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The role of *Udumbara* (*Ficus racemosa Linn.*) unripe fruit in *Agnidushti* with reference to digestive system diseases.

Rajanee Vijay Jadhav, Sanjivani Shekhokar,

1. PhD Scholar,
2. HOD, , drsanjivanivs@gmail.com/+91 9422864732

Dravya Guna Dept., Government Ayurved College, Nanded, Maharashtra.

***Corresponding author:** drrajanee27@gmail.com/+91 9819624269

Abstract *Ayurveda* describes a healthy person as one who possesses an equilibrium of *Tridosha*, 13 types of *Agni*, and the excretion of *mala*, to balance the physical and mental state. *Agnidushti* leads to indigestion, colitis, diarrhoea, dysentery, nausea, vomiting, and metabolic disorders like diabetes and obesity. *Udumbara* has been known since the *Vedic* period and is used in *Ayurveda*, *Unani*, Homeopathy, and *Siddha*. Every part of the tree—including the root, sap, stem, stem bark, figs, and latex—is used in treatment. It is utilized in the form of the fruit as a whole, *swarasa*, *curna*, *ksheerapaaka*, *siddha* oil, *avaleha*, and *khalaka*. Interdisciplinary research has shown its antioxidant, hepatoprotective, hypoglycaemic, and gastroprotective activity.

Keywords: *Udumbara*, *agnidushti*, digestive system, metabolic disorder, polyphenols.

Introduction *Ayurveda* describes the triad of life as *Ahara*, *Nidra*, and *Brahma Carya*. A healthy person is one who possesses an equilibrium of *Tridosha*, 13 types of *Agni* (1 *Jatharagni* + *panchabhutagni* + *sapta dhatvagni*), and the excretion of *mala* to balance the physical and mental state[1]. *Agnidushti* leads to *mandagni*, *tikshanagni*, and *vishamagni*[2]. *Carakacarya* stated, '*Roga sarvepi mandagnau*'. *Aama* formation due to *mandagni* causes *srotorodha*, *balabhransha*, *anilmudhata*, *alasya*, *apakti*, and *malasanga*, which are the causative factors for indigestion, obesity, *shotha*, and *hrudroga*. *Tikshanagni* leads to a dry throat, acid indigestion, colitis, diarrhoea, dysentery, nausea, and vomiting. *Vishamagni* leads to low or high appetite, abdominal distension, flatulence, and constipation. *Ayurveda* treatment through diet, herbs, lifestyle, and detoxification helps greatly in the prevention of diseases associated with *Agnidushti*[3]. The digestive system comprises the entire tract from the mouth to the anus, along with accessory organs such as the liver, gall bladder, and pancreas. *Udumbara* is a plant seen mostly all over India and has been popular in indigenous systems of medicine since the *Vedic* period. Interdisciplinary research has further confirmed its antioxidant,

hepatoprotective, hypoglycaemic, and gastroprotective activity[4],[5].

Aim and Objectives The aim of the present study is to discuss the role of the unripe fruit of *Udumbara* in treating digestive diseases. The objectives include reviewing the pharmacological properties, nutrient profile, and therapeutic potential of *Ficus racemosa* as described in both *Ayurvedic* classical texts and modern scientific research,.

Methodology A literature search was conducted in *Ayurveda* classical texts, *nighantus*, and medicinal databases,. Modern scientific data were collected through search engines such as Google Scholar, PubMed, PubMed Central, and the Ayush Portal,.

Discussion In *Ayurveda*, *udumbara* is stated as *pramehahara*, *atisarahara*, *yonidoshahara*, *sandhanakara*, and *balya* due to its *kashayarasa* and *sheeta guna*. Figs of *Udumbara* contain primary metabolites, minerals, and phytoconstituents. Polyphenolic antioxidants, including dietary plant lignin, modulate the gut–brain axis. Phenolic compounds may help prevent or slow the progression of neurodegenerative diseases like Alzheimer's and Parkinson's. Lupeol is a triterpenoid possessing anticancer properties against a few neoplasms (e.g., colorectal, lung, and liver). Flavonoids, alkaloids, phenolics, saponins, and terpenoids have proven inhibiting activity against the alpha (α)-amylase and alpha (α)-glucosidase enzymes, as well as antimicrobial activity against *Staphylococcus* and *Bacillus cereus*. It is gastroprotective and used in gastric ulcers.

