# Dragon Fruit-Night Blooming Cactus

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## Introduction

The dragon fruit, a newly introduced super fruit in India, is regarded as a promising and remunerative fruit crop. Fruit has a highly appealing colour and mellow mouth melting pulp with black coloured edible seed embedded in the pulp, as well as excellent nutritional properties, which attracts farmers from all over India to plant this fruit crop that originated in Mexico and Central and South America (Britton and Rose, 1963; Morton, 1987 and Mizrahi *et al*., 1997). It is a long-day plant with a lovely night-blooming blossom and hence also known as "Noble Woman" or "Queen of the Night." Strawberry Pear, Kamalam, Pithaya, Night Blooming Cereus, Belle of the Night, Cinderella Plant, and Jesus in the Cradle are some of the other names for the fruit. It's a plant that only grows at night (nocturnal plant). Because of the bracts or scales on the fruit skin, the fruit is called pitaya, which literally means "scaly fruit." It has ornamental value because of the big (25 cm) flowers that bloom at night and are creamy white in colour. There are 3 different species of dragon fruit: *Hylocereus undatus*—white flesh with pink skin, *Hylocereus polyrhizus*– red flesh with pink skin and *Hylocereus (Selenicerus) megalanthus* – white flesh with yellow skin.

**Taxonomical Classification**

| Kingdom | Plantae |
|---|---|
| Order | Caryophyllales |
| Family | Cactaceae |
| Sub family | Cactoideae |
| Tribe | Hylocereae |
| Genus | Hylocereus |
| Species | *H. undatus* |

## Origin and Distribution

The majority of *Hylocereus species* are found in Mexico, Central America and South America (*Mizrahi et al*., 1997). *Hylocereus spp*. are now found all over the world (in tropical and subtropical areas), however in India, *H. undatus* is the most widely distributed species, followed by *H. costaricensis*. Because of its hardiness, this fruit crop can withstand the harsh weather conditions of India's desert and semi-arid regions.

## Nutritional Importance

Vitamin B1, vitamin B2, vitamin B3 and vitamin C, as well as protein, fat, carbohydrate, crude fibre, flavonoid, thiamin, niacin, pyridoxine, cobalamin, glucose, phenolic, betacyanins, polyphenol, carotene, phosphorus, iron and phytoalbumin are all abundant in *Hylocereus undatus*. It's rich in phytoalbumins, which are known for their antioxidant effects (Mahattanatawee *et al*., 2006).

## Pharmacological Activities

- Antioxidant activity.
- Anticancer activity.
- Antimicrobial activity.
- Prebiotic effect.
- Cardio- protective effect.
- Hypocholesterolemic Effect.

## Botanical Description

**Fruit -** The fruit is a fleshy berry that is oblong in shape and about 4.5 inches (11 cm) thick, with a red or yellow skin/peel with scales and spines. Depending on the species, pulp might be pink, white, red or magenta in colour.

**Flowers -**Although the flowers are hermaphroditic, some pitaya species and cultivars are incompatible with one another. The big, fragrant, nocturnal, bell-shaped white blossoms are incredibly spectacular, tasty and can be inches long (36 cm) and 9 inches wide (23 cm). Cream stamens and stigmas with lobed stigmas. On the stem margin, 3 to 5 spherical buttons appear, with two to three of them developing into flower buds in around 13 days. After 16-17 days, when anthesis begins, the light green, cylindrical flower buds reach a height of around 11 inches (Pushpakumara *et al.*, 2006).

***Hylocereus undatus*, white-fleshed**

***Hylocereus polyrhizus*, red-fleshed**

***Hylocereus megalanthus***

***Hylocereus undatus* with both carpels and Stamens**

***Hylocereus undatus* flowers on plant**

## Propagation

Seeds and vegetative cuttings can be used to propagate these plants. Seed propagation is not recommended due to seedling variability, and it takes 4-5 years for seedlings to blossom and fruit. Plants produced by vegetative techniques yield blooms in three years, hence commercial cultivars are propagated by vegetative means.

## Irrigation Requirements

Even if dragon fruit can survive with very low rainfall, when good quality fruits are required, a consistent water supply is essential. Irrigation is vital because it allows the plant to build up enough reserves not just to flower at the best moment, but also to ensure that the fruits grow properly. Micro-irrigation on a local level is advised. Micro-irrigation, in addition to the effectiveness of the water supplied by this system, eliminates uneven and excessive watering, which can cause blooms and early fruits to fall off.

## Plant Protection Measures

On *Hylocereus*, just a few pests have been identified. Ants belonging to the genera Atta and Solenopsis are well-known pests that can seriously harm plants, flowers, and fruits. *Cotinus mutabilis* perforates the stem and *Leptoglossus zonatus* sucks the sap, producing stains and some deformation. Aphids and scales of various species have also been seen on fruits and flowers. Rats and birds can wreak havoc on flowers and fruits, as well as ripe fruits. In reality, bees are incredibly efficient, and they can collect all of the pollen in just a few hours of activity. Pollen must be collected prior to the arrival of the bees and manual pollination must be performed the next morning after the bees have departed the plantation. Various fungal (*Gloeosporium agaves, Macssonina agaves, Dothiorella sp., and Botryosphaeria dothidea*), viral (Cactus virus X) and bacterial (*Xanthomonas sp. and Erwinia sp.*) infections have been reported which also infects the fruits (Barbeau, 1990).

## Harvesting

The fruit skin changes colour late in the maturation period, from green to red or rosy-pink (25 or 27 days) after anthesis (depending on the species) (Nerd *et al*., 1999). Harvesting H. costaricensis will take 30 days (Anon, 2017). The fruits achieve their maximum coloration four or five days later, which causes splitting and economic loss (Anon, 2017). The first harvest occurs 14 months (*H. costaricensis*) after the cuttings were planted under West Bengal conditions; the duration between flowering and harvest is brief and varies only little depending on the environment, ranging from (27 to 33) days. The yield is roughly (10 to 30) t/ha and is dependent on planting density (Anon, 2017). Picking is difficult because to the lack of a peduncle. The current harvesting approach of just twisting and moving the fruit in a clockwise direction causes less or no damage to the fruits (Anon, 2017). Although the fruits are not very delicate, some precautions should be taken to assure a high-quality product, such as careful handling during processing and storage, especially for *H. costaricensis*, which has brittle foliated scales.

## Conclusion

Dragon fruit look to have various selling factors commercially; they are appealing in shape and colour and have excellent nutraceutical properties, which attract producers from all across India. The red flesh species, *H. costaricensis*, is also high in betalains, which caters to the growing demand for antioxidant products and natural food colourants. *H. undatus* is a prospective alternative medicine source that may act as an antioxidant, anticancer, hypocholesterolemic, cardioprotective, antibