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(Review Article)

Ficus carica Linn.: A Review on its Pharmacognostic, Phytochemical and Pharmacological Aspects

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ABSTRACT

Ficus carica Linn. (Moraceae) is commonly known as Angir is a middle sized laticiferous deciduous tree, widely distributed in all tropical and sub-tropical countries. In addition to umbelliferone, scopoletin, the phytoconstituents like psoralens, bergapten, xanthotoxin, xanthotoxol, marmesin have been isolated from leaves and peptides from latex. The fruit extracts possessed activity in anaemia, latex as anthelmintic (due to ficin) and anticarcinogenic. Traditionally, the plant is being used as purgative, aphrodisiac, anti-inflammatory, expectorant, diuretic, anti- anxiety (mild sedative). The present review is therefore, an effort to give a detailed survey of the literature on its pharmacognosy, phytochemistry, and pharmacological properties.

Key Words: *Ficus carica* Linn., Traditional medicine, Common fig, Pharmacognosy, Phytochemistry, Pharmacological properties.

INTRODUCTION

India has an ancient heritage of traditional medicine. The material medica provides a great deal of information on the folklore practices and traditional aspects of therapeutically important natural products. Indian traditional medicine is based on various systems including Ayurveda, Siddha, Unani and Homoeopathy. The evaluation of all these drugs is based on phytochemical and pharmacological approaches which lead to drug discovery often is reffered to as "natural product screening[1]". Any part of the plant may contain active components like bark, leaves, flowers, roots, fruits, seeds, etc[2]. The beneficial medicinal effects of plant materials typically result from the combinations of secondary products present in the plant. In this regard, one such plant is *Ficus Carica* Linn., one of the oldest medicinal plant recorded in the Indian system of medicine (Family- Moraceae). Literature survey indicated that figs (*Ficus Carica* Linn.) are cultivated for over 11,000 years and figs, which almost certainly predate for human use, are the earliest cultivated plants [3]. Even the olympic athletes were given figs as a training food and figs were given as laurels to the winners of the first Olympics as a "medal[4]". Figs and fig trees throughout the world and the *Ficus* genus were also very likely one of the earliest and best sources of cultivated medicine as well as of food for people, and for their domesticated animals[5].

Ficus

In english "giving a fig" means to care about something. The word *ficolin*, which appears similar to *Ficus* and refers to a lectin like compound combining the first parts of the words for *fibrinogen* and *collagen*[6]. *Ficus* latex has been used as a shamanic inebriant by Peruvian shamans, to serve as a powerful botanic "teacher of medicine[7]".

The genus, *Ficus*, consists of over 800 species and is one of about 40 genera of the mulberry family, Moraceae. Many *Ficus* species consists of numerous varieties, significant genetic diversity, outstanding pharmacological activities and these are of remarkable commercial importance[8].

Various species of Ficus[9]

Ficus altissima (council tree), *Ficus aspera* (clown fig), *Ficus auriculata*, syn. *Ficus roxburghii*, *Ficus benghalensis* (Indian banyan), *Ficus benjamina* (weeping fig), *Ficus benjamina* 'Exotica', *Ficus benjamina* 'Comosa', *Ficus binnendykii* (narrow-leaf ficus), *Ficus carica* (common edible fig), *Ficus celebinsis* (willow ficus), *Ficus deltoidea* (mistletoe fig) syn. *Ficus diversifolia*, *Ficus elastica* (Indian rubber tree), *Ficus elastica* 'Abidjan', *Ficus elastica* 'Asahi', *Ficus elastica* 'Decora', *Ficus elastica* 'Gold', *Ficus elastica* 'Schrijveriana', *Ficus lacor* (pakur tree), *Ficus lingua* (box-leaved fig) syn. *Ficus buxifolia*, *Ficus lyrata* (fiddle-leaf fig), *Ficus macrophylla* (Moreton Bay fig), *Ficus microcarpa* (Chinese banyan), *Ficus microcarpa* var. crassifolia (wax ficus), *Ficus microcarpa* 'Variegata', *Ficus pseudopalma* (Philippine fig), *Ficus pumila* (creeping fig) syn. *Ficus repens*, *Ficus religiosa* (bo tree or sacred fig), *Ficus rubiginosa* (Port Jackson fig or rusty fig), *Ficus rubiginosa* 'Variegata' Ficus sagittata, *Ficus radicans* (Variegata), *Ficus saussureana*, syn. *Ficus dawei*, *Ficus stricta*, *Ficus subulata*, syn. *Ficus salicifolia, Ficus tikoua* (Waipahu fig).

Disribution

Fig is distributed in Southwest Asia and the Eastern Mediterranean region, from the Turkey in the East to Spain and Portugal in the West; it is also grown commercially in parts of U.S.A. and Chile and to small extent, in Arabia, Persia, India, China and Japan. It is cultivated in India commercially few centres near Pune (Maharastra) and Bellary and Anantpur districts (South India). In Punjab, Uttar Pradesh and Mysore, it is mostly grown scattered in gardens or in homeyards[10].

Taxonomy

Taxonomically it is classified as[11] :
Kingdom- *plantae*
Subkingdom- *tracheobionta*
Superdivision- *spermatophyta*
Division- *magnoliphyta*
Class- *maghnoliosida*
Subclass- *hamamelididae*
Order- *urticales*
Family -*moraceae*
Genus- *Ficus*
Species-*carica*

Vernacular names

Vernacular names are as in english- *common fig tree*, hindi- *angir*, sanskrit- *angira*, bengali- *angir*. kannad-*anjura*, tamil- *tenatti*, telgu- *anjuru*, marathi- *anjra*, punjabi-*fagari*[11].

Morphology

Tree of *Ficus carica* L. (Fig. 1) is usually 15 to 20 ft tall, with numerous spreading branches and a trunk rarely more than 7 ft in diameter. The latex of the plant is milky white mainly contains, ficin (a protein digesting enzyme). The root system in the plant is typically shallow and spreading, sometimes covering 50 ft of ground, but in permeable soil some of the roots may descend to 20 ft. Many *Ficus* produce aerial roots that descend to the ground. In some species originating in the rainforests, the small *Ficus* plant takes up residence in a tree top, and dropping aerial roots, gradually overcomes and strangles its host[12].

The leaves of the plant are broad, ovate or nearly 3-5 lobed, rough above and pubescent below. Fruits are axillary, usually pear shaped, variable in size and color. Although considered a fruit, the fig is actually a flower inverted into it. The fig is juicy and sweet when ripe, gummy with latex before ripening. There is a dynamic within the syconium, the name for the fruit sac of the fig, in which pistils can accommodate either a wasp egg until it hatches or seed of the fig, but not both[13]. In dry periods, the competition for the pistils is keener, and so the mechanism of allotment becomes relatively more important[14].

Seeds vary greatly in size and number from 30 to 1600 per fruit. The seeds are the real fruits in figs. These are the only fruits to ripen fully or semidry on the tree and are stored for later consumption[15]. Chromosome number and morphology of the genus *Ficus* is reported in literature[16, 17, 18], which states that the chromosomes of the various fig species are similar to each other in appearance and 2n = 26 is the basic chromosome number in all figs. The genome size of fig is small, less than three times that of *Arabidopsis*[19].

In the traditional system of medicine, the plant is used for various health problems and diseases. Therefore the aim of this paper is to present an overview of pharmacognostical, traditional, phytochemical and pharmacological investigation carried out on the plant.