Ficus racemosa figs contain Glauanol, Hentriacontane β-sitosterol, Glauanol acetate, Tiglic acid, Esters of Taraxasterol, Lupeol acetate, Friedelin, Phytosterol, Tannins, Steroids, Flavonoids, and Alkaloids. The phytochemicals present in the fruit of *F. racemosa* exhibit hypolipidemic, anti-diabetic, anti-carcinogenic, and anti-leukorrhea effects. The fruit also contains latex, which includes α-Amyrin, β-sitosterol, cycloartenol, cycloeuphordenol, 4-deoxyphorbol and its esters, euphorbinol, Isoeuphorbol, palmitic acid, taraxerol, tinyatoxin, and trimethyl ellagic acid. These phytochemicals have been reported to exhibit activities such as antipyretic, anti-inflammatory, and anti-microbial properties[6],[7].

Nutrient Property[8] The unripe fruit of *Udumbara* is *kashaya*, *sheeta*, and *guru*, while the ripe fruit is *madhur*, *sheeta*, and *guru*. Both are *brumhana* in nature. The *Katyayanasutra* advised living in *Udumbara Bahula Pradesh* for *mula* and *phala bhakshanartha*. For a *Kshatakshina* person, the fruit is advised with *goghruta* and *shalyodana* for *bruhana*. The *Shivaprakasha Vyakhya* praised it as a nutrient like no other. *Madanadi Nighantu* described the ripe fruit with *swadu majja*, *snigdha*, *shleshma*, *krumi*, *shukra vivardhana*, and *durjara*. *Udumbara* tree plantation is advisable as travelers can eat the fruits, where they act as *kshudhahara*. *Shaligram Nighantu* described its four stages and how its property changes with each. Small unripe fruit is *kashaya*, *stambhanakara*, and beneficial in *trusha*, *pittaja*, *kaphaja*, and *raktaja* diseases. Medium-sized green unripe fruit is sweet and *kashaya rasatmaka*, *sheeta*, *pittahara*, *trushahar*, *modakara*, *raktasrutihara*, and *vamihara*. It also appears in the diet of chimpanzees and other frugivorous vertebrates like elephants and hornbills[9].

The Antipyretic Activity[10], [11] *Charakacharya* described the taste of *kashaya*, *madhura*, and *amla rasatmaka* as *guru* and *vaatala*. In *Jwara chikitsa*, *shalatu* having *sheeta* property is used; *siddha taila* is prepared and advised for *abhyanga* and *parisheka*, while the powder is used for *avacurnana* to reduce burning. *Ashtanga Hrudaya* mentioned it under *kashayaskandha*. *Udumbara phala* with sugar is used in *Pittaja trushna* and in *shushkavrana* for *utsadanartha*. The plant possesses antipyretic activity due to the presence of

flavonoids, triterpenes, and phenols. The antipyretic property of the *Udumbara* root, bark, and leaves has been proven in a rat model[12]. *Terminalia chebula* and *Ficus racemosa* ethanolic extracts effectively inhibit the Las R protein and virulence factors of the bacterium *Pseudomonas aeruginosa*[13].

The Antidiarrheal Property *Udumbara* fruit is *samgrahi*, *stambhanakara*, *guru*, and *sheeta* in property. In *Pari Kartika vyapada* due to *aama* and *ajirna*, *kwatha* of *Udumbara* fruit is used in the form of *picchabasti*. *Udumbara* is one of the ingredients of *Atisaradi ghruta*, indicated in *Pittatisara* and *Raktatisaara* when *pavana atipravrutti* is seen. It is advised to be given with *yavagu*. In *Grahani chikitsa*, to treat *atyagni*, *payasa* prepared with *Udumbara phala* or *twaka* is advocated. In *bhasmaka roga*, the *Udumbara* fruit is advised. Its high tannin and flavonoid content provide a protective, astringent effect on the intestinal mucosa, reducing fluid accumulation and gut motility.

Gut Health and Antioxidant Interaction Polyphenol supplementation increases health-promoting microbiota—*Lactobacillus* and *Bifidobacterium*—and decreases pathogenic species like *Clostridium*[14]. *Ficus racemosa* fruit polysaccharides are potent antioxidants and antidiabetics, and they are easily bio-accessible during digestion. High-prebiotic fiber in the fruits is good for gut bacteria and can reduce stress hormones in humans. Ficin, a cysteine proteolytic enzyme found in the latex, is higher in unripe fruits and destroys roundworms and hookworms[15]. *Udumbara kwatha* is used in *Pittaja arsha*, *vranashotha*, and *suddha vrana* for *parishecanartha*. In *Kaphavikaara* or *Pittavikaara*, it is an ingredient in *Asthapana basti*.

