

Pharmacological and Medicinal Aspects of the Verses Containing Fig (At-tin) in Holy Quran

Maryam Rameshrad^{1,2}, Negisa Seyed Toutounchi², Solmaz Maleki Dizaj^{3*}

1 Department of Pharmacology and Toxicology, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran

2 Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran

3 Department of Pharmaceutical Nanotechnology, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract

Background and Objectives: Holy Quran, the last religious reference book, describes the importance of various plants in different chapters (Sura). Herbs have always been the principal form of traditional medicine in some countries. In this review article, the authors attempted to describe the impact of one of the Quranic plants (fig) from medicinal aspects.

Methods: This is a review article that was conducted using verses, regarding At-tin, which were gathered from Holy Quran and internet database. The electronic search of the scientific literature was mainly conducted on 'PubMed'.

Results: One chapter of Holy Quran has been named "At-tin", which shows the importance of this fruit. Pharmacological aspects of fig, both in traditional and modern medicine, prove its benefits in many disorders. Different parts of this plant have been used to treat various disorders such as infections, diabetes, gastric problems, inflammation, and cancer. Among the various medical uses of fig, anticancer activity has the most considerable effect. Scientists of the current century have just realized some properties and applications of fig in medicine.

Conclusion: Fourteen centuries ago, Holy Quran indicated the importance of "Fig" by nominating one chapter of Holy Quran in "At-tin". It is one of the miracles of Holy Quran. Altogether, further studies are recommended to be carried out especially on origin of Islamic medicine in Holy Quran and its concordance with modern medicine.

Keywords: Holy Quran, At-tin, Ficus, Pharmacology, Medicine, Anti-proliferative, Antimicrobial.

***Correspondence:** Should be addressed to Solmaz Maleki Dizaj. **E-mail:** rameshm@tbzmed.ac.ir

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Introduction

Quran is one of the best reference books describing the importance of plants in different Surahs as in Al-Momeenoon, Al-Rehman, Al-Baqara and Al-Inaam (1).

Ficus is a genus of angiosperms (2) in the family of Moraceae (3) with more than 800 species (2).

According to C. C. Berg, two main groups of Ficus have been documented. Monoecious species comprises two subgroups (Pharmacosycea and Urostigma) and (gyno) dioecious species which include different subgroups (Ficus, Sycidium, and Sycomorus) (4, 5). This genus is an important genetic store because of its high commercial and dietary

values. It is a good source of food for fruit-eating animals in tropical areas (2, 6). Fig is a good source of carbohydrates, vitamins, minerals, and dietary fiber. This fruit has fat but is cholesterol free and contains a high number of amino acids (7-9).

Despite the importance of the medical plants in Holy Quran, there are few studies in this area to the best of authors' knowledge. Kahrizi and et al. have published a study regarding medical plants in Holy Quran in the American Journal of Scientific Research (1). Their research was a check list of medicinal plants and their uses enlisted in Holy Quran. In the present research, the authors will focus on the medicinal importance of "Fig" (At-tin).

Methods

This is a review article which was conducted using verses, regarding At-tin, gathered from Holy Quran. The electronic search of the literature was mainly conducted on 'PubMed' database with the following keywords: Holy Quran, At-tin, Ficus, Pharmacology, and Medicine. In addition, the reference lists of any paper counting as data were scanned to identify additional documents.

Results and Discussion

Phytochemical studies on Fig

Phytochemical studies on the leaves and fruits of the *F. carica* (common fig) have shown that it is rich in phenolics, organic acids, and volatile compounds (2). The further phytochemical investigation revealed different composition in the coumarin, fatty acid, polyphenol and flavonoid content (10). In a study on furanocoumarin content of *F. carica* wood and stem bark, psoralen and bergapten were two main coumarin compounds to be detected and their concentrations were higher in the wood than in the stem bark. Most of the dark fruited fig trees produce these two coumarins more than the green ones (11).

In a comparative study, six fig varieties differing in color (black, red, yellow, and green) were analyzed for their total polyphenols, flavonoids, antioxidant capacity and anthocyanin contents. Extracts of dark varieties showed higher contents of phytochemicals compared to light colored varieties. Fig peel

contained the highest amount of the above phytochemicals and antioxidant activity compared to the pulp (9).

Taxonomy (12):

Domain: Eukaryota

Kingdom: Plantae

Subkingdom: Viridiaeplantae

Phylum: Tracheophyta

Subphylum: Euphyllophytina

Infraphylum: Radiatopses

Class: Magnoliopsida

Subclass: Dilleniidae

Superorder: Urticales

Order: Urticales

Family: Moraceae

Tribe: Ficeae

Genus: Ficus

Fig in Holy Quran (13)

Quranic name of fig is "At-tin" which is mentioned in the first verse (Ayah) of a chapter (Sura) by this name. However, naming a chapter in holy Quran by "At-tin" could show the emphasis and importance of this fruit. Quran swears to fig: "by the fig and the olive ". (At-tin, verses 1).

Some traditional uses

Different parts of this plant have been used traditionally to treat various disorders such as infection (14), diabetes (14-18) gastric problems, inflammation (2, 14), and cancer (2), and that the usage is species-dependent. *F. religiosa* has been used in folk medicine for treatment of several illnesses including central nervous system, endocrine system, respiratory and reproductive system (19). *F. platyphylla* has been used in Nigerian traditional medicine for the management of epilepsy (20). *F. racemosa* Linn. has been used in Ayurveda, for a widespread of ailments including diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary diseases (21). *F. glomerata* Roxb. is another species which is used in Ayurveda to cure dysentery, menorrhagia, and hemoptysis (22).

Pharmacology and medicinal aspects

1-Hyperlipidemia

F. carica could be used in some metabolic diseases and abnormalities such as hyperlipidemia and diabetes.

For a scientific confirmation of the hypolipidemic activity of the fig studies on the preventive effects of a *F.carica* leaf extract on hyperlipidemia in high fat diet (HFD)-induced obese male rats, it was discovered that *F.carica* can significantly lower TG (23, 24) and IL-6 levels and elevate HDL cholesterol. Further researches also indicate that preventive treatment with *F.carica* significantly improves the lipid profile in HFD rats and increases HDL-C levels (24).

2-Diabetes

Studies on antidiabetic effects of *F.carica* revealed that its extract has a clear hypoglycaemic effect in diabetic rats and an undefined insulin-like peripheral effect is suggested as a probable mechanism (25).

Parameters related to oxidative stress were also studied on diabetic rats. *F.carica* extract tend to normalize the values of the diabetic animals' fatty acids and plasma vitamin E values (26). It was mentioned by Velaytham, R et al. that tannins from *F. racemosa* had a favorable effect on the lipid profile and plasma glucose in diabetic rats (27). Choo, CY et al. showed vitexin and isovitexin from the leaves of *F. deltoidea* reduced the postprandial blood glucose level due to α -glucosidase inhibition (15).

3-Gastrointestinal problem

F.carica paste is said to be effective in constipation. This effect of fig is studied on beagles with the results suggesting that fig paste can be useful as a complementary medicine in humans suffering from chronic constipation (28) while the other studies on the extracts of *F.bengalensis* (bark), *F. racemosa* (leaves) and *F. carica* (leaves) showed significant inhibitory activities against diarrhea in rats. However spasmolytic and anti-enteropooling properties of the extracts can be a probable mechanism. What's more, tannins and flavonoids present in the plant extracts may be responsible for the antidiarrheal activity (29).

4-Hepatoprotective effects

One of the main uses of fig is in hepatic diseases, which is traditionally known as a hepatoprotective herb; therefore, many studies have focused on this property. Hepatoprotective and antioxidant activities of methanol extract of

the bark of *F. glomerata* have been indicated (30). Hepatoprotective effects of methanolic extracts of *F.carica* and ethanolic leaf extract and stem extract were the subject of several studies. These studies prove that pretreatment with the *F.carica* extracts in methanol-induced (31) or carbon tetrachloride-induced (32, 33) hepatotoxicity in rats, shows significant hepatoprotective effects which can be due to its phenolic constituents (31-33). In addition, less liver fibrosis and inflammation were pronounced in pre-treatment with the extract (32). Similar studies in rats with hepatotoxicity induced by rifampicin also confirm the hepatoprotective effect of this plant (34).

