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Ficus carica Linn.-An Overview

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ABSTRACT

Ficus carica Linn. (Moraceae) is a deciduous tree, which grows in tropical and subtropical regions of India and is commonly known as fig tree. In traditional medicine the roots are used in treatment of leucoderma and ringworms and its fruits which are sweet, have antipyretic, purgative, aphrodisiac properties and have shown to be useful in inflammations and paralysis. *Ficus carica* is claimed to be useful in liver and spleen disorders, to cure piles and in treatment of gout. Locally the leaves are being used in the treatment of jaundice. Charka gave the paste of figs in prescriptions, also as cooked vegetable, emaciation and debility, as a diuretic in urinary stones. Sushrusha included the fruit in a medicated clarified butter for internal use in fever, consumption, asthma, epilepsy and insanity. The present review is therefore, an effort to give a detailed survey of the literature in on its pharmacognosy, phytochemistry, traditional and pharmacological uses.

Key words: *Ficus carica*, anjir, fici, pharmacognosy, phytochemistry, traditional medicine

INTRODUCTION

Plants have been the major source of drugs in Indian system of medicine and other ancient systems in the world. Earliest description of curative properties of medicinal plants is found in Rig-Veda. Charaka Samhita and Sushrusha Samhita give extensive description on various medicinal herbs. Information on medicinal plants in India has been systematically organized (Kirtikar and Basu, 1989; Ram and Malhotra, 1989; Satyavati *et al*., 1976; Satyavati and Gupta, 1987). The medicinal properties of certain plants have been known for centuries (Laughlin, 1963). More than a quarter of the medicines in use today come from plants, i.e., from traditional medicine. Currently, with the active encouragement of the WHO (Watt and Wood, 1988; WHO Expert Committee Diabetes Mellitus, 1980).

Ficus carica Linn. (Mar, Hindi and Guj: Anjir) belongs to family Moraceae. The fig tree (*Ficus carica* L.) is one of the unique *Ficus* species widely spread in tropical and subtropical countries which has edible fruits with high commercial value. Commercial fig production is either located around the Mediterranean Sea or is realized in countries possessing Mediterranean climate as in the case of California, Australia or South America. In Turkey, the major fig producer, around 65% of fig trees are in the Western Aegean Region especially in Small and Big Meander valleys (Aksoy *et al*., 1987, 2001).

A small or moderate sized deciduous tree, 15-30 feet high with broad ovate or nearly orbicular leaves, more or less deeply 3-5 lobed, rough above and pubescent below; fruits axillary, usually peer shaped, variable in size and color. The fig plant is considered to be a native of carica in Asia and

is grown in nearly all tropical and sub-tropical countries. It is now cultivated chiefly in the Mediterranean region, from Turkey in the east to Spain and Portugal in the west; it is also grown commercially in parts of USA and Chile and, to a small extent, in India, Arabia china and Japan. It is grown on a wide variety of soils and is known to do well on heavy clays, rich loams and light sandy soils with free drainage. It thrives best in dry localities with light early rains. A dry climate is necessary at the time of fruit development and maturation. The plant is readily propagated by cuttings. The cuttings which should be short-joined, 8-12 in. long and 0.5-0.7 in. diameter are taken from mature wood 2-3 years old and planted 1 feet apart each way in prepared nursery beds at the beginning of rains. The aim of this paper is to present an overview of pharmacognostical, traditional, phytochemical and pharmacological investigations carried out on the plant (Anonymous, 1999).

PHARMACOGNOSTICAL CHARACTERISTICS

Macroscopical: A small tree with spreading branches and grayish on red bark, leaves green, alternate palmately 3-5 lobed, hairy beneath. Inflorescence consist of pear shaped, hollow, fleshy receptacle bearing staminate and pistillate flowers on its inner surface. Leaves were green, odourless with slight bitter taste. Leaves are 07-09 cm long and 04-06 cm wide, lanceolate in shape; surface is rough on upper and pale green at lower surface, acute, apex oval, cordate base, serrate margin and reticulate venation (Youngken, 2003).

Microscopical: The transverse section of the leaf reveals.

Lamina: Single layer of upper and lower epidermis, covered with a thin cuticle. The lower epidermis showed stomata and it was of anomocytic type. Below the upper epidermis double layer of palisade cells was found. Palisade cells are rectangular and compact. Below the palisade cell layer spongy parenchymatous cells were present in 5-6 layers. Covering, unicellular trichomes were present in large number.

