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Nutrition Facts and Health Benefits of *Carica Papaya*

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ABSTRACT

The tropical fruit *Carica papya* L. is widely farmed due to its excellent nutritional and medicinal value. Papain, flavonoids, alkaloids, tannins, and minerals like potassium and magnesium are all exist, along with the crucial vitamins A, B, C, and E. These components possess antioxidant, antibacterial, anti-inflammatory, and anti-cancer properties. Papaya helps treat chronic illnesses including diabetes, cancer, and heart issues while also enhancing immunity and digestion. Both business and medicine make use of its papain enzyme and seed oil, which is rich in monounsaturated fatty acids. This review emphasises the nutritional composition, health-promoting qualities, and restorative potential of *C. papaya*, highlighting its significance as a natural bioactive food that supports overall health and wards against disease.

Keywords: Antioxidant properties, Nutritional composition, Enzymatic activity, Immunity booster

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Introduction

The papaya (*Carica Papaya L.*) is a fruit tree native to tropical America. It is cultivated throughout the equatorial and sub equatorial world. In the recent report 2020 on papaya production, india is the gigantic manufacturer of papaya in the world with 13.9 million tonnes (mt)/year, which account for 43% worldwide yield [1]. It is rich in biological catalysts and active ingredients such as a variety of components, it can resist cancer aging and the heart healthy beneficial effects. It's a delicious fruit, and packed with vital vitamins and minerals which can cover wide range of the nutrient rich characteristics [2]. It is also a valuable origin of powerful redox regulators such as vitamin E, B, A and C; minerals like magnesium and potassium. It has folate and pantothenic acid as well as fiber [3]. It has papain, a gastrointestinal enzyme that effectively preclude allergies, wounds, and sports-related injuries. Bioactive substances including Alkaloids, flavonoids, phytosterols, tannins, phenolics, and saponins are abundant in its leaf extract [4]. Nutritionists and food scientists should pay close attention to endeavor to promote the health benefits of crops because a large number of people are suffering from chronic illnesses linked to diet. WHO states that tobacco use, unhealthy diets (junk foods), hazardous alcohol use, and a lack of physical activity have all played a part in the rise in NCDs. Thus, the purpose of this article is to encourage papaya fruit's nutritional value and health advantages [5]. Colon infections and gastrointestinal disorders like dyspepsia and celiac disease, in which patients are unable to metabolize wheat protein gliadin but can survive under it if given proteolytic enzyme can be alleviated by papaya juice. In actuality, papain and chymopapain are two significant papaya compounds that are widely beneficial for gastrointestinal tract disturbances and digestive disorders. Unrefined oil isolate from papaya seeds had a elevated content of unsaturated fatty acids (78.17%), the majority of which were MUFA (71.89%), according to physicochemical characterization and fatty acid composition analysis. Papaya kernel oil may therefore have applications in nutrition due to its advantageous monounsaturated fatty acid profile [6].

Table 1: Nutritional Composition of Carica Papaya [5, 7]

Dietary Components	100g
Total energy	163kj
Carbohydrate	7.2g
Protein	6g
Fat	0.1g
Fiber	0.8g
B-carotene	13.04mg
Sodium	3mg
Vitamin E	3.13mg
Thiamine	0.05mg
Riboflavin	0.05mg
Niacin	0.34mg
Pyridoxine	0.15mg
Folate	39.0mg
Calcium	17mg
Phosphorus	5.0mg
Magensium	10mg
Iron	0.23mg

Phytochemical Components

The growing location, cultivar variation, exposure to sunlight, ripeness stage, and agricultural practices all have a significant impact on the phytochemical compounds of *C. papaya* trees. and handling after harvest. A distinct portion of *C. papaya* (fruit juice, ovules, milky sap, leefages, roots, peel, and fruits) are composed of a variety of biologically active substances. Fruit from the *C. papaya* plant is a valuable source of provitamin A and antiscorbutic factor. The variance in L-ascorbic acid and retinol precursor is a result of variations in fruit ripeness, growing place and variety. It has been identified as one of the fruits with the highest ascorbic content, with an average of 40 and 60 mg/100 g undried weight, with findings showing approximately 154 mg/100 g fresh weight. Chlorophyll reduction is correlated with carotenoid synthesis. Fruits start to ripen which results in a noticeable tone variation from green to amber [8]

Health Perks of *C. Papaya*

Papaya has a prolonged history of heritage deploy in the management of gastroenterological and digestive disorders. The latex protease Papaya's enzyme has been demonstrated to help with the gastrointestinal processing of protein and has been administered to treat indigestion in ethnomedicine. Additionally, unripe papaya leaf tea has been utilized in customary medication for its many curatives effects, such as helping with metabolism [9]. Another fascinating outcome is the tranquilizer and anxiety-lowering qualities of

Papaya was reported by [10]. These effects might be brought on by papaya's antioxidant properties. An enzyme called papain, which is extracted from unripe papayas, was discovered to has a capable redox potential. Free Radical scavengers support to alliviate oxidative injury is a major benefactor to the innovation of a number of illnesses, such as depression and stress. These results collectively imply that papaya may have aptitude remedial properties for a variety of illnesses, such as enteric illnesses, heart conditions and psychological stability. Nevertheless, additional study is required to fully comprehend the mode of action and possible negative consequences of utilizing papaya for these objectives [11]. Papaya is known to contain natural compounds that have anti-tumor properties. Papaya extract actually has the ability to destroy tumors, and its constituents lycopene, tocopherol, and flavonoids have been demonstrated to propagate oncolytic effects and stop the evolution of tumor cells [12]. Papaya may be helpful in cancer treatment since it has been shown to directly inhibit cancer cells [13]. It is feasible to treat dengue fever with papaya leaf juice. A study examined how well papaya leaf extracts protected a 45-year-old patient from the Flavivirus (DFV). For five days in a row, a 25 mL aliquot of the hydrophillic extract was given two times daily. Leukocytes, neutrophilic granulucytes, and coagulation cells all markedly elevated,according to the study. Assessment of blood specimens showed that papaya leaf aqua-based extract has a vigorous DENV-nutralizing activity [14]

Industrial and Nutritional Application

A meat-tenderizing agent is papain. Myofibrillar and connective tissue proteins, which are responsible for tenderness, are modified by protease

enzymes; papain is a recurring component in meat processing and brewery manufacturers [15]. Because papain has antifungal, antibacterial, and anti-inflammatory properties, the pharmaceutical industry makes it as gel doses [16]. Papain protease speeds up the healing of minor wounds compared to placebos. Papaya-derived protease may also be useful in biochemical excavation dentin techniques, according to reports [17]. Papain had no adverse effects and dramatically reduced the symptoms of acute allergic sinusitis, including headache and toothache pain [18].

Conclusion

The ornamental fruit known as the Carica papaya is rich in nutrients and offers numerous health benefits. Its vitamins, minerals, and enzymes—especially cysteine protease—help with gastrointestinal metabolism, stimulate immune response, and protect against inflammatory condition and cellular oxidative stress. According to research, it can be used to treat diseases like dengue, cancer, and gut-disorders. In addition to its nutritional value, papaya has remarkable industrial utilization in food products and pharmaceuticals. Flourishing and ingesting papayas regularly can ameliorate public health in addition to gratifying the thriving demand for natural, functional, and nutraceutical foods. Papaya is essential to human well-being and long-term health enhancement.

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