PHARMACOGNOSTICAL CHARACTERSTICS

Macroscopy

A small tree with spreading branches and greyish on red bark, leaves green, large (to 1 ft length), alternate palmately 3-5 lobed, hairy beneath (Fig. 1). Inflorescence consist of pear shaped, hollw, fleshy, receptacle bearing staminate and pistillate flowers on its inner surface. The tiny flowers of the fig are out of sight, clustered inside the green "fruits", technically a synconium. Pollinating insects gain access to the flowers through an opening at the apex of the synconium. Leaves are green, odourless with slight bitter taste. Leaves are 7-9 cm long and 4-6 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[20]. The matured "fruit" has a tough peel (pure green, green suffused with brown, brown or purple), often cracking upon ripeness, and exposing the pulp beneath. The interior is a white inner rind containing a seed mass bound with jelly-like flesh. Seeds may be large, medium, small or minute and range in number from 30 to 1,600 per fruit. The edible seeds are numerous and generally hollow, unless pollinated. Pollinated seeds provide the characteristic nutty taste of dried figs. Fig. 2 shows the latex (i), leaf (ii), fruit (iii) and seeds (iv) of *Ficus carica* Linn.

Microscopy

The transverse section of the leaf reveals[21]:

Lamina

Single layer of upper and lower epidermis, covered with thin cuticle. The lower epidermis shows anomocytic stomata. Double layer of palisade cells is found below the upper epidermis. Palisade cells are round and compact. Below the palisade cell layer spongy parenchyma cells are present in 5-6 layers. Covering, unicellular trichomes are present in large numbers.

Midrib

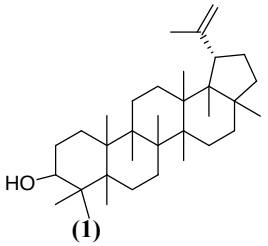
The upper and lower epidermal layers of lamina are continuous over the midrib. Two layers of collenchyma cells are present above the lower epidermis. The rest of the mid rib is occupied by spongy parenchyma with vascular bundle which is of collateral type. The vascular bundle is surrounded by pericyclic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

PHYSICAL CONSTANTS

Physical constants such as total ash value (5.74 %), acid soluble ash (3.15%), water soluble ash (2.59 %) and extractive values are specific identifications. The soluble extractive values with solvents such as petroleum ether, chloroform, methanol and ethanol are 2.29, 3.52, 7 and 9.8% respectively which indicates the nature of constituents present. Quantitative microscopical study also give useful 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.

PHYTOCHEMICAL PROPERTIES

Phytochemicals are the chemicals produced by plants. Literature survey indicated the presence of coumarins, flavonoids, sterols, triterpenoids, anthocyanins *etc*, in various parts of the plant. Dried seeds contain fixed oil containing the fatty acids *viz* oleic acid, linoleic acid, linolenic acid, palmitic acid, stearic acid, arachidic acid[15]. Leaves contain bergapten, 4′,5′-dihydropsoralen, rutin, 24-methylenecycloartanol umbelliferone, marmesin, stigmasterol, β-sitosterol, ficusogenin, lupeol, psoralen ψ-taraxasterol ester and tyrosine moisture, protein, fat, crude fiber, ash, N-free extract, pentosans, carotene on a dry weight basis[22, 23, 24, 25, 26, 27, 28]. The latex contains 6-*O*-linoleyl-β-D-glucosyl-β-sitosterol, 6-*O*-Oleyl-β-D-glucosyl-β-sitosterol, 6-*O*-palmitoyl-β-D- glucosyl-β-sitosterol, caoutchouc, resin, albumin, cerin, sugar and malic acid, rennin, proteolytic enzymes, diastase, esterase, lipase, catalase, and peroxidase[29]. Fruits contain cyanidin-3-*O*-glucoside, cyanidin-3-*O*-rhamnoglucoside, saturated fat, cholesterol, sodium, insoluble sugars, protein, vitamin A, vitamin C, calcium, iron[30]. Roots contain psoralen, bergapten[22, 23, 26, 28]. Fig. 3 shows the structures of phytochemical constituents present in *Ficus carica* Linn. Various pharmacological activities have been reported as shown in Table -1. Following are the chemical structures of few important compounds (**1-50**) isolated from *Ficus carica* Linn.: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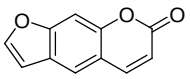
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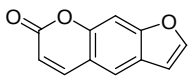
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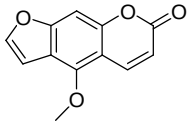
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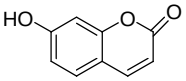
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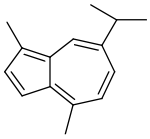
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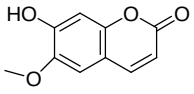
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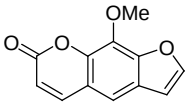
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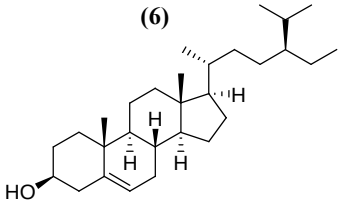
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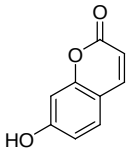
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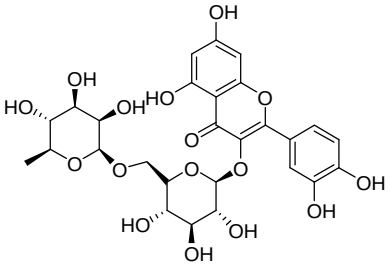
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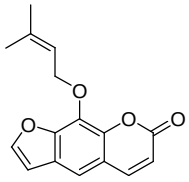
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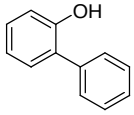
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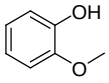
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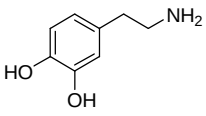
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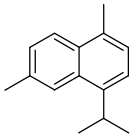
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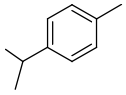
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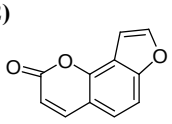
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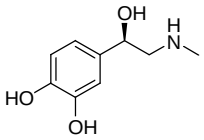
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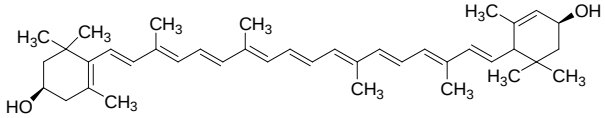
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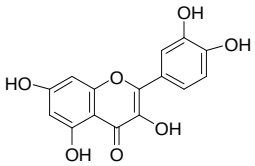
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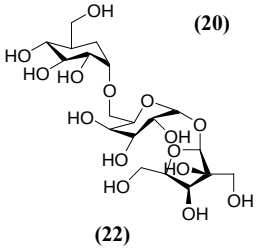
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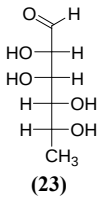
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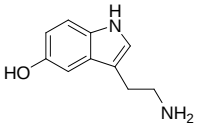
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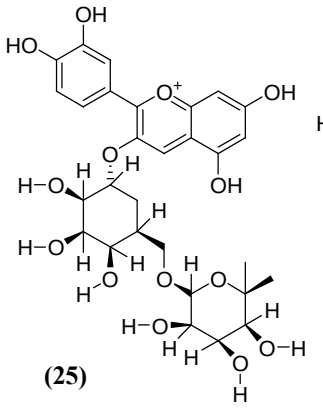

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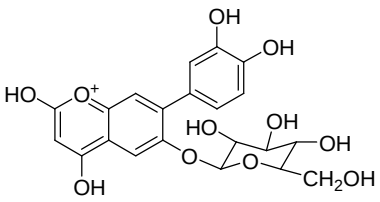