Midrib: The upper and lower epidermal layers of lamina are continuous over the midrib. Two layers of collenchyma were observed above the lower epidermis. The rest of the midrib is occupied by spongy parenchyma with the vascular bundle which is of collateral type. The vascular bundle is surrounded by pericyclic fibres. The unicellular trichomes were also present.

Powder: The behavior of leaf powder upon treatment with different chemical reagents was also observed and reported in Table 1. Fluorescence studies of various powders with various reagents revealed the presence of green and orange fluorescence with Conc. sulphuric acid and sodium hydroxide respectively under UV light at 254 and 366 nm.

Physical constants: The physical constants such as total ash value (5.74%) acid insoluble ash (3.15%) water soluble ash (2.59%) and extractive values are specific identification. The soluble extractive values with solvents such as petroleum ether, chloroform, methanol and ethanol were 2.29, 3.52, 7 and 9.8%, respectively, which indicates the nature of constituents present. Quantitative microscopical study also give valuable information regarding specific leaf constants such as vein islet (20 mm^{-2}),vein termination number (12 mm^{-2}) stomatal number (8.5 and 18 mm^{-2}) upper and lower epidermis, respectively (Fig. 1).

Table 1: Behavior of powdered leaves of *Ficus carica* with different chemical reagents

		U.V. light	
Particulars	Under visible light	Short wavelength	Long wavelength
Powder as such	Dull green	Dark green	-----
Powdered drug + Conc. HCl	Dull green	-----	-----
Powdered drug + Conc. H_2SO_4	Dull green	-----	Green
Powdered drug + Conc. HNO_3	Brown	Dull green	-----
Powdered drug + Glacial acetic acid	Dull brown	-----	-----
Powdered drug + aqueous NaOH	Dull green	Dark green	-----
Powdered drug + alcoholic NaOH	Dark green	Dark green	Orange
Powdered drug + 10% HCl	Dull green	Dark green	Yellow
Powdered drug + 10% H_2SO_4	Dull brown	Dark green	Dull yellow
Powdered drug + 10% HNO_3	Dull green	Dark green	Dull yellow
Powdered drug + 10% glacial acetic acid	Dull green	Dark green	Dull yellow
Powdered drug + Water	Dull green	Dark green	-----

Fig. 1: Fruits and leaves of *Ficus carica*

Traditional uses: The juice of the fruit with honey was prescribed for checking haemorrhage (Vrindamaadhava). In unani medicine, anjeer is used as a mild laxative, expectorant, diuretic; also in the diseases of the liver and spleen as a deobstruent and anti-inflammatory agent. *Ficus carica* and Juglans regia (Akharot) from a good aphrodisiac tonic in unani medicine Anjeer as a dry fruit is also considered a good nutritional support for diabetics (Khare, 2004). In traditional medicine the roots are used in treatment of leucoderma and ringworms and its fruit which are sweet, have antipyretic, purgative, aphrodisiac properties and have shown to be useful in inflammation and paralysis. *Ficus carica* is claimed to be useful in liver and spleen disorders, to cure piles and in treatment of gout. Locally the leaves are being used in the treatment of jaundice (Kirthikar and Basu, 1996; Nadkarnim and Nadkarni, 1995).

Phytochemical properties: Earlier chemical examination of this plant have shown the presence of Psoralen, bergapten, umbelliferone (Kang *et al*., 1995; Louis *et al*., 2000), β-sitosterol, campesterol, stigmasterol, fucosterol, fatty acids (Jeong and Lachance, 2001), 6-(2-methoxy-Z-

vinyl)-7-methyl pyranocoumarin and 9,19 cycloarlane triterpenoid as an anticancer (Weiping *et al*., 1997a, b) and antiproliferative agent: 6-O-acyl-β-D-glucosyl-β-sitosterol (Rubnov *et al*., 2001), calotropenyl acetate and lupeol acetate (Saeed and Sabir, 2002).

PHARMACOLOGICAL ACTIVITIES

Hepatoprotective activity: The methanol extract of the leaves of *Ficus carica* Linn. (Moraceae) was evaluated for hepatoprotective activity in rats with liver damage induced by carbon tetrachloride. The extract at an oral dose of 500 mg kg^{-1} 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 (Mohan *et al*., 2007). The effect of petroleum ether and ethanol extracts of *Ficus carica* was evaluated in ethanol induced hepatotoxicity in rats. Liver cirrhosis was produces by administering repetitive dose of ethanol. The liver damage was evidenced by elevated levels of serum bilirubin, Serum Glutamate Pyruvate Transminase (SGPT) Serum Glutamate Transminase (SGOT) and by histopathological observations of liver sections. Petroleum ether extract of *Ficus carica* leaf significantly reduces these elevated levels of serum bilirubin, SGPT, SGOT. Ethanol induced liver cirrhosis was also found to be reduced as observed histopathologically (Khadbadi *et al*., 2007).