5-Anti-proliferative effects

Among the various medical uses of fig, anticancer activity has the most considerable effect. Studies on *F.carica* fruit and leaf latex showed the best antiradical activity and anti-proliferative activity respectively on the human tumor cell line A375 (melanoma) after irradiation at a specific UVA dose (1.08 J/cm²) (35).

Moreover, in another study the anti-proliferative activity of fig tree latex on stomach cancer cell line was evaluated. Cancer cell line was more sensitive to *F. carica* latex than normal cells. The presence of its proteolytic enzymes can be responsible for this anticancer effect (36).

Some other studies showed that the anti-proliferative and antiradical activities of the plant collected in different months also differ. In a study on leaves, bark and woody part of *F. carica* collected in different months, their chemical composition, antioxidant activity and phototoxicity on C32 human melanoma cells after UVA irradiation were examined. The results showed that the second harvest of leaves and the first harvest of the bark had the highest antiradical activity. The third harvest of leaves showed the best inhibition of lipid peroxidation (37). Through some other studies it is proved that the leaves of *F.carica* show the best antioxidant and anti-proliferative activities in comparison with bark and wood parts (10). In addition, a mixture of 6-O-acyl- β -d-glucosyl- β -sitosterols as an effective cytotoxic agent from fig (*F. carica*) latex has inhibitory effects

on proliferation of various cancer cell lines (2, 38).

In another research, Sawadogo, W. R. et al. showed *F. platyphylla* has anti-trypanosomal effects invitro, which is a scientific evidence for its traditional usage as an antiparasitic herb (39).

6-CNS problems

One of the main functions of the figs, roots or stembark of *Ficus* species is in epilepsy. Studies showed that saponin's content in figs (12) and roots of *F. religiosa* (40, 41) or stembark of *F. platyphylla* has anticonvulsant effects (20). Though it was shown that serotonergic pathways are involved in anticonvulsant (41, 42) and anti-amnesic effect of *F. religiosa* (43) and membrane excitability damage could be the possible mechanism for anticonvulsant properties of *F. platyphylla* (20).

The stembark of *F. religiosa* is used in traditional medicine for treating cognitive decline, improving memory or related CNS activities. Recently, it was known that the extract of stembark of *F. religiosa* showed potent acetylcholinesterase inhibitor activity so that it could be effective in Alzheimer's disease (19).

7-Asthma

Two Indian research groups evaluated the anti-asthmatic activity of leaves and fruits of *F. religiosa* separately. The leaves were effective in bronchospasm (44, 45).

8-Antimicrobial, antiviral, and antifungal effects

The latex of fig fruit (*F. carica*) is used in traditional medicine for the cure of skin infections such as warts and also diseases of viral cause (46). Therefore, some studies suggest antimicrobial, antiviral, and antifungal effects for *F. carica* (47). In another study, it was shown that the water extract from the leaves of *F. carica* possesses distinct anti-HSV-1 effect (48).

9-Antiparasitic activity

The leaf extract of *F. carica* showed the strongest nematicidal activity among forty different plant species which have nematicidal activity (2, 49). This effect could be due to the plant cysteine proteinases (50, 51) or coumarin content (49). It was revealed that anthelmintic

activity of some species of *Ficus* could be the result of a proteolytic fraction called ficin (52).

According to the traditional medicine in India, *F. religiosa* can be effective in malarial fever (19, 53).

Conclusion

Considering the position of fig "At-tin" in Quran text, naming a chapter and swearing to it, *Ficus* becomes an important plant in Holy Quran. Pharmacology and medicinal aspects of this plant, both in folk and modern medicine, confirm the importance of *Ficus* as a beneficial gift from God to the mankind. "This is a reminder for men of understanding the God." (Az-Zumar Verse No:21)

According to the proven benefits of most of the fruits and medical herbs mentioned in Quran, further studies are recommended to be done on origin of Islamic medicine in Holy Quran and its agreement with modern medicine

Conflict of interest

The authors declare no conflict of interest.

