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FIG (FICUS CARICA): A HIGHLY NUTRITIOUS FRUIT

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ABSTRACT

Ficus carica, the scientific name for figs, is a fruit of enormous botanical, nutritional, and therapeutic value. This study article offers a thorough investigation of figs, providing details on their taxonomy, production, nutritional makeup, and several health advantages. Figs have been cultivated and consumed for thousands of years, making them significant to the past and cultures of many different countries. Figs, being rich in dietary fibre, essential vitamins, minerals, and potent antioxidants, are a crucial food item for preserving overall well-being. The article explores the nutritional value of figs and emphasises how they may improve digestive health, treat long-term health issues, and promote general wellbeing. Flavonoids and phenolic compounds, two bioactive chemicals with anti-inflammatory and antioxidant characteristics, are present in figs. These compounds may have potential use in the management of inflammation, oxidative damage, and associated disorders. Figs are also a great source of prebiotic dietary fibre, which supports the upkeep of a balanced gut flora. Their longstanding application in herbal therapy to treat a range of illnesses emphasises their therapeutic value even more. But it's important to stress that because figs naturally contain sugar, eating them should be done so in moderation as this might lead to an excessive intake of calories. This review study summarises the body of research on figs and emphasises their complex function in human nutrition and health. To fully investigate their potential and clarify their unique methods of action in diverse health scenarios, more study is required.

Keywords: Fig, Ficus carica Linn, phytochemistry, nutritious fruit and pharmacological activities.

INTRODUCTION

The universe cannot exist without plants. Plants have long been utilised by humans as a source of medicine. The use of medicinal plants for therapy dates back to early human civilization. after a variety of These plants have been shown to be a substantial source of medication through observations and tests (Marwat et al., 2009). Ficus palmata, sometimes referred to as "Phegra or fig," is a moderately large, deciduous tree that grows to a height of 6 to 10 metres. It belongs to the Moraceae family and the 750-species Ficus genus (Joshi et al.,

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2014). Although it may be produced in more humid areas, such as the tropics and subtropics, figs are typically grown in Mediterranean climes. Only 26% of the world's figs are produced in Turkey, while combined, Egypt, Iran, Greece, Algeria, and Morocco account for about 70% of global fig output (FAO, 2006). The western regions of Maharashtra (Pune), Gujarat, Uttar Pradesh (Lucknow and Saharanpur), Karnataka (Bellary, Cnitradurga, and Srirangapatna), and Tamil Nadu (Coimbatore) are the main places in India where it is cultivated. Important fig types growing in India include Brunswick (Magnolia), Dinkar, Poona Fig, Conadria, Deanna, Excel, Celeste, and Brown Turkey. Once planted, figs are quite resistant to drought, and commercial production is recommended during the dry, hot summer months. However, consistent watering is necessary to get better yields (Gousia et al., 2018). Fig (Ficus Carica) is a classic Mediterranean species found in India. Because of their nutritional and therapeutic qualities, figs are a significant part of the diet (M. Flaishman 2008). This diet is considered to be among the healthiest and is connected to lifespan. Figs are low in fat and cholesterol and strong in antioxidant activity. They are also an excellent source of nutritional fibre, vitamins, minerals, and polyphenols. Their low moisture content guarantees a reduced chance of microbial deterioration, making large-scale production and distribution feasible. The main goals of fig fruit, according to Vinson JA (1999), are to produce easy fruit products and high-quality goods with good flavour, colour, texture, and taste.

Figure 1: Dried Fig

Tabel 1: Scientific Classification

Domain	Eukaryota
Kingdom	Plantae
Subkingdom	Viridaeplantae
Phylum	Tracheophyta
Subphylum	Euphyllophytina
Infraphylum	Radiatopses
Class	Magnoliopsida
Subclass	Dilleniidae

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Superorder	Urticanae
Order	Urticales
Family	Moraceae
Genus	Ficus
Species	Palmata

Source: Sirisha et al. (2010)

BOTANICAL DESCRIPTION

The F. Carica L. tree often grows to a height of 15 to 20 feet, with many spreading branches and a trunk that is more than 7 feet in diameter. The plant produces a milky-white latex that is mostly made up of the protein hydrolytic enzyme ficin. The species name carica refers to leaves that resemble papayas.

Leaf

Bright green, solitary, alternating, and big leaves that often reach a length of one foot are present. They have one to five sinuses and are deeply lobed, with soft hairs on the underside and tough hairs on the upper surface. The blooms, which emerge from the axils of old leaves, are visible in receptacles.

Flower

Male flowers occupy the lower half of the receptacle, while female flowers occupy the top section. The mature receptacle, Saikonium, has many tiny, white seeds in it.

Seeds

There can be anywhere from 30 to 1600 seeds per fruit, and they might be tiny, small, medium, or huge. Unless pollinated, the edible seeds are usually hollow. The distinctive nutty flavour of the dried figs is derived from the pollinated seeds. The inside part is a white inner ring that is sealed with jelly-like flesh and contains a seed mass.

Fruit

Figs are typically pear-shaped, paired, or solitary, and they are axillary on leafy branchlets. The reproductive systems and fruit (figs) of species belonging to the genus Ficus are exclusive. Only the agaonid wasps (Hymenoptera: Chalcoidea: Agaonide) affiliated with them are able to pollinate it, and these wasps can only deposit their eggs within the fruit that they are related with. The presence of a pollinator wasp is necessary for the proper pollination and reproduction of F. carica species (Janzen, 1979). Conversely, agaonid wasps require the presence of their linked species of F. Carica in order to reproduce successfully. When compared to apple pulp, fruit skin provided the majority of the phytochemicals and antioxidant activity.

Root

The plant usually has a shallow, spreading root system (Badgujar et al., 2014). Occasionally spanning 50 feet of ground, although certain roots in porous soil can drop as low as 20 feet (Chawla et al., 2012).

Bark

There is smooth bark. The exterior bark has uneven, spherical flakes that have been exfoliated, and its colour ranges from ash to silvery grey. The centre region of the bark has a brownish or light reddish brown look. Layers of granular tissue with an orange-brown or light yellowish colour make up the interior portion (Badgujar et al., 2014).

NUTRITIVE VALUES

The composition of raw figs is little fat, 19% carbs, 1% protein, and 79% water. For every 100 grammes (74 calories), they provide 14% of the Daily Value, or DV, of dietary fibre, making them a moderate source. When dried to 30% water, figs have a 64% carbohydrate, 3% protein, and 1% fat composition (Yang et al., 2009). Dried figs are high in dietary fibre (almost 20% DV) and the important mineral manganese (26% DV) in a 100-gram meal that provides 249 calories. Additionally, they have a rather high level of magnesium, potassium, calcium, iron, and vitamin K (Nutrition data, 2021).

RECOMMENDED DAILY INTAKE

Based on data from the Food and Nutrition Board of the U.S. Institute of Medicine's Dietary Reference Intakes (DRI) published in 2009 (VMR, 2009) and The composition of nutrients in dried figs (Vinson et al., 2005, Solomon et al., 2006), According to research, dried figs provide the following nutrients per 100 g serving: iron (30%), calcium (15.8%), potassium (14%), thiamin (B1) 7.1%, and riboflavin (B2) 6.2%. Figs are low in fat and cholesterol, and they also contain no salt (Weibin et al., 2001, Solomon et al., 2006). At least 17 different kinds of amino acids are found in figgy fruits, with glutamine and aspartic acid having the greatest concentrations (Weibin et al., 2001, Solomon et al., 2006). Additionally, compared to all other popular fruits, dried figs have unusually high levels of crude fibres (5.8%, w/w) (Vinson et al., 2005, Solomon et al., 2006). Soluble fibre, which makes up more than 28% of the fibre, has been demonstrated to help with weight reduction, blood sugar and cholesterol regulation, and management. Among the frequently eaten fruits and drinks, dried figs have one of the highest quantities of polyphenols (Vinson et al., 2005, 13, Solomon et al., 2006).

TRADITIONAL AND CURRENT USES

For its therapeutic properties as an antispasmodic, anti-inflammatory, metabolic, cardiovascular, and respiratory treatment, F. carica has been utilised historically (Duke et al., 2002; Werbach, 1993). It's commonly referred to as "Fig." The local medical system treats a range of ailments, including gastrointestinal (colic, indigestion, diarrhoea, and loss of appetite), respiratory (sore throats, cough, and bronchial issues), inflammatory, and cardiovascular by the use of the leaves, fruits, and roots of F. carica. (Burkill, 1935; Penelope, 1997). F. carica fruits can be consumed raw, dried, or preserved as jam. Since figs are low in fat and cholesterol and high in amino acids, they are utilised as a great source of minerals, vitamins, carbs, and dietary fibre (Slatnar et al., 2011, Veberic et al., 2008, Solomon et al., 2006). Additionally, figs have reportedly been traditionally utilised as laxatives, antispasmodics, pulmonary, cardiovascular, and anti-inflammatory medicines (Guarrera, 2005). For haemorrhage, F. carica fruit juice is combined with honey. Fruits are employed as a moderate laxative, expectorant, and diuretic in Indian medicine (Solomon et al., 2006). It

helps with conditions of the spleen and liver. For diabetics, the dried fruit of F. carica is a supplemental food. Because of its high sugar content, it is marketed as sweet in the market (Veberic et al., 2008). Fruit paste is used to treat inflammation, tumours, and swellings to reduce discomfort.

MEDICINAL USES

Figs have long been utilised in medicine to treat a wide range of conditions, such as cardiovascular, respiratory, antispasmodic, and anti-inflammatory disorders (Duke et al., 2002). According to Penelope (1997), Certain substances present in fig leaves and roots have been demonstrated to be beneficial against a range of ailments, such as respiratory (cough, bronchial difficulties, diarrhoea, and ulcers), gastrointestinal (colic, indigestion, diarrhoea, and lack of appetite), inflammatory, and cardiovascular. The laxative properties of figs, both fresh and dried, as well as their syrup, have long been recognised (Morton, 1987). Figs can help with liver and spleen disorders and are beneficial for eye health (Anonymous, 2007). According to reports, there are some medicinal benefits to fig extract for diseases including cancer., helminth infection, hypercholesterolemia, hypertriglyceridemia, hyperglycemia, and bovine papillomatosis (Guarrera, 2005). Fig latex is used topically for warts, wounds, and skin ulcers; it's also a purgative and vermifuge.

BIOLOGICAL ACTIVITIES

Anti-cancer activity

F. carica has anticancer effects by preventing the proliferation of several cancer cell lines. A research was conducted to examine the anticancer impact of latex at various concentrations. The results demonstrated that a dosage of 5 mg/ml produced the greatest impact on preventing the growth of cancer cell lines in the stomach. According to other studies, latex and its derivatives have been demonstrated to inhibit tumour development and spontaneous growth. Examining the cytotoxicity of fruit and leaf extracts and latex on HeLa cell line, the findings demonstrated that latex and other extracts might decrease the survival of HeLa cells in a dose-dependent way, even with levels as low as 2 µg/mL (Rahmani et al., 2014).

Anti-angiogenic activity

Using human umbilical vein endothelial cells, the anti-angiogenic and anti-proliferative effects of Ficus carica latex extract (HUVECs). The findings unequivocally demonstrated the potent anti-angiogenic and anti-proliferative properties of Ficus carica latex extracts. Consequently, latex extract perhaps a prime choice for future use as an agent to stop angiogenesis in cancer and other chronic illnesses (Richter et al., 2002).

Diabetes

Diabetes mellitus is a metabolic disorder that is increasingly frequent in both industrialised and developing countries, which worries health specialists. In 1985, the World Health Organisation calculated that 30 million people worldwide suffered from diabetes. According to the WHO, that number rose to 135 million in 1995, and by 2025, 300 million people are anticipated to be impacted (WHO, 2016). The fight against diabetes and its consequences is an international health issue. The availability, affordability, and absence of negative side

effects of plant-based pharmaceuticals for the management of diabetes disorders have drawn an abundance of interest recently. Many medicinal plants have been utilised in traditional medicine by many cultures worldwide to treat long-term diabetes-related problems. From medicinal plants, almost 200 pure bioactive substances, including as starches, polyphenols, and triterpenoids, have been isolated. Because these substances regulate blood sugar levels, they've potent antidiabetic effects (Mahmoudi et al., 2016). Approximately 850 species exist in the Moraceae family, which comprises the genera Ficus, trees, shrubs, vines, and epiphytes. The greatest diversity of these trees, shrubs, plants, and epiphytes may be found in Southeast Asian humid and subtropical areas, tropical America, and Australia (Misbah et al., 2013). Several uses for ficus species include a range of medicinal uses in Siddha, Ayurvedic, and & conventional Chinese medicine (Lansky et al., 2008). Fruit shrub F. carica, native to Asia Minor, is widespread in tropical and subtropical areas. Numerous illnesses, such as diabetes, liver problems, gonorrhoea, menstrual pains, Plants may be used to cure a variety of illnesses, including nausea, ulcers, and cough (Badgujar et al., 2014).

Antioxidant Activity

Many of the phenolic chemicals that are present in F. carica are involved in a wide range of plant physiological processes. Some of them are also good for human health since they may serve as antioxidants in a number of methods such as donating hydrogen, reducing substances, scavengers of free radicals, singlet oxygen quenchers, and so on. We examined the entire amount of polyphenols that are total flavonoids, capacity for antioxidants, and anthocyanin profile of fig fruits of F. carica using six commercialised fig varieties: black, red, yellow, and green. The antioxidant capabilities were established by use of the ferric reducing antioxidant approach. Fruits contained the highest quantities of polyphenols, flavonoids, and anthocyanins as well as an excellent antioxidant capacity (Caliskan et al., 2011; Mawa et al., 2013).

CONCLUSION

In brief, this review study has provided an in-depth analysis of the several facets of anjeer (fig) and its significance for human nutrition and well-being. Anjeer is not only a tasty fruit but also has a rich cultural history and is an excellent source of minerals and other bioactive compounds with various health benefits. Anjeer is a great source of fibre in your diet, mineral content, vitamins, and phytonutrients. Research has been done on the capacity to treat chronic health conditions like diabetes, overweight, and coronary artery disease. The prebiotic properties of anjeer, which support digestive health, are noteworthy. Moreover, the fact that it is a traditional remedy for a number of ailments highlights how important it is to natural medicine. The anti-inflammatory and antioxidant benefits of anjeer, primarily attributed to components like flavonoids and phenolic compounds, have been the subject of significant debate. These qualities may be responsible for its ability to combat oxidative stress, inflammation, and free radical damage in the body. However, it's crucial to keep in mind that, similar to other foods, anjeer should only be consumed infrequently. Certain medical disorders should not be treated with a high sugar consumption since it may result in weight gain. In these circumstances, overindulgence in consuming ought to be avoided. In a nutshell anjeer is a fruit that has several uses and many health benefits. It has long been a

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staple of human diets and continues to be a popular choice for anybody wishing to incorporate something savoury and healthy into their meals.

SUGGESTIONS FOR FUTURE RESEARCH

Even though more research is required to fully explore the potential of anjeer in preventing and managing different health conditions, the evidence that is currently available suggests that future fig research should concentrate on an assortment of topics in order to increase our understanding of the potential advantages and applications of this fruit. Here are some suggestions for prospective future research topics:

1. Nutritional Analysis and Varietal Differences: Examine the nutritional makeup of several fig kinds and look for any differences in the number of antioxidants, bioactive compounds, and important nutrients that each variety has. Making educated decisions may benefit manufacturers and customers by being aware of these distinctions.

2. Health Benefits and Disease Prevention: Perform epidemiological research and clinical trials to find out which health issues may be prevented and managed by consuming figs. It might be especially beneficial to do research on its possible effects on weight control, cardiovascular health, and diabetes management.

3. Antioxidant and Anti-inflammatory Mechanisms: Examine the underlying processes that give figs their anti-inflammatory and antioxidant qualities. This can entail in-depth research on the bioactive substances found in figs and their relationship to biological processes.

4. Prebiotic Effects and Gut Health: Examine how eating figs affects the gut flora and the prebiotic benefits it offers. Gaining knowledge on how figs promote gut health may have wider effects on digestive health and general wellbeing.

5. Processing and Preservation Techniques: Provide and enhance methods for preparing and storing figs that preserve the fruit's flavour and nutritional value. Food waste may be decreased and the food sector may profit from this research.

6. Bioavailability of Nutrients: Examine the figs' bioavailability of important nutrients and bioactive substances. Determining these ingredients' actual effects on human health requires knowing how well the body can absorb and use them.

7. Culinary and Culinary Applications: Discover creative ways to prepare figs in both traditional and modern cuisine. Look for ways to add figs to different recipes to improve flavour and nutritional content.

8. Genetic and Breeding Studies: The identification and development of cultivars with enhanced qualities, such as disease resistance, yield, and nutritional content, can be facilitated by genetic studies on fig plants. Breeding initiatives aimed at improving figs might provide more robust and nutrient-dense cultivars.

9. Environmental Impact and Sustainable Cultivation: Examine how growing figs affects the environment and look at sustainable farming methods that cut down on resource use and the carbon footprint of fig production. Applications in Pharmacies: Examine the potential of chemicals obtained from figs for use in pharmaceutical applications, such as the creation of natural cures or drugs for particular medical ailments.

10. Consumer Preferences and Market Research: To ascertain the desires of the market of figs and fig-related items, do market research and surveys. This can direct the food industry's marketing plans and product development.

11. Cultural and Historical Significance: Examine the historical and cultural relevance of figs in various civilizations. Understanding the traditions and background around figs can provide important context for understanding their continued value. including this fruit into a well-balanced, diversified diet.

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