Shade dried leaves of *Ficus carica* were extracted using petroleum ether (60-80°) and tested for antihepatotoxic activity on rats treated with 50 mg kg^{-1} 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 pentobarbitione 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 activity (Gond and Khadabadi, 2008).

Hypoglycemic: The effect of a decoction of fig leaves (*Ficus carica*), as a supplement to breakfast, on diabetes control was studied in insulin-dependent diabetes mellitus (IDDM) patients (six men, four women, age 22-38 years, Body Mass Index (BMI): 20.893.0 kg m^{-2}, HbA1c 7.690.9% with a mean duration of diabetes of 996.3 years). The patients were managed with their usual diabetes diet and their twice-daily insulin injection. During the first month, patients were given a decoction of fig leaves (FC) and during the next month a non-sweet commercial tea (TC). The patients were divided into two groups (n_5) with random allocation and cross-over design (Serraclara *et al*.,1998).

A model of hypertriglyceridaemia in rats is described, which was used to investigate the hypolipidaemic effect of an intraperitoneal (i./p.) administration of a *Ficus carica* leaf decoction. Hypertriglyceridaemia was induced in rats following the protocol: a fasting period of 22, 2 h of oral (p.o.) administration of 20% emulsion of longchain triglycerides (LCT emulsion), both repeated once. The plasma triglyceride and total cholesterol levels obtained 2 h after the protocol were 5.7±2.5 mmol L^{-1} ($p<0.0001$ vs basal levels) and 1.7±0.3 mmol L^{-1}, respectively, n = 10. The new model was used to test the hypotriglyceridaemic effect of a single dose of *Ficus carica* (fig tree) leaf decoction administered i./p. (50 g dry wt kg^{-1} b.wt.). After the i.p. injection of serum saline (control group, n = 10) or *Ficus carica* extract (group A, n = 10), plasma triglyceride levels in the control group and group A were 5.9±2.9 and 5.5±2.9 mmol L^{-1} just after the LCT emulsion protocol; 4.7±2.7 and 0.9±0.4 mmol L^{-1}, $p<0.005$, 60 min after the LCT protocol and 3.6±2.9 mmol L^{-1} and 1.0±0.4 mmol L^{-1}, $p<0.05$, 90 min after the LCT protocol. The plasma total cholesterol levels, which were not modified in our experimental model, showed no significant differences in relation to baseline levels in the presence or absence of *Ficus carica* treatment either.

The clearly positive results suggest the presence in the fig leaf decoction of a compound or compounds that influence lipid catabolism (Perez *et al*., 1999).

Oxidative stress: Parameters related to oxidative stress were studied in rats divided into 4 groups: streptozotocin-induced diabetic rats (n = 10), diabetic rats who received a single dose of a basic fraction of *Ficus carica* extract (n = 14), diabetic rats who 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 presented significantly higher values for erythrocyte catalase normalized to haemoglobin levels (1.5±0.15 vs. 0.96±0.18 μg mg^{-1}) and for plasma vitamin E (73.4±43.9 vs. 12.0±1.6 mg L^{-1}), monounsaturated fatty acids (0.219±0.118 vs. 0.067±0.014 mg mL^{-1}), polyunsaturated fatty acids (PUFA, 0.567±0.293 vs. 0.175±0.040 mg mL^{-1}), saturated fatty acids (0.779±0.262 vs. 0.401±0.055 mg mL^{-1}) and linoleic acid (0.202±0.086 vs. 0.106±0.014 mg mL^{-1}). Both *Ficus carica* fractions tended to normalize the values of the diabetic animals' fatty acids and plasma vitamin E values. On studying the ratios of vitamins E and A to PUFA (129.4±77.5 diabetic and 68.8±9.1 μg mg^{-1} normal; 37.5±20.8 vs. 108.0±43.6 μg mg^{-1}) and to C18:2 (259.9±65.8 vs. 161.0±21.3 μg mg^{-1}; 68.3±37.9 vs. 252.7±102.1 μg mg^{-1}), we found statistically significant differences as a function of diabetes, with the vitamin E/C18:2 ratio being normalized by the administration of the chloroform fraction (to 152.1±80.3 μg mg^{-1}) and the vitamin A/C18:2 ratio being raised relative to the untreated diabetic rats by the administration of the basic fraction (91.9±14.5 μg mg^{-1}). Present work confirms that antioxidant status is affected in the diabetes syndrome and that *Ficus carica* extracts tend to normalize it (Perez *et al*., 2003).