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References

1. Kahrizi D, Molsaghi M, Faramarzi A, Yari K, Kazemi E, Farhadzadeh AM, et al. Medicinal plants in Holy Quran. *Am J Sci Res.* 2012;42:62-71.
2. Mawa S, Husain K, Jantan I. *Ficus carica* L. (Moraceae): phytochemistry, traditional uses and biological activities. *Evid Based Complement Alternat Med.* 2013;2013:8.
3. Sambamurty. AVSS. Taxonomy of angiosperms. India: I.K. International Pvt. Ltd; 2005. 533.
4. Berg CC. Classification and distribution of *Ficus*. *Experientia.* 1989;45(7):605-11.
5. Ronsted N, Weiblen GD, Savolainen V, Cook JM. Phylogeny, biogeography, and ecology of *Ficus* section *Malvanthera* (Moraceae). *Mol Phylogenet Evol.* 2008;48(1):12-22.
6. Rønsted N, Salvo G, Savolainen V. Biogeographical and phylogenetic origins of

- African fig species (Ficus section Galoglychia). *Mol Phylogenet Evol.* 2007;43(1):190-201.
7. Slatnar A, Klancar U, Stampar F, Veberic R. Effect of drying of figs (*Ficus carica* L.) on the contents of sugars, organic acids, and phenolic compounds. *J Agric Food Chem.* 2011;59(21):11696-702.
 8. Veberic R, Colaric M, Stampar F. Phenolic acids and flavonoids of fig fruit (*Ficus carica* L.) in the northern Mediterranean region. *Food Chemistry.* 2008;106(1):153-7.
 9. Solomon A, Golubowicz S, Yablowicz Z, Grossman S, Bergman M, Gottlieb HE, et al. Antioxidant activities and anthocyanin content of fresh fruits of common fig (*Ficus carica* L.). *J Agric Food Chem.* 2006;54(20):7717-23.
 10. Marrelli M, Statti GA, Tundis R, Menichini F, Conforti F. Fatty acids, coumarins and polyphenolic compounds of *Ficus carica* L. cv. Dottato: variation of bioactive compounds and biological activity of aerial parts. *Nat Prod Res.* 2013;28(4):271-4.
 11. Rouaiguia-Bouakkaz S, Amira-Guebailia H, Riviere C, Delaunay JC, Waffo-Teguo P, Merillon JM. Identification and quantification of furanocoumarins in stem bark and wood of eight Algerian varieties of *Ficus carica* by RP-HPLC-DAD and RP-HPLC-DAD-MS. *Nat Prod Commun.* 2013;8(4):485-6.
 12. Chandrasekar SB, Bhanumathy M, Pawar AT, Somasundaram T. Phytopharmacology of *Ficus religiosa*. *Pharmacogn Rev.* 2010;4(8):195-9. Epub 2010/07/01.
 13. At-tin. Holy Qur'an. Iran: Osve; 1992. p. 597.
 14. Farsi E, Shafaei A, Hor SY, Ahamed MB, Yam MF, Asmawi MZ, et al. Genotoxicity and acute and subchronic toxicity studies of a standardized methanolic extract of *Ficus deltoidea* leaves. *Clinics.* 2013;68(6):865-75.
 15. Choo CY, Sulong NY, Man F, Wong TW. Vitexin and isovitexin from the leaves of *Ficus deltoidea* with in-vivo alpha-glucosidase inhibition. *J Ethnopharmacol.* 2012;142(3):776-81.
 16. Ilyanie Y, Wong TW, Choo CY. Evaluation of hypoglycemic activity and toxicity profiles of the leaves of *Ficus deltoidea* in rodents. *J Complement Integr Med.* 2011;8(10):1553-3840.
 17. Adewole SO, Adenowo T, Naicker T, Ojewole JA. Hypoglycaemic and hypotensive effects of *Ficus exasperata* vahl. (Moraceae) leaf aqueous extract in rats. *Afr J Tradit Complement Altern Med.* 2011;8(3):275-83.
 18. Bhaskara Rao R, Murugesan T, Sinha S, Saha BP, Pal M, Mandal SC. Glucose lowering efficacy of *Ficus racemosa* bark extract in normal and alloxan diabetic rats. *Phytother Res.* 2002;16(6):590-2.
 19. Singh D, Singh B, Goel RK. Traditional uses, phytochemistry and pharmacology of *Ficus religiosa*: a review. *J Ethnopharmacol.* 2011;134(3):565-83. Epub 2011/02/08.
 20. Chindo BA, Anuka JA, McNeil L, Yaro AH, Adamu SS, Amos S, et al. Anticonvulsant properties of saponins from *Ficus platyphylla* stem bark. *Brain Res Bull.* 2009;78(6):276-82.
 21. Ahmed F, Urooj A. Traditional uses, medicinal properties, and phytopharmacology of *Ficus racemosa*: a review. *Pharm Biol.* 2010;48(6):672-81.
 22. Subhaktha PK, Rajasekaran R, Narayana A. Udumbara (*Ficus glomerata* Roxb.): a medico-historical review. *Bull Indian Inst Hist Med Hyderabad.* 2007;37(1):29-44.
 23. Perez C, Canal JR, Campillo JE, Romero A, Torres MD. Hypotriglyceridaemic activity of *Ficus carica* leaves in experimental hypertriglyceridaemic rats. *Phytother Res.* 1999;13(3):188-91.
 24. Joerin L, Kauschka M, Bonnländer B, Pischel I, Benedek B, Butterweck V. *Ficus carica* leaf extract modulates the lipid profile of rats fed with a high-fat diet through an Increase of HDL-C. *Phytother Res.* 2014;28(2):261-7.
 25. Perez C, Dominguez E, Canal JR, Campillo JE, Torres MD. Hypoglycaemic activity of an aqueous extract from *Ficus carica* (fig tree) leaves in streptozotocin diabetic rats. *Pharm Biol.* 2000;38(3):181-6.
 26. Perez C, Canal JR, Torres MD. Experimental diabetes treated with *Ficus carica* extract: effect on oxidative stress parameters. *Acta Diabetol.* 2003;40(1):3-8.
 27. Velayutham R, Sankaradoss N, Ahamed KF. Protective effect of tannins from *Ficus*