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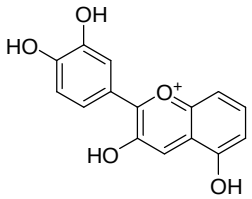

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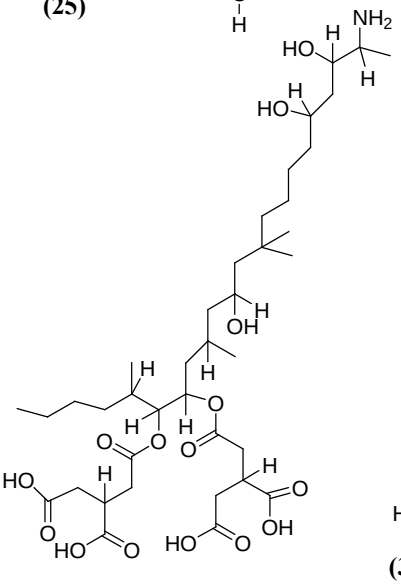

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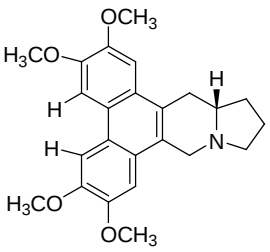

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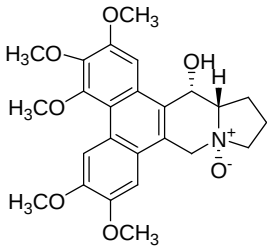

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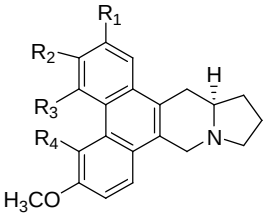
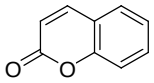


(31) R_1, $R_2 = OCH_2O$, $R_3 = H$, $R_4 = OCH_3$
(32) R_1, $R_2 = OCH_2O$, R_3, $R_4 = H$
(33) $R_1 = H$, R_2, $R_3 = OCH_3$, $R_4 = H$



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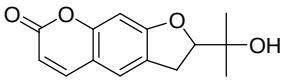

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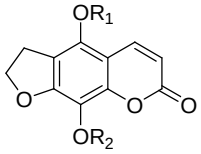
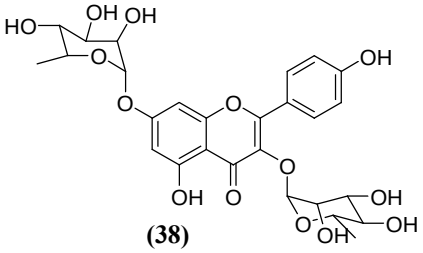
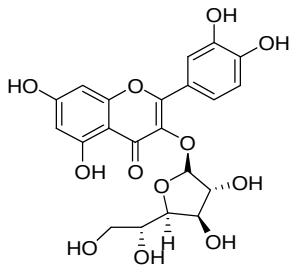


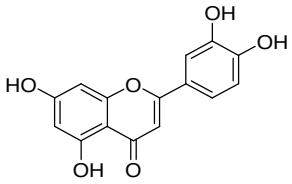
(36) R_1 = Glc, $R_2 = H$
(37) $R_1 = H$, R_2 = Glc



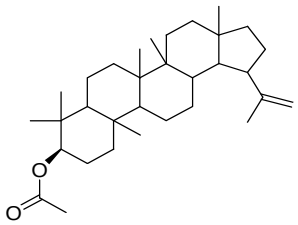
(38)



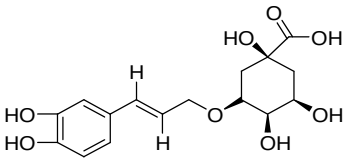
(39)



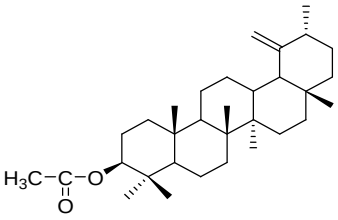
(40)



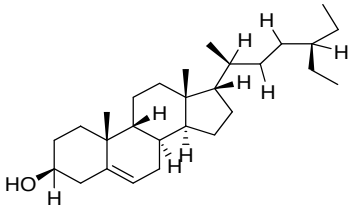
(41)



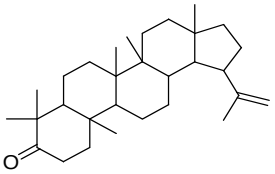
(42)



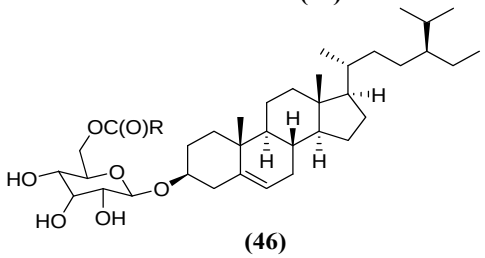
(43)



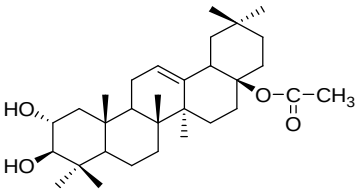
(44)



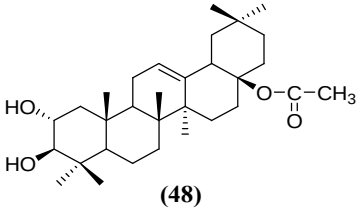
(45)



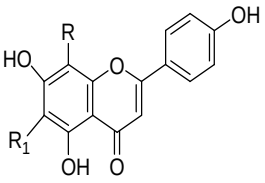
(46)



(47)



(48)



(49) R= Arabinosyl, R_1 = Glucosyl
(50) R= Glucosyl, R_1 = Arabinosyl

Lupeol (leaf) (1); psoralen (root) (2); ficusin (leaf) (3); bergapten (leaf) (4); umbeliferone (leaf) (5); guaiazulene (root) (6); scopoletin (leaf) (7); xanthotoxin (leaf) (8); β- sitosterol (leaf) (9); 7-hydroxy coumarin (leaf) (10); rutin (leaf) (11); imperatorin (leaf) (12); *o*-phenylphenol (fruit) (13); guaiacol (root) (14); dopamine (fruit) (15); cadalene (leaf) (16); ρ- cymene(fruit) (17); angelicin (fruit) (18); adrenaline (fruit) (19); lutein (leaf) (20); quercitin (leaf) (21); raffinose (fruit) (22); rhamnose (fruit) (23); serotonin (root) (24); cyanidin-3-o-rhamnoglucoside, cyanidin-3-*o*-rutinoside (25); cyanidin-3-*o*-glucoside (26); cyanidin (27); fumonisin b1 (28); tylophorin (29); ficuseptine A (30); b (31); c(32); d(33); coumarin (34); marmesin (35); 5-*o*-β-d-glucopyranosyl-8-hydroxypsoralen (36); 8-*o*-β-d-glucopyranosyl-5- hydroxypsoralen (37); kaempferitrin (38); isoquercitrin (39); luteolin (40); lupenylacetate (41); chlorogenic acid (42); caloptropenyl acetate (43); stigmasterol (44); lupenone (45); 6-*o*-acyl-β-d-glucosyl-β-sitosterol (46); Methylmeslinate (47); Oleanolic acid (48); schaftoside (49); isoschaftoside (50)