Antifungal: A low-molecular-weight protein with antifungal activity was isolated from freshly collected latex of the Inzhir tree (*Ficus carica* L.) by successive affinity chromatography over chitin, cation-exchange chromatography over SP-Sephadex C-50 and reversed-phase HPLC. The molecular weight of 6481 and the partial N-terminus sequence of the protein were determined (Mavlonov *et al*., 2008).

Antispasmodic: To rationalize the medicinal use of gig (*Ficus carica*) in gastrointestinal and inflammatory disorders. The aqueous-ethanolic extract of *Ficus carica* (Fc.Cr) was studied for antispasmodic effect on the isolated rabbit jejunum preparations and for antiplatelet effect using ex vivo model of human platelets.

Fc.Cr tested positive for alkaloids, flavonoids, coumarins, saponins, sterols and terpenes. When tested in isolated rabbit jejunum, Fc.Cr (0.1-3.0 mg mL^{-1}) 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. Pretreatment of the tissue with glibenclamide caused rightward shift in the curves of low K^+-induced contractions. Similarly, cromakalim inhibited the contractions induced by low K^+, but not of high K^+, while verapamil equally inhibited the contractions of K^+ at both concentrations. Fc.Cr (0.6 and 0.12 mg mL^{-1}) 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* possiblymediated 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 disorders (Gilani *et al*., 2008).

Antipyretic: A study was carried out to evaluate the antipyretic effect of an ethanol extract of leaves, of *Ficus carica* Linn. belonging to the family of Moraceae, at normal body temperature and

yeast-induced pyrexia, in albino rats. A yeast suspension (10 mL kg^{-1} b.wt.) increased rectal temperature 19 h after the subcutaneous injection. The ethanol extract of *Ficus carica*, at doses of 100, 200 and 300 mg kg^{-1} b.wt. p.o., showed significant dose-dependent reduction in normal body temperature and yeast-provoked elevated temperature. The effect extended up to five hours after drug administration. The anti-pyretic effect of the ethanol extract of *Ficus carica* was comparable to that of Paracetamol (150 mg kg^{-1} b.wt., p.o.), a standard anti-pyretic agent (Vikas *et al*., 2010).

Anthelmintic: The latex of some species of *Ficus* (Moraceae) has been traditionally used as vermifuge in Central and South America. It has been accepted that anthelmintic activity is due to a proteolytic fraction called ficin. In the present study, the anthelmintic activity of the latex of *Ficus insipida* Willd. and *Ficus carica* L. has been investigated in NIH mice naturally infected with *Syphacia obvelata, Aspiculuris tetraptera* and *Vampirolepis nana*. The latex of *F. insipida*, administered by intragastric route in doses of 4 mL/kg/day during three consecutive days, were effective in the removal of 38.6% of the total number of *S. obvelata*, being inexpressive in the removal of *A. tetraptera* (8.4%) and segments of *V. nana* (6.3%). The latex of *F. carica*, administered in doses of 3 mL/kg/day, during three consecutive days, was effective in the removal of *S. obvelata* (41.7%) and it did not produce significant elimination of *A. tetraptera* (2.6%) and *V. nana* (8.3%). The observed high acute toxicity with hemorrhagic enteritis, in addition to a weak anthelmintic efficacy, do not recommend the use of these lattices in traditional medicine (Amorin *et al*., 1999).