- racemosa in hypercholesterolemia and diabetes induced vascular tissue damage in rats. *Asian Pac J Trop Med.* 2012;5(5):367-73.
28. Oh H-G, Lee H-Y, Seo M-Y, Kang Y-R, Kim J-H, Park J-W, et al. Effects of *Ficus carica* paste on constipation induced by a high-protein feed and movement restriction in beagles. *Lab Anim Res.* 2011;27(4):275-81.
 29. Patil VV, Bhangale SC, Chaudhari KP, Kakade RT, Thakare VM, Bonde CG, et al. Evaluation of the antidiarrheal activity of the plant extracts of *Ficus* species. *Zhong Xi Yi Jie He Xue Bao.* 2012;10(3):347-52.
 30. Channabasavaraj K, Badami S, Bhojraj S. Hepatoprotective and antioxidant activity of methanol extract of *Ficus glomerata*. *J Nat Med.* 2008;62(3):379-83.
 31. Saoudi M, El Feki A. Protective role of *Ficus carica* stem extract against hepatic oxidative damage Induced by methanol in male wistar rats. *Evid Based Complement Alternat Med.* 2012;2012.
 32. Aghel N, Kalantari H, Rezazadeh S. Hepatoprotective effect of *Ficus carica* leaf extract on mice intoxicated with carbon tetrachloride. *Iran J Pharm Res.* 2011;10(1):63-8.
 33. Singab AN, Ayoub NA, Ali EN, Mostafa NM. Antioxidant and hepatoprotective activities of Egyptian moraceous plants against carbon tetrachloride-induced oxidative stress and liver damage in rats. *Pharm Biol.* 2010;48(11):1255-64.
 34. Gond NY, Khadabadi SS. Hepatoprotective activity of *Ficus carica* leaf extract on rifampicin-induced hepatic damage in rats. *Indian J Pharm Sci.* 2008;70(3):364-6.
 35. Menichini G, Alfano C, Provenzano E, Marrelli M, Statti GA, Somma F, et al. Fig latex (*Ficus carica* L. cultivar Dottato) in combination with UV irradiation decreases the viability of A375 melanoma cells in vitro. *Anticancer Agents Med Chem.* 2012;12(8):959-65.
 36. Hashemi SA, Abediankenari S, Ghasemi M, Azadbakht M, Yousefzadeh Y, Dehpour AA. The effect of fig tree latex (*Ficus carica*) on stomach cancer line. *Iran Red Crescent Med J.* 2011;13(4):272-5.
 37. Conforti F, Menichini G, Zanfini L, Tundis R, Statti GA, Provenzano E, et al. Evaluation of phototoxic potential of aerial components of the fig tree against human melanoma. *Cell Prolif.* 2012;45(3):279-85.
 38. Rubnov S, Kashman Y, Rabinowitz R, Schlesinger M, Mechoulam R. Suppressors of cancer cell proliferation from fig (*Ficus carica*) resin: isolation and structure elucidation. *J Nat Prod.* 2001;64(7):993-6.
 39. Sawadogo WR, Le Douaron G, Maciuk A, Bories C, Loiseau PM, Figadere B, et al. In vitro antileishmanial and antitrypanosomal activities of five medicinal plants from Burkina Faso. *Parasitol Res.* 2012;110(5):1779-83.
 40. Singh D, Singh B, Goel RK. Role of saponins for the anticonvulsant effect of adventitious roots of *Ficus religiosa*. *Pharm Biol.* 2012;50(7):816-22.
 41. Singh D, Mishra A, Goel RK. Effect of saponin fraction from *Ficus religiosa* on memory deficit, and behavioral and biochemical impairments in pentylenetetrazol kindled mice. *Epilepsy Behav.* 2013;27(1):206-11.
 42. Singh D, Goel RK. Anticonvulsant effect of *Ficus religiosa*: role of serotonergic pathways. *J Ethnopharmacol.* 2009;123(2):330-4.
 43. Kaur H, Singh D, Singh B, Goel RK. Anti-amnesic effect of *Ficus religiosa* in scopolamine-induced anterograde and retrograde amnesia. *Pharm Biol.* 2010;48(2):234-40.
 44. Kapoor M, Jasani N, Acharya N, Acharya S, Kumar V. Phytopharmacological evaluation and anti-asthmatic activity of *Ficus religiosa* leaves. *Asian Pac J Trop Med.* 2011;4(8):642-4.
 45. Ahuja D, Bijjem KR, Kalia AN. Bronchospasm potentiating effect of methanolic extract of *Ficus religiosa* fruits in guinea pigs. *J Ethnopharmacol.* 2011;133(2):324-8.
 46. Lazreg Aref H, Gaaliche B, Fekih A, Mars M, Aouni M, Pierre Chaumon J, et al. In vitro cytotoxic and antiviral activities of *Ficus carica* latex extracts. *Nat Prod Res.* 2011;25(3):310-9.