SPECTROSCOPIC DATA OF SOME IMPORTANT COMPOUNDS

Methylmeslinate (47)[24]
Colourless crystals
Melting Point (M.P.): 232-233˚C
FTIR ($CHCl_3$) υ_{max} cm^{-1}
1725 cm^{-1} (CO_2Me), 3400 cm^{-1} (OH), 1635 cm^{-1} and 820 cm^{-1} (trisubstituted double bond)
^{1}H-NMR ($CDCl_3$, 400MHz, δ ppm)
δ5.29 (1H, triplet, H-12), δ3.62 (3H, singlet, OCH_3, Me-31), δ3.60 (1H, multiplet, H-2), δ3.0 (1H, doublet, H-3), δ1.13 (3H, singlet, Me-27), δ1.03 (3H, singlet, Me-26), δ0.98 (3H, singlet, Me-23), δ0.93 (3H, singlet, Me-25), δ0.90 (3H, singlet, Me-29), δ0.82 (3H, singlet, Me-24), δ0.73 (3H, singlet, Me-30).
MS m/z (Relative intensity %)
486 ($C_{31}H_{50}O_4$, M^+)
^{13}C-NMR ($CDCl_3$, 125 MHz, δ ppm)
46.55 (C-1), 68.79 (C-2), 83.59 (C-3), 39.21 (C-4), 55.43 (C-5), 18.38 (C-6), 32.68 (C-7), 39.17 (C-8), 47.58 (C-9), 38.39 (C-10), 23.54 (C-11), 122.25 (C-12), 143.68 (C-13), 41.76 (C-14), 27.67 (C-15), 23.15 (C-16), 46.69 (C-17), 41.38 (C-18), 45.89 (C-19), 30.72 (C-20), 33.96 (C-21), 32.46 (C-22), 28.65 (C-23), 16.63 (C-24), 16.64 (C-25), 16.66 (C-26), 25.98 (C-27), 177.95 (C-28), 33.12 (C-29), 23.67 (C-30) and 51.48 (C-31)

Oleanolic acid (48)[24]
Colorless crystals
M.P. 305-306˚C
IR ($CHCl_3$) υ_{max} cm^{-1}
3510 cm^{-1} (OH), 3050 cm^{-1},1635 cm^{-1} and 820 cm^{-1} (trisubstituted double bond) and 1697 cm^{-1} (carboxyl group).
^{1}H-NMR ($CDCl_3$, 400MHz, δ ppm)
δ5.24 (1H, multiplet, H-12), δ3.22 (1H, double doublet, H-3), δ1.15 (3H, singlet, Me-27), δ1.01 (3H, singlet, Me-23), δ0.94 (3H, singlet, Me-30), δ0.93 (3H, singlet, Me-25), δ0.90 (3H, singlet, Me-29), δ0.84 (3H, singlet, Me-24), δ0.79 (3H, singlet, Me-26)
MS m/z (Relative intensity %)
456 ($C_{30}H_{48}O_3$, M^+)
^{13}C-NMR ($CDCl_3$, 125 MHz, δ ppm)
40.17 (C-1), 27.19 (C-2), 89.74 (C-3), 40.76 (C-4), 57.26 (C-5), 19.37 (C-6), 33.25 (C-7), 40.40 (C-8), 48.67 (C-9), 37.98 (C-10), 24.00 (C-11), 123.79 (C-12), 144.85 (C-13), 42.96 (C-14), 28.95 (C-15), 24.59 (C-16), 49.06 (C-17), 42.58 (C-18), 47.23 (C-19), 31.56 (C-20), 34.91 (C-21), 33.97 (C-22), 28.70 (C-23), 17.32 (C-24), 16.28 (C-25), 17.88 (C-26), 26.35 (C-27), 178.08 (C-28), 33.52 (C-29) and 24.09 (C-30)

Calotropenyl acetate (43)[24]
Colorless
M.P. 198-200˚C
IR ($CHCl_3$) υ_{max} cm^{-1}
1725.44 cm^{-1} and 1320.19 cm^{-1} for acetate group, 1642.70 cm^{-1} and 902.65 cm^{-1} for exomethylene group
^{1}H-NMR ($CDCl_3$, 400MHz, δ ppm)
δ4.61 and 4.67 (as two broad singlets, 2H and 1H respectively, of vinylic protons), δ4.51, δ2.10 (singlet), δ0.91 (3H doublet), δ0.82 (two methyls singlets), δ0.83 (singlet) , δ1.00 (singlet), δ1.01 (singlet), δ1.03 (singlet).
MS m/z (Relative intensity %)
468 ($C_{32}H_{52}O_2$, M^+)
^{13}C-NMR ($CDCl_3$, 125 MHz, δ ppm)
38.55 (C-1), 23.73 (C-2), 81.98 (C-3), 37.86 (C-4), 55.50 (C-5), 18.27 (C-6), 34.09 (C-7), 41.05 (C-8), 48.77 (C-9), 37.55 (C-10), 21.53 (C-11), 25.68 (C-12), 39.29 (C-13), 42.10 (C-14), 26.21 (C-15), 28.69 (C-16), 37.57 (C-17), 59.42 (C-18), 154.56 (C-19), 39.43 (C-20), 31.21 (C-21), 38.98 (C-22), 28.01 (C-23), 16.56 (C-24), 15.98 (C-25), 16.35 (C-26), 25.55 (C-27), 28.11 (C-28), 107.25 (C-29) and 19.55 (C-30), 170.85 (CH_3-C-O-) and 21.23 (CH_3-C-O-)

Lupeol (1)[31]
White crystalline compound
M.P.; 210-212°C.
IR ν_{max} (KBr):

3449, 2961, 2926, 2849, 1452, 1254 and 1024 cm^{-1}.
^1H NMR ($CDCl_3$, 400 MHz, δ ppm):
0.74, 0.79, 0.85, 0.94, 0.97, 1.05 (each 3H, s, Me-28, Me-23, Me-24, Me-25, Me-26, Me-27), 1.66 (3H, s, Me-30), 3.18 (1H, H-3), 4.57 (1H, H-29), 4.67 (1H, H-29).
EIMS m/z (rel. int. %) :
426 ($C_{30}H_{50}O$, M^+) (20), 411 (M-Me)$^+$ (25), 408 (M-H_2O)$^+$ (30), 393 (M-Me-H_2O)$^+$ (35), 385 (M-41)$^+$ (15), 220 (M-$C_{15}H_{26}$)$^+$ (80), 218 (M-$C_{14}H_{24}O$)$^+$ (55), 207 (M- $C_{16}H_{27}$)$^+$ (25), 189 (M-$C_{16}H_{29}O$)$^+$ (100) and 139 (M-$C_{21}H_{35}$)$^+$ (70).
^{13}C NMR ($CDCl_3$, 400 MHz, δ ppm) :
38.0 (C-1), 27.4(C-2), 78.0 (C-3), 38.7 (C-4), 55.3 (C-5), 55.3 (C-5), 18.3 (C-5), 18.3 (C-6), 34.0 (C-7), 40.1 (C-8), 50 4 (C-9), 37.7 (C-10), 20.9 (C-11), 25.1 (C-12), 38.0 (C-13), 42.8 (C-14), 27.4 (C-15), 35.6 (C-16), 42.8 (C-17), 48.2 (C-18), 48.0 (C-19), 150.8 (C-20), 28.5 (C-21), 40.0 (C-22), 28.1 (C-23), 15.4 (C-24), 16.1 (C-25), 15.9 (C-26), 14.6 (C-27), 18.0 (C-28), 109.3 (C-29), 19.4 (C-30).