Antioxidant: Fig fruit has been a typical component in the health-promoting Mediterranean diet for millennia. To study the potential health-promoting constituents of fig fruits, six commercial fig varieties differing in color (black, red, yellow and green) were analyzed for total polyphenols, total flavonoids, antioxidant capacity and amount and profile of anthocyanins. Using reversed-phase liquid chromatography (RP-LC), various concentrations of anthocyanins but a similar profile was found in all varieties studied. Hydrolysis revealed cyanidin as the major aglycon. Proton and carbon NMR confirmed cyanidin-3-O-rhamnoglucoside (cyanidin-3-O-rutinoside; C3R) as the main anthocyanin in all fruits. Color appearance of fig extract correlated well with total polyphenols, flavonoids, anthocyanins and antioxidant capacity. Extracts of darker varieties showed higher contents of phytochemicals compared to lighter colored varieties. Fruit skins contributed most of the above phytochemicals and antioxidant activity compared to the fruit pulp. Antioxidant capacity correlated well with the amounts of polyphenols and anthocyanins (R^2 = 0.985 and 0.992, respectively). In the dark-colored Mission and the red Brown-Turkey varieties, the anthocyanin fraction contributed 36 and 28% of the total antioxidant capacity, respectively. C3R contributed 92% of the total antioxidant capacity of the anthocyanin fraction. Fruits of the Mission variety contained the highest levels of polyphenols, flavonoids and anthocyanins and exhibited the highest antioxidant capacity (Solomon *et al*., 2006).

Antimutagenic: Antimutagenic action of plant extracts of *Armoracia rusticana, Ficus carica, Zea mays* and their mixture on environmental xenobiotics has been investigated. The plant extracts and their mixture decreased the level of mutations induced by N-metil-N'-nitro-N-nitrozoguanidin (MNNG) in Vicia faba cells, chlorophyll mutations in Arabidopsis thaliana and NaF induced mutability in rat marrow cells. The studied plant extracts and their mixture demonstrate the ability to decrease the genotoxicity of environmental mutagens (Agabeili and Kasimova, 2005).

Anti-HSV: To study the anti-HSV effect of the extract from the leaves of *Ficus carica*. The effective ingredient was extracted from the leaves of *Ficus carica* and the anti-virus effect was observed on Hep-2, BHK21 and PRK cells. The water extract from the leaves of *Ficus carica* possessed distinct anti-HSV-1 effect. The MTC was 0.5 mg mL^{-1}, TDO was 15 mg mL^{-1} and TI was 30.0. 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 expansive foreground (Wang *et al*., 2004).

REFERENCES

Agabeili, R.A. and T.E. Kasimova, 2005. Antimutagenic activity of *Armoracia rusticana, Zea mays* and *Ficus carica* plant extracts and their mixture. Tsitol. Genet., 39: 75-79.

Aksoy, U., D. Anac, H.H. Hakerlerler, M. Du-Zbastýlar and Y.S.I. Germencik, 1987. Nutritional status of fig orchards in germencik region and relationships between investigated plant nutrients and some yield components and quality. Taris¸ AR-GE, Project No.006, Bornova-Iÿzmir, Turkey.

Aksoy, U., H.Z. Can, S. Hepaksoy and N. Sahin, 2001. Fig Cultivation. TARP Turkey Agricultural Research, Izmir, Turkey.

Amorin, A.D., R.B. Helcio, P.P. Jorge-Carauta, D. Lopes and M.A.C. Kaplan, 1999. Anthelmintic activity of the latex of *Fiscus* species. J. Enthnopharmacol., 64: 225-258.

Anonymous, 1999. The Wealth of India: A Dictionary of Indian Raw Materials and Industrial Products. Vol. 4, Council of Scientific and Industrial Research, New Delhi.

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*. J. Ethnopharmacol., 119: 1-5.

Gond, N.Y. and S.S. Khadabadi, 2008. Hepatoprotective activity of *Ficus carica* leaf extract on rifampicin-induced hepatic damage in rats. Indian J. Pharm Sci., 70: 364-366.

Jeong, W.S. and P.A. Lachance, 2001. Phytosterols and fatty acids in fig (*Ficus carica*, var. Mission) fruit and tree components. J. Food Sci., 66: 278-281.

Kang, S.K., D.O. Chung and H.J. Chung, 1995. Purification and identification of antimicrobial substances in phenolic fraction of fig leaves. J. Korean Agric. Chem. Soc., 38: 293-296.

Khadbadi, S.S., N.Y. Gond, N.B. Ghiware and G.R. Shendarkar, 2007. Hepatoprotective effect of *Ficus carica* leaf in chronic hepatitis. Indian Drugs, 44: 54-57.

Khare, C.P., 2004. Encyclopedia of Indian Medicinal Plants Rational Western Therapy, Ayurvedic and other Traditional Usage, Botany. Springer, USA., ISBN-13: 9783540200338.

Kirtikar, K.R. and B.D. Basu, 1989. Indian medicinal plants. Periodical Experts Book Agency, Delhi, India, pp: 1-2791.