47. Aref HL, Salah KB, Chaumont JP, Fekih A, Aouni M, Said K. In vitro antimicrobial activity of four *Ficus carica* latex fractions against resistant human pathogens (antimicrobial activity of *Ficus carica* latex). *Pak J Pharm Sci.* 2010;23(1):53-8.
48. Wang G, Wang H, Song Y, Jia C, Wang Z, Xu H. Studies on anti-HSV effect of *Ficus carica* leaves. *Zhong Yao Cai.* 2004;27(10):754-6.
49. Liu F, Yang Z, Zheng X, Luo S, Zhang K, Li G. Nematicidal coumarin from *Ficus carica* L. *J Asia Pac Entomol.* 2011;14(1):79-81.
50. Stepek G, Lowe AE, Buttle DJ, Duce IR, Behnke JM. In vitro anthelmintic effects of cysteine proteinases from plants against intestinal helminths of rodents. *J Helminthol.* 2007;81(4):353-60.
51. Stepek G, Lowe AE, Buttle DJ, Duce IR, Behnke JM. In vitro and in vivo anthelmintic efficacy of plant cysteine proteinases against the rodent gastrointestinal nematode, *Trichuris muris*. *Parasitology.* 2006;132(Pt 5):681-9.
52. de Amorin A, Borba HR, Carauta JP, Lopes D, Kaplan MA. Anthelmintic activity of the latex of *Ficus* species. *J Ethnopharmacol.* 1999;64(3):255-8.
53. Anis M, Sharma MP, Iqbal M. Herbal ethnomedicine of the gwalior forest division in madhya pradesh, India. *Pharm Biol.* 2000;38(4):241-53.