapy, no reports of any side-effects, ease-of-use, patient compliance and a low recurrence rate. The exact

mechanism of the antiwart activity of fig tree latex is unclear but is likely to be the result of the proteolytic activity of the latex enzymes⁶¹.

Antimutagenic activity: Antimutagen activity and high efficiency of antimutagen action of plant extracts from horse-radish roots (*Armoracia rusticana*), fig branches (*Ficus carica*) and mays seedlings (*Zea mays*) and their ability to decrease the frequency of spontaneous and induced by γ -rays chromosome aberrations in meristematic cells of *Vicia faba* and marrow cells of mice have been shown. Comparative assessment of genoprotective properties of peroxidase and the studied extracts has revealed higher efficiency of antimutagen action of peroxidase⁶².

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