Kirtikar, K.R. and B.D. Basu, 1996. Indian Medicinal Plants. 2nd Ed., Indian Press, Allahabad, pp: 61-62.

Laughlin, W., 1963. Primitive theory of medicine: Empirical knowledge. N.Y. Acad. Med. Monogr., 4: 116-140.

Louis, P., P. Patrick, M. Andre, B.J. Marie, F. Andre and J.R. Paul, 2000. Bergapten content in fig leaves. Ann. des Falsifications de Expertise chimiqui et toxicologique, 93: 427-435.

Mavlonov, G.T., K.A. Ubaidullaeva, M.I. Rakhmanov, I.Y. Abdurakhmonov and A. Abdukarimov, 2008. Chitin-binding antifungal protein from *Ficus carica* latex. Chem. Nat. Compounds, 44: 216-219.

Mohan, G.K., E. Pallavi, B.R. Kumar, M. Ramesh and S. Venkatesh, 2007. Hepatoprotective activity of *Ficus carica* Linn. leaf extract against carbon tetrachloride-induced hepatotoxicity in rats. DARU., 15: 162-166.

Nadkarnim, K.M. and A.K. Nadkarni, 1995. Indian Material Medica. 3rd Edn., Popular Prakashan, Bombay, India, pp: 545-547.

Perez, C., J.R. Canal and J.E. Campillo, 1999. Hypotriglyceridaemic activity of *Fiscus carica* leaves in experimental hypertriglyceridaemic rats. Phytother. Res., 13: 188-191.

Perez, C., J.R. Canal and M.D. Torres, 2003. Experimental diabetes treated with *Ficus carica* extract: Effect on oxidative stress parameters. Acta Diabetol., 40: 3-8.

Ram, P.R. and B.N. Malhotra, 1989. Indian Medicinal Plants. Central Drug Research Institute, New Delhi.

Rubnov, S., Y. Kashman, R. Rabinowitz, M. Schlesinger and R. Mechoulam, 2001. Suppressors of cancer cell proliferation from fig (*Ficus carica*) Resin: Isolation and structure elucidation. J. Nat. Prod., 64: 993-996.

Saeed, M.A. and AW. Sabir, 2002. Irritant potential of triterpenoids from *Ficus carica* leaves. Fitoterapia, 73: 417-420.

Satyavati, G.V. and A.K. Gupta, 1987. Medicinal plants of India. New Delhi ICMR., 2: 272-278.

Satyavati, G.V., M.K. Raina and M. Sharma, 1976. Medicinal Plants of India. Vol. 1, Indian Council of Medical Research, New Delhi, India.

Serraclara, A., F. Hawkins, C. Perez, E. Dominguez, J.E. Campillo and M.D. Torres, 1998. Hypoglycemic action of an oral fig-leaf decoction in type-I diabetic patients. Diabetes Res. Clin. Pract., 39: 19-22.

Solomon, A., S. Golubowicz, Z. Yablowicz, S. Grossman and M. Bergman *et al.*, 2006. Antioxidant activities and anthocyanin content of fresh fruits of common fig (*Ficus carica* L.). J. Agric. Food Chem., 54: 7717-7723.

Vikas, V.P., S.C. Bhangale and V.R. Patil, 2010. Evaluation of anti-pyretic potential of *Ficus carica* leaves. IJPSRR., 2: 48-50.

WHO Expert Committee Diabetes Mellitus, 1980. Definition and diagnosis and treatment of diabetes mellitus and intermediate hyperglycemia. WHO., Tech. Report Series No. 646.

Wang, G., H. Wang, Y. Song, C. Jia, Z. Wang and H. Xu, 2004. Studies on anti-HSV effect of *Ficus carica* leaves. Zhong Yao Cai, 27: 754-756.

Watt, J. and C. Wood, 1988. Talking Health: Conventional and Complementary Approaches. Royal Society of Medicine, London.

Weiping, Y., C. Hongming, W. Tianxin and C. Mengshen, 1997a. A new coumar in compound with anticancer activity. Zhongcaoyao, 28: 3-4.

Weiping, Y., C. Hongming, W. Tianxin and C. Mengshen, 1997b. Research on the chemical structure and anticancer activity of 9,19-cyclopropane-24, 25ethyleneoxide-5-en-3β-spirostol. Chinese J. Med. Chem., 7: 46-47.

Youngken, H.W., 2003. Natural Drugs: Morphologic and Taxonomic Consideration. 2nd Edn., Kessinger Publishing, Delhi.