The Wound Healing Property[16], [17], [18] *Sushruta* classified *Udumbara* under *nyagrodhadigana*, which is *vranya*, *sangrahi*, *bhagnasandhanakara*, *dahahara*, *mehahara*, and *yonidoshahara*. The *Vranya* property is due to its *sheeta* and *kashaya rasa*. In modern science, wound healing is a collaboration of antimicrobial, anti-inflammatory, antiseptic, anti-hemorrhagic, and antioxidant properties. Gallic acid from the fruit reduces oxidative stress and inhibits pathogens like *Streptococcus* and *Staphylococcus*[19].

Gastroprotective and Anti-ulcer Activity Flavonoids and tannins help scavenge free radicals and inhibit lipid peroxidation, which are key factors in gastric ulcers caused by oxidative stress[20],[21]. Fig latex is applied in the treatment of gingivitis and dental abscesses[22]. Raft formulations containing *Ficus racemosa* fruit extract have shown floating durations of up to 5 hours for treating GERD[23]. In ulcerative colitis, *Udumbara kwatha* with *kutaja ghanvati*, *musta*, *nagkeshara*, and *mukta* gave significant results, reducing steroid doses and increasing hemoglobin levels[24].

The Antioxidant Property[25], [26], [27], [28] Polyphenols in plants inhibit reactions that damage cell proteins and DNA, combating oxidative stress related to heart disease, cancer, and neurodegenerative diseases. Racemosic acid showed potent inhibitory activity against COX-1 and 5-LOX and demonstrated strong antioxidant activity[29].

The Antidiabetic Property[30], [31], [32], [33], [34] In *Shodhala Samhita*, the fig is used for *Prameha pitika* for *lepana*. *Kaiya Deva Nighantu* described its property as *shleshmaghna*. The Bodo tribe in Assam traditionally uses the fruit extract as a preventive remedy for diabetes. *In silico* docking studies confirmed that terpenoid compounds like beta-sitosterol and friedelin interact with hyperglycaemic targets. Extracts showed maximum inhibitory activity against alpha-amylase and alpha-glycosidase enzymes[35].

The Neurodegenerative Property[36], [37] Anti-neurodegenerative compounds protect nerves from damage by reducing inflammation and oxidative stress. Fig fruits are used in

inflammatory diseases and for increasing intellect and mental capability.

Antihaemorrhagic Activity[39], [40] In the 5th month of pregnancy, it is used to stop bleeding and prevent abortion due to *aama*. In *Vaataja Raktapitta*, it is advised to cook *Tittira mamsa* with a decoction of *Udumbara* fruit. It is used in *Raktatisar*, *Raktarsha*, epistaxis, and *Raktaja Cchardi*. *Udumbara kwatha* is given in *Raktagat visha*. Ficin acts as an antidote for snakebites. *Ksharagada* contains *Udumbara phala* or *twaka bhasma* for *dundumbhi* and *pataka lepanartha* in *janapadodhwansa*.

The Anticancer Property[41] and Antiobesity Property[42], [43] Methanol extracts of the fruit have shown anticancer properties against human hepatocellular carcinoma (HepG-2) cells. Additionally, the fruit extract showed high pancreatic lipase inhibitory activity, suggesting its use as a drug for obesity.

Further Observations *Udumbara* trees are common, and the fruits are easily accessible. The fruits are rich in proteins, iron, calcium, and phosphorus compared to *Ficus carica*. It has immunomodulatory and hepatoprotective activities[44],[45]. Various forms like *swaras*, *kwath*, *ksheerapaaka*, *kshara*, *siddha* oil, or *ghrut* can be administered orally or via *basti*, *picu*, *nasya*, and *dhumrapaana*. Phytochemicals, mainly phenols, have numerous biochemical reactions, though their exact metabolism and bioavailability vary based on endogenous factors[46].

Conclusion The use of *Udumbara* unripe fruit as medicine has been documented from the *Vedic* period to the modern era. Toxicity studies have shown that the extract is safe up to 5g/kg[47]. Beyond its medicinal properties, *Udumbara* fruit is nutritious and provides essential dietary elements. Therefore, it represents the cheapest and most easily available nutrition for children, pregnant women, travelers, and malnourished patients with cancer, diabetes, HIV, or Koch's. The inhibiting ability of free radicals and glycaemic enzymes increases the probability of developing new dietary nutraceuticals from *Ficus* fruits. This study was limited to the use of the unripe fruit. While it has been used for thousands of years, there is a need for more pharmacokinetic and clinical trials in humans to provide further evidence.

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