β- Sitosterol (9)[24]
White shining crystals
M.P. 134.5°C.
IR ν_{max} (KBr): 3420, 2924, 1463, and 884 cm^{-1}.
^1H NMR ($CDCl_3$, 400 MHz, δ ppm): 0.63, 0.77, 0.81, 0.83, 0.88, 0.92 (each 3H, s, Me-18, Me-29, Me-27, Me-26, Me-21, Me-19), 3.36 (1H, H-3), 5.32 (1H, H-6).
MS m/z (rel. int. %): 414, ($C_{29}H_{50}O$, M^+) (15), 399 (M-Me)$^+$ (10), 396 (M-H_2O)$^+$ (12), 381 (M-Me-H_2O)$^+$ (79), 329 (M-H_2O-C_5H_7)$^+$ (25), 303 (M-H_2O-C_7H_9)$^+$ (23), 275 (M-H_2O-C_2H_{13})$^+$ (12), 273 (M-$C_{10}H_{21}$)$^+$ (17) and 255 (M-$C_{10}H_{20}O$- H_2O)$^+$ (30).
^{13}C NMR ($CDCl_3$, 400 MHz, δ ppm): 140.9 (C-5), 121.9 (C-6), 71.9 (C-3), 56.8 (C-14), 56.2 (C-17), 50.8 (C-9), 50.4 (C-24), 42.6 (C-13), 42.4 (C-4), 40.3 (C-12), 39.5 (C-20), 37.3 (C-1), 36.6 (C-10), 36.3 (C-20), 35.6 (C-8), 34.0 (C-22), 33.0 (C-6), 32.1 (C-7), 32.0 (C-8), 31.8 (C-2), 29.3 (C-23), 28.2 (C-16), 26.2 (C-25), 24.3 (C-15), 23.1 (C-28), 21.1 (C-21), 21.1(C-11), 19.8 (C-27), 19.4 (C-19), 19.1 (C-21), 18.8 (C-26), 11.9 (C-29), 11.9 (C-18).

Quercetin (21)[31-35]
Pale yellow powder
M.P. 322-324°C.
IR ν_{max} (KBr): 3436, 2925, 1715, 1463, 1378, and 1028 cm^{-1}.
^1H NMR ($CDCl_3$, 400 MHz, δ ppm): 6.17 (1H, s, H-6), 6.37 (1H, s, H-8), 6.86 (1H, d, H-5), 7.62 (1H, d, H-6), 7.72 (1H, s, H-2)
MS m/z (rel. int. %): 302 (100), 273 (10), 153 (10), 137 (18), ($C_{16}H_{10}O_7$)
^{13}C NMR ($CDCl_3$, 400 MHz, δ ppm): 94.58 (C-8), 99.41 (C-6), 104.69 (C-10), 116.18 (C-2), 116.39 (C-5), 121.85 (C-6), 124.32 (C-1), 137.37 (C-3),146.38 (C-3), 148.19 (C-4), 148.93 (C-2), 158.41 (C-9), 162.67 (C-5), 165.72 (C-7), 177.50 (C-4)

Psoralen (2)[36]
Colourless needles
MP 162-163°C
^1H NMR (400 MHz, $CDCl_3$ δ ppm): 6.37 (1H, d, J = 9.6 Hz, H-3), 6.81 (1H, d, J = 2.4 Hz, H-11), 7.46 (1H, s, H-8), 7.66 (1H, s, H-5), 7.67 (1H, d, J = 2.4 Hz, H-12), 7.79 (1H, d, J = 9.6 Hz, H-4)
EIMS m/z (rel int): 186 (100, [M] $^+$), 158 (53), 130 (12), 102 (14)
^{13}CNMR (400 MHz, $CDCl_3$): δ ppm: 161.10 (C-2), 156.37 (C-7), 151.96 (C-9), 146.91 (C-12), 144.12 (C-4), 124.86 (C-6), 119.82 (C-5), 115.37 (C-10), 114.60 (C-3), 106.35 (C 11), 99.87 (C-8).

Umbelliferone (5)[36- 42]
Colorless prisms
MP 223-225 ^oC
UV nm (log e): 216 (2.71), 245 (3.55), 258 (4.10), 279 (4.17), 322 (3.78)
IR (KBr) nmax cm^{-1}: 3411, 1680, 1610
EIMS m/z 162 [M] $^+$, $C_9H_6O_3$
^1H-NMR (CD_3OD, 400 MHz δ ppm): 6.19 (1H, d, J = 3), 6.40 (1H, d, J = 1.2 Hz, H-1"), 7.26 (1H, dd, J = 8, 1.2 Hz, H-6), 7.29 (1H, d, J = 1.2 Hz, H-8), 7.30 (1H, d, J = 8 Hz, H-5), 7.62 (1H, d, J = 9.6 Hz, H-4)

13CNMR (Me2CO, 400 MHz): δ 161.4 (C-2), 112.6 (C-3), 144.8 (C- 4), 112.6 (C-4a), 130.4 (C-5), 113.8 (C-6), 162.2 (C-7), 103.1 (C-8), 156.8 (C-8a).

Schaftoside (49)[43]
Amorphous yellow powder
M.P. 222-224 °C
UV (λMeOH nm): 270, 330
IR (νKBr cm^{-1}): 3423, 2926, 1649, 1576, 1356, 1217, 1053
FAB-MS (*m/z*): 565 (M+1), 509（M+-H+-3 × 18), 467 (M+-H+-2 × 18-60), 429 (M+-H+-134), 345 (M+-2H+-2 × 18-60-121), 307，257, 219
^{1}H-NMR δ ppm:13.79 (s, 1H, 5-OH), 7.97 (d, *J* = 6.0 Hz, 2H), 6.92 (d, *J* = 6.0 Hz, 2H), 6.73 (s, 1H), 4.96 (d, *J* = 9.3 Hz, 1H, arabinose anomeric-H), 4.53 (d, *J* = 8.7 Hz, 1H, glucose anomeric-H), 4.00-3.00 (m, sugar-H)
^{13}C-NMR δ ppm: 182.3 (C-4), 163.6 (C-2), 161.2 (C-7), 161.2 (C-5), 160.8 (C-4'), 153.4 (C-9), 128.8 (C-2', 6'), 121.3 (C-1'), 116.0 (3', 5'), 109.3 (C-6), 103.7 (C-8), 103.0 (C-10), 102.5 (C-3), 79.4 (G-3, 5), 74.9 (A-1), 74.3 (G-1), 73.7 (A-3), 70.3 (G-4, A-5), 70.0 (A-4), 69.8 (A-2), 68.4 (G-2), 60.8 (G-6)

Isoschaftoside(50)[43- 47]
Yellowish powder
M.P. 239-240 °C
UV (λMeOH nm): 270, 330
FAB-MS (*m/z*): 565 (M^+ + 1), 547 (M^+ + 1-18), 511 (M^+ + 1-3 × 18), 475 (M^+ + 1-90), 427 (M^+ + 1-18-120)
^{1}H-NMR δ ppm: 13.82 (1H, s, 5-OH), 10.29 (1H, s, 7-OH), 9.19 (H, s, 4'-OH), 8.32 (2H, d, *J* = 7.9 Hz, 2', 6'-H), 6.92 (2H, d, *J* = 7.9 Hz, 3', 5'-H), 6.87 (1H, s, 3-H), 4.77 (anomeric-H), 4.72 (anomeric-H), 4.70-3.00 (m, sugar-H)
^{13}C-NMR δ ppm: 183.2 (C-4), 165.2 (C-2), 162.1 (C-7), 161.9 (C-4), 159.1 (C-4'), 156.1 (C-9), 130.6 (C-2', 6'), 121.9 (C-1'), 116.8 (C-3', 5'), 108.9 (C-6), 106.0 (C-8), 104.7 (C-10), 102.9 (C-3), 81.5 (G-5), 76.6 (G-3), 75.1 (A-1), 74.7 (G-1, A-3), 71.0 (A-5), 70.5 (G-4), 70.1 (A-4), 69.3 (A-2), 69.1 (G-2), 62.2 (G-6)

Rutin (11)[37]
Yellow powder
M.P. 210-213^{o} C
MS (m/z): 610 (M^+)
IR (KBr cm^{-1}): 3423 cm-1 (OH stretch) 2938 cm^{-1}, 2909 cm^{-1} (C-H stretch), 1457 cm^{-1} (C-H bend), 1656 cm^{-1} (C=O), 1505 cm^{-1} (C=C)
^{1}H NMR (400MHZ, $CDCl_3$): 12.6(s,1H,CHO), 7.57(s,5H,ArH), 6.87(d,1H,Ar-H), 6.4(s,1H,ArH), 6.2(s,1H,Ar-H)
^{13}C NMR (100MHZ,$CDCl_3$): 144.8(C-2), 133.41(C-3), 177.48(C-4), 161.33(C-5), 98.53(C-6), 156.73(C-7), 93.69(C-8), 100.84(C-9), 156.55(C-10), 121.70(C-^{11}), 116.70(C-2^{1}), 144.84(C-3^{1}), 148.5(C-4^{1}), 115.31(C-5^{1}), 116.36(C-6^{1}), 1101.32(C-^{111}), 74.18(C-2^{11}), 76.57(C-3^{11}), 68.33(C-4^{11}), 76.01(C-5^{11}), 67.09(C-6^{11}), 101.0(C-^{1111}), 70.52(C-2^{111}), 70.48(C-3^{111}), 70.67(C-5^{111}), 68.33(C-5^{111}), 17.72 C-CH_3.(C-^{11}and 3^{111} –sugars)

Xanthotoxin (8)[38]
White crystals
M.P. 146-147 °C
^{1}H-NMR ($CDCl_3$,300 MHz, δ/ppm): 4.29 (s, 3H, 9-OCH_3), 6.35 (d, *J*=9.5 Hz, 1H, H-6), 6.82 (d, *J*=2.0 Hz, 1H, H-3), 7.34 (s, 1H, H-4), 7.69 (d, *J*=2.0 Hz, 1H, H-2), 8.10 (d, *J*=10.0 Hz, 1H, H-5)
^{13}C NMR ($CDCl_3$, 100 MHz, δ/ppm): 61.2 (9-OCH_3), 107.7 (C- 3), 112.9 (C-4), 114.7 (C-6), 116.5 (C-4a), 126.1 (C-3a), 132.8 (C-9), 143.0 (C-8a), 144.3 (C-5), 146.6 (C-2), 147.7 (C-9a), 160.4 (C-7)

Bergapten (4)[48- 50]
White crystals
M. P. 188-190 ^{o}C
UV (MeOH) λ_{max} (nm): 210, 260 and 310
^{1}H NMR ($CDCl_3$) δ/ppm: 8.21 (1H, d, *J*=9.8 Hz, H-4), 7.71 (1H, d, *J*=2.8 Hz, H-7), 7.16 (1H, s, H-9), 7.10 (1H, d, *J*=2.8 Hz, H-6),6.30 (1H, d, *J*=9.8 Hz, H-3) and 3.82 (3H, s, OCH_3);
^{13}C-NMR ($CDCl_3$) δ /ppm: 21.9 (9-CH_3), 60.1 (4-OCH_3), 105.0 (C-3), 106.4 (C-4a), 112.5 (C-6), 112.7 (C-3a), 139.2 (C-5), 144.8 (C-2), 149.6 (C-4), 152.7 (C-8a), 158.4 (C-9a), 161.1 (C-7)

Stigmasterol (44)[51-53]
Color-white or off- white powder
M.P. 160-164 ^{o}C
UV λ max: 257 nm
IR ($CHCl_3$): 3320, 2946, 2854, 1480, 1388, 1189, 1096, 1035, 668 cm^{-1}
^{1}H NMR ($CDCl_3$) δ: 5.14 (m, 1H, H-6), 4.16 (s, 1H), 4.14 (s, 1H), 3.62 (tdd, OH, H-3), 1.27 (s, 3H), 1.19 (s, 3H), 1.07 (s, 3H), 0.99 (s, 3H), 0.91 (s, 3H)
^{13}C NMR ($CDCl_3$) δ: 140.80, 130.10, 128.60, 71.60, 58.10, 56.10, 52.10, 42.28, 40.28, 37.40, 33.40, 31.71, 28.40, 27.10, 24.10, 21.80, 19.10, 17.10, 15.10, 12.80
GCMS (m/z): 412 (M+, C29H48O), 55 (100), 394 (8), 255 (16), 213 (9), 199 (8), 159 (25), 145 (29), 133 (26), 121 (19), 105 (32), 91 (34), 83 (64), 81 (59), 69 (52), 41 (39)

Marmesin (35)[54, 55]
White crystal
M.P. 188-1900 ($CHCl_3$-petrol)
IR spectra: 3479, 2977, 2929, 1703, 1630, 1572, 1485, 1444, 1404 and 819 cm^{-1}
^{1}H NMR δ: 1.23 and 1.37(> CMe2, 1.85(1H, br), 3.23 (2H, br d, *J* 8.8 Hz, H2-1'), 4.74 (1H, t, *J* 8.8 Hz, H-2'), 6.21(1H, d, *J* 9.5 Hz, H-3), 6.74(1H, s, H-8), 7.22(1H, s, H-5), 7.59(1H, d, *J* 9.5 Hz, H-4)
MS m/z **(%)**: 246 (M+, 39), 213(20), 188 (75), 187(100), 175(15), 160(30), 131(19), 59(66), 43(7)
^{13}C-NMR (MeOD, 300 MHz) δppm: 165.2 (C-2), 112.1 (C-3), 146.2 (C-4), 127.3 (C-5), 125.0 (C-6), 163.7 (C-7), 111.9 (C-8), 156.8 (C-9), 114.0 (C-10), 72.3 (C-2'), 98.1 (C-3'), 92.5 (C-1"), 30.2 (C-2"), 25.9 (C-1"-CH3).

TRADITIONAL USES
The plant, *Ficus carica* Linn. possesses many therapeutic uses. Extracts of the plant were traditionally for internal as well as external use. *Ficus carica* Linn. is one of the important ingredient of 'Asoka cordial', the well accepted utero-tonic for mild to moderate type of uterine bleeding through the effective mode of action of its active ingredients *viz.* Fig, Asoka, Lodhra, Satawar *etc*. Traditional uses of figs are considered, including how figs or fig tree parts were processed as poultices from fresh or dried figs, poultices from fig leaves, fig wines, lye from fig tree bark, latex from stems and leaves. The juice of the fruit with honey was prescribed for checking haemorrhage (Vrindamaadhava). *Ficus carica* Linn. and *Juglans regia* (Akharot) from a good aphrodisiac tonic in unani medicine. Angir as a dry fruit is also considered a good nutritional support for diabetics.[19] These compounds bring styptic effect through its astringent action in controlling menorrhagia. *Ficus carica* Linn. is also used in the formulation of 'Stone crush', as a daily health supplement by keeping the urinary tract flushed, urolithiasis, crystal urea, burning following lithotripsy and urinary tract infections. Stone crush prevents recurrence after surgical removal of calculi, arrest formation of urinary calculi. Fruits of *Ficus carica* Linn. are used in leprosy, nose bleeding, antipyretic, aphrodisiac, lithontriptic, hair-nutritive, emollient, demulcent, laxative and in treatment of various inflammations, paralysis, liver diseases, chest pain, piles. Roots are used as tonic, leucoderma and ringworm infection. Latex is used as expectorant, diuretic, anthelmintic, anaemia. Leaves are used as antidiabetic, vermifuge, contact dermatitis in human, phototoxicity in animals. Seeds are used as edible oil, lubricant *etc*[56]. Our review of the medicinal uses of figs for potential cancer and diseases with cancer-related etiologies includes ancient, medieval and early modern herbals from the Middle East and Europe[57]. During the process of translation and dissemination, new plants and new medicinal uses were added based on the local plant lore and the physicians' own experiences. One of the oldest human activities is the study of plants and animals, particularly as a source of food[58].

MODERN USES
Commercially, figs are peeled by immersion for 1 min in boiling lye water or a boiling solution of sodium bicarbonate. In warm, humid climates, figs are generally eaten fresh and raw without peeling, and they are often served with cream and sugar. Peeled or unpeeled, the fruits may be cooked in various ways, as in pies, puddings, cakes, bread or other bakery products, or added to ice cream mix. Home owners preserve the whole fruits in sugar syrup or prepare them as jam, marmalade, or paste. Fig paste (with added wheat and corn flour, whey, syrup, oils and other ingredients) forms the filling for the bakery product. Other modern uses are as, poultice, eating, ointment, drink, gargle, simultaneously eating pickled figs, fumigation, rubbed externally, liniment, on sponge, enema, enema, skin application, ophthalmic *etc*[10].

PHARMACOLOGICAL ACTIVITY

Figs, the *Ficus* trees, are an understudied genus in modern pharmacognosy. For many centuries, however, figs have been used in medicine, and this use was recorded in classical Middle Eastern and European medical writings. The placement of poultices of figs on tumors as treatment for abnormal swellings. Such swellings, according to reports of experts, could have been due to infection or, alternatively, cancer[59]. Its pharmacological actions include antibacterial, antioxidant, anti-inflammatory, gastroprotective, antidiarrheal, vulnerary, antitumor, anticancer, antispasmodic, immunobalancing/ immunoharmonizing, and nutritive *par excellence*. Nowadays we know that even single pure chemicals can exert pleiotropic effects (Having multiple effects) on genes. This means that the compound can induce or suppress a gene to transcribe proteins and that this effect can reverberate downward to affect multiple human organs and multiple physiological systems. If such a multiple or pleiotropic effect is possible from a pure chemical, how much more so, then, is the potential for multiple physiological targeting from a mixture of different compounds[60].

The various extracts of the plant from different part showed many biological activites. Its fruit, root and leaves are used in the native system of medicine in different disorders such as metabolic, gastrointestinal, respiratory, inflammatory and cardiovascular disorders. *Ficus carica* Linn. has been reported to exhibit antioxidant, anti-HSV, haemostatic, hypoglycemic and hypo-lipidemic activities.

Free Radical Scavenging Activity

Yang *et al*, 2010 designed the method to study the ultrasonic-assisted extraction of total flavonoids from the leaves of *Ficus carica Linn.* and their scavenging activities against hydroxyl and superoxide anion free radicals[61]. The optimum conditions for extracting total flavonoids from the leaves of *Ficus carica Linn.* were found to be: ethanol concentration 40%, material-to-liquid ratio 1:60 (g/mL), extraction temperature 60 °C and length of ultrasonic treatment of 50 min. Under these optimum conditions, the extraction efficiency of total flavonoids reached as high as 25.04 mg/g. The total flavonoids extract from the leaves had marked scavenging effects on both hydroxyl and superoxide anion free radicals in a concentration-dependent fashion.

Cytotoxic effect on HeLa cell Line

Khodarahmi *et al*, 2011 reported that extracts of different species of *Ficus* are cytotoxic to some human cancerous cell lines[62]. Therefore, fruit, leaf, with ethyl acetate and dichloromethane and latex extracts were prepared through percolation and after 24 h incubation at 37°C, the cells were treated with different concentrations of the extracts or latex. The viability of the cells was determined by the reduction of 3-(4, 5-dimethylthiazol- 2-yl)-2, 5-diphenyl tetrazolium bromide (MTT) from formazan following 48 h incubation and the latex and different extracts of *Ficus carica* values of the ethanolic, ethyl acetate and dichloromethane extracts of the leaves and fruits.

Antifungal activity

Yan *et al*, 2010 took two high-molecular-weight fractions with antifungal activity, termed figinI and figinII were obtained from leaves of fig using a procedure including ion-exchange chromatography[63]. Low-molecular-weight extracts of fig (*Ficus carica* L.) leaves has antifungal and antibacterial activities against several types of microorganisms.

Biocontrol of bacterial pathogens

Balestra et al, 2008 reported *in vitro* and in *in vivo* tests, aqueous extracts from *Allium sativum* and *Ficus carica* fruits reduce the survival and the damages (disease incidence and disease severity) caused by bacterial pathogens of kiwifruit and of tomato plants[64]. *In vitro* tests, both vegetal extracts showed antimicrobial activity against all bacterial strains utilised at different concentrations (10^6 – 10^8 cfu ml^{-1}). *In vivo* tests *Allium sativum* and *Ficus carica* extracts confirmed their antimicrobial activity.

Hypotriglyceridaemic activity

Pérez *et al*, 1999 investigated the hypolipidaemic effect of an intraperitoneal (i./p.) administration of a *Ficus carica* leaf decoction[65]. The plasma total cholesterol levels, which were not modified, showed no significant differences in relation to baseline levels in the presence or absence of *Ficus carica* treatment either. The clearly positive results indicated the presence in the fig leaf decoction of a compound or compounds that influence lipid catabolism.

Anti-Angiogenic Activity

Mostafaie *et al*, 2010 investigated the anti-angiogenic and anti-proliferative potentials of *Ficus carica* latex extract using human umbilical vein endothelial cells (HUVECs) [66]. The results clearly indicated that latex extracts of *Ficus carica* contain strong anti-angiogenic and anti-proliferative activities. Therefore, latex extract

could be a candidate as a potential agent for the prevention of angiogenesis in cancer and other chronic disorders.

Erythropoitic effect

Lohar *et al*, 2009 reported about the erythropioetic activities of some medicinal plants found in India[67]: *Aegel marmelos, Asparagus recemosus, Boerhavia diffusa, Carissa congesta*, *Eugenia jambolana, Ficus carica*, *Phoenix sylvestris*, *Phyllanthus emblica, Spinaca oleracean*, *and Vitis vinifera* on Wistar albino rats. Fruit, leaf and root extracts of these plants were prepared and fed to experimental rat model for seven consecutive days to evaluate their effects on the haematological parameters such as red blood cells count (RBC count) and haemoglobin (Hb%). In the test, animals showed augmentation as compared to the controlled group of rats. Rats fed with fruit extracts of *Aegel marmelos, Carissa congesta*, *Eugenia jambolana, Ficus carica*, *Phoenix sylvestris*, *Phyllanthus emblica,* and *Vitis vinifera* separately showed increase in their haematological parameters. Obtained results indicate that most of the plant extracts boost synthesis of haemoglobin and formation of RBCs in the descending order: *Phyllanthus* emblica*, Spinaca oleracean* L*, Ficus carica* L.*, Phoenix sylvestris* L.*, Boerhavia diffusa* L*, Aegel marmelos* L.*, Vitis vinifera* L, *Eugenia jambolana* Lam*, Asparagus recemosus,* and *Carissa congesta.*

Antipyretic activity

Patil *et al*, 2010 studied the anti-pyretic 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[68]. A yeast suspension (10 ml/kg body wt.) increased rectal temperature 19 hours after the subcutaneous injection. The ethanol extract of *Ficus carica*, at doses of 100, 200 and 300 mg/kg body 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 body wt., *p.o.*), a standard anti-pyretic agent.

Anti-inflammatory activity

Patil *et al* 2011 reported the probable anti-inflammatory effect of petroleum ether (PEE), chloroform (CE) and ethanol (EE) extracts obtained from the leaves of *Ficus carica* Linn.[69]. Antiinflammatory activity was studied by carrageenan-induced rat paw edema and cotton pellet granuloma methods. The ethanolic extract 600 mg/Kg exhibited maximum anti-inflammatory effect, which is 75.90% in acute inflammation and in chronic studies showed 71.66% reduction in granuloma weight. The petroleum ether (PEE), chloroform (CE) and ethanol (EE) extracts significantly reduced carrageenan-induced paw edema and cotton pellet granuloma in rats. These extracts showed a greater anti-inflammatory effect comparative to standard drug Indomethacin.

Antimicrobial Activity

Jeong *et al*, 2009 investigated the antimicrobial activity of methanol (MeOH) extract of figs against oral bacteria[70]. The MeOH extract (MICs, 0.156 to 5 mg/ml; MBCs, 0.313 to 5 mg/ml) showed a strong antibacterial activity against oral bacteria. The combination effects of MeOH extract with ampicillin or gentamicin were synergistic against oral bacteria.

Immunomodulatory effect

Patil *et al*, 2010 reported the immunomodulatory effect of ethanolic extract of the leaves of *Ficus carica* (Moraceae) was investigated in mice[71]. The study was carried out by various hematological and serological tests. Administration of extract remarkably ameliorated both cellular and humoral antibody response.

Hepatoprotective activity

Gond *et al*. reported significant hepatoprotective activity with the petroleum ether (60-80˚) leaf extract of *Ficus carica* Linn. with rifampicin induced hepatic damage on rats[72]. The result of the biochemical tests revealed the elevation of serum enzyme level in rifampicin induced liver damage. A significant reduction was observed in SGPT, SGOT levels in the group treated with extract of *Ficus carica* Linn.*,* which showed liver protective activity.

Hypocholesterolemic activity

Canal *et al*. 2002 reported that the chloroform extract of *Ficus caraca* Linn. leaves extracts on the secretion and cell content of cholesterol in $HepG_2$ cells appreciately reduced the blood cholesterol level in streptozocin induced diabetic rats[73].

Antispasmodic activity
Gilani *et al*. 2008 reported that the ethanolic extract of the fruit of the plant (*Ficus carica* Linn.) showed significant spasmolytic effect by using rabbit jejunum preperations[74]. The data obtained in this study indicated that the fig possessed spasmolytic effect mediated possibly through K^+_{ATP} channel activation.

Haemostatic effect
Richter *et al*. 2002 found that ficin (mixture of proteases) present in latex of *Ficus carica* Linn. possessed the significant haemostatic effect by shortening the activated partial thromboplastin time and the prothrombin time[75]. This showed that the haemostatic potency of *Ficus* proteases was based on activation of human coagulation factor X.

Anticancer activity
Rubnov *et al*. 2001 reported a mixture of 6-*O*-acyl-β-D-glucosyl-β-sitosterols (where acyl moiety being primarily palmitoyl and linoleyl with minor amount of stearyl and oleyl) found in *Ficus carica* Linn. resin as potent cytotoxic agents[76]. Both the natural and the synthetic compounds showed *in vitro* inhibitory effects on proliferation of various cancer cell lines.

Antioxidant activity
Vinson *et al*. 1999 reported significant antioxidant activity in dried fruits of *Ficus carica* Linn. Dried figs are in vitro antioxidants after human consumption[77].These findings suggest that dried fruits should be a greater part of the diet as they are dense in phenol antioxidants and nutrients, most probably fiber.

Antiplatelet activity
Richter *et al.* 2002 reported the antiplatelet activity of *Ficus carica* Linn. which was studied by taking the blood from normal human volunteers reported to be free of medications for 1 week[75]. Platelet aggregation was induced with the agonists (adrenaline and ADP). The observed inhibitory effect of *Ficus carica* Linn. on adrenaline and ADP induced platelet aggregation at relatively lower doses (0.6 and 1.2 mg/mL. An active principal (ficin) from this plant was shown to possess haemostatic effect through activation of factor X.

Anthelmintic activity
Stepek *et al.* reported the anthelmintic efficacy of cysteine proteinases from fig (*Ficus carica* Linn.) *in vitro* using the rodent gastrointestinal nematode *Heligmosomoides polygyrus*. Within a 2h incubation period, cysteine proteinases, caused marked damage to the cuticle of *H. polygyrus* adult male and female worms, reflected in the loss of surface cuticular layers[78]. The efficacy and mode of action make plant as potential candidates for a novel class of anthelmintics.

Antidiabetic activity
Perez *et al*. 2003 studied the parameters of oxidative stress in normal and streptozotocin-induced diabetic rats, as well as in diabetic rats treated with aqueous and chloroform extracts of *Ficus carica* Linn. Leaves[79]. Plasma glucose and lipid concentrations were significantly higher in all groups of diabetic animals compared to control rats, and were partially reversed by treatment with *Ficus carica* Linn. chloroform extract.

CONCLUSION
The present study shows the traditional, pharmacological and phytochemical properties of various bioactive compounds present in *Ficus carica* Linn. The plant contains coumarins, flavonoids, sterols, triterpenoids, anthocyanins *etc*, in various parts of it. Its pharmacological actions include antibacterial, antioxidant, anti-inflammatory, gastroprotective, antidiarrheal, vulnerary, antitumor, anticancer, antispasmodic, immunobalancing/ immunoharmonizing, antidiabetic, antihelmintic, antiplatelet, hepatoprotective, anti-inflammatory and antipyretic activities. Further investigations should be conducted to isolate and characterize the active components of this plant.

Table 1: Phytoconstituents reported in *Ficus carica* Linn.

Phytoconstituents	Plant part	Class	Uses
4′,5′-Dihydropsoralen, Marmesin, Bergapten, Umbelliferone	Leaf	Coumarin	Sunscreen agent, cytotoxic, photosensitizer
Rutin	Leaf	Flavonoid	Anticancer, coloring agent
Bauerenol, 24-Methylenecycloartanol, ψ-Taraxasterol ester, Lupeol	Leaf	Sterol	Anticancer, antiprotozoal, chemopreventive, anti-inflammatory
Ficusogenin	Leaf	Triterpenoid	Anticancer, anti-inflammatory
Psoralen	Leaf, root	Coumarin	Sunscreen, tanning activator
β-Sitosterol	Leaf, root	Sterol	Hypolipidemic
Cyanidin-3-*O*-glucoside, Cyanidin-3-*O*-rhamnoglucoside	Fruit	Anthocyanin	antioxidant and radical-scavenging actions
6-*O*-linoleyl-β- D-glucosyl -β-Sitosterol, 6-*O*-Oleyl-β-D-glucosyl-β-sitosterol, 6-*O*-palmitoyl- β-D- glucosyl-β-sitosterol	Latex	Triterpenoid	Hypolipidemic

Fig.1: *Ficus carica*

(i)

(ii)

(iii)

(iv)

Fig. 2: *Ficus carica* Linn. latex, *Ficus carica* Linn. leaf, *Ficus carica* Linn. fruit, *Ficus carica* Linn. seeds

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