

Dragon Fruit: A Review on Nutritional Profile, Functional Properties and Health Benefits

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Abstract

A dragon fruit is the tropical fruit is renowned for its vivid red color and flesh that is delicious and studded with seeds. The perennial, epiphytic, tropical climbing cactus known as dragon fruit is a member of the genus *Hylocereus* and family Cactaceae. It has triangular, fleshy, jointed stems. Although pitayas are indigenous to tropical regions of North, Central, and South America, their commercial value has led to their cultivation worldwide. The dragon fruit is regarded as a heavenly fruit with significant nutritional and therapeutic benefits. It is a significant source of phytochemicals with associated antioxidant action, such as polyphenols, flavonoids, and vitamin C. Because of their high phenolic and betacyanin content, dragon fruits are thought to have a high degree of antioxidant activity. Compared to fruits with white flesh, those with pink flesh have higher levels of flavonoids and phenolics.

Introduction

A tropical fruit with bright red skin and tasty juice sprinkled with seeds, the dragon fruit is often referred to as a strawberry pear or pitaya. The *Hylocereus* species, which are members of the Cactaceae family, are the source of a large range of dragon fruits with appealing and intriguing functional qualities. Because of its nutritional and therapeutic qualities, dragon fruits have become more and more well-known in recent years. Dragon fruit is one of the superfoods of the tropics because of its high nutritional value. Dragon fruit is a superfood that is low in calories and high in probiotics, beneficial fatty acids, antioxidants, phytonutrients, vitamins, and minerals [3].

The pitaya is a native of tropical regions of North, Central, and South America. Due to its commercial appeal and lack of demanding cultivation requirements—such as high drought tolerance, ease of adaptation to high temperatures and light intensity, broad tolerance to a variety of soil salinities, and health benefits—it is now grown throughout the world. Around 20 tropical and subtropical nations, including the Bahamas, Bermuda, Indonesia, Colombia, Israel, the Philippines, Myanmar, Malaysia, Mexico, Nicaragua, northern Australia, Okinawa

(Japan), Sri Lanka, southern China, southern Florida, Taiwan, Thailand, Vietnam, Bangladesh, and the West Indies, cultivate it for commercial purposes [9].

Maharashtra, Gujarat, Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, Haryana, Punjab, and Madhya Pradesh are among the states where it is cultivated. It's one of the exotic fruit crops that India has just lately started growing. It may be cultivated for agricultural and decorative purposes [9].

The dragon fruit has big bracteoles and is oblong to oval in shape, measuring 6–12 cm long and 4–9 cm thick. Its color is generally red. Its inside is a sweet-flavored white or crimson pulp with a thin, leathery peel. There are tiny, delicious black seeds buried in the pulp. Pitahaya, also known as dragon fruit, is a crop that may be produced both for food and decoration [2].

Additionally, it is a flavoring ingredient for smoothies, sorbets, alcoholic beverages, drinks, and pastries [2]. Dragon fruit has exquisite flavors and essences and may be used to produce a wide range of processed goods, such as cordial smoothies, jam, jelly, juice, nectar, squash, and RTS (ready to serve) beverages. The final products of dragon fruit are improved by the physicochemical characteristics of food. Soft drinks can also be made from its rich pulp. It promotes the production of probiotics, which facilitate better digestion. As a substitute for conventional caffeine-containing beverages like tea, coffee, or other soft drinks, consumers are expecting nature comparable values added food goods. This has led to an increase in the consumption of fruit juices and other natural products [9].

In Asian nations where traditional healers employ herbal remedies to both prevent and treat illnesses, dragon fruit is also regarded as a medicinal plant. Both the pulp and the peels are high in water content, high in fiber, and packed with nutrients, including a significant number of antioxidants, vitamins, and minerals. The biological activity of dragon fruit has been investigated and supported by several investigations in recent years [6].

Botanical Classification

Hylocereus is a genus that contains eighteen species. Many names for the plant exist, including

Belle of the Night, Cinderella plant, dragon fruit, pitaya, pitahaya, night-blooming cereus, and strawberry pear [5]. Dragon fruit belongs to the Cactaceae family. Most species in this genus are climbing vine cacti with aerial roots that yield stunning glabrous berries with enormous scales. Chromosome number $2n = 22$ is present in diploid *Hylocereus* species [6].

There are around 250 domesticated fruit-bearing and industrial variants in the dragon fruit genus, many of which are bred for their decorative features. Some species, however, are valuable commercially [4].

Table 1. Botanical Classification of dragon fruit

| Botanical Description | Crop description |
|-----------------------|----------------------------------|
| Common name | Dragon fruit |
| Kingdom | Plantae (plants) |
| Sub kingdom | Tracheobionta (vascular plants) |
| Chromosome number | 22 ($2n = 2X$) |
| Super division | Spermatophyta (seed plants) |
| Division | Magnoliophyta (flowering plants) |
| Class | Magnoliopsida (Dicotyledonae) |
| Order | Caryophyllales |
| Family | Cactaceae |
| Genus | <i>Hylocereus</i> |
| Species | <i>Polyrhizus</i> |
| Botanical name | <i>Hylocereus polyrhizus</i> |

Source: Britton and Rose (1963); ISB (2002); NPDC (2000)

Nutritional and Functional Profile

The genus *Hylocereus* has a number of species, although only a small number—*Hylocereus undatus*, *Hylocereus polyrhizus*, and *Hylocereus*—are farmed due to their commercial and nutritional importance [7]. The nutritional qualities of dragon fruit juice derived from various species and crops exhibit significant variation, as demonstrated by the analysis conducted.

Pitaya is a significant source of phytochemicals with antioxidant properties, including polyphenols, flavonoids, and vitamin C. Particularly the red and white pitaya, which are valued for their economic worth as well as their health advantages, have recently attracted increasing interest from throughout the globe. Because of its excellent nutritional and therapeutic qualities, dragon fruit is regarded as a heavenly fruit on Earth [7].

The high concentration of phenolics and betacyanins in dragon fruits, they are thought to have a high degree of antioxidant activity. Compared to fruits with white flesh, those with pink flesh have higher levels of flavonoids and phenolics. Dragon fruit has a high vitamin C content as well as a range of antioxidants, including hydroxycinnamates and betalains. Through the stimulation of white blood cell defense against pathogen invasion, vitamin C enhances the immune system. Along with having considerable levels of potassium, phosphorus, salt, and magnesium—amounts greater than those found in mangosteens, mangoes, and pineapples—it also has a high quantity of water-soluble fiber [3].

The following nutrients are listed for every 100 grams of red-skinned and white-fleshed dragon fruit (*Hylocereus undatus*): water (87 g), protein (1.1 g), fat (0.4 g), and carbohydrates (11.0 g). 3g of fiber, 0.04 mg of vitamin B1 (thiamine), 0.05 mg of vitamin B2 (riboflavin), 0.16 mg of vitamin B3 (niacin), 20.5 mg of vitamin C, 8.5 mg of calcium, 1.9 mg of iron, and 22.5 mg of phosphorus [7].

The fruit is eaten by many people. the usage of dragon fruit to cure diseases including high blood pressure, obesity, diabetes, high cholesterol, and prediabetes, among others. An iron-rich fruit called red dragon fruit can increase hemoglobin and erythrocyte counts, which suggests that it may be able to treat anemia. Utilizing dragon fruit might be a strategy to reduce the incidence of sickness since it is rich in phytochemicals that are beneficial to your health. The nutrients that are most crucial include betacyanin, proteins, polyphenols, iron, lipids, carbs, glucose, phytoalbumin, carotene, cobalamin, and vitamins B1, B2, B3, and C.

Conclusion

The growing trends in dragon fruit consumption these days can be attributed to their excellent nutritious content. The species, the growing location, and the harvesting period all affect value. Peel from dragon fruit has a great deal of promise for use as a natural color. The health advantages of dragon fruit are manifold, mostly in terms of oxidative stress management and control. Dragon fruit has several nutritional advantages, including high fiber content, minerals like calcium, iron, and phosphorus, low carbohydrate and fat content, and seeds rich in linoleic and linolenic acid, two necessary fatty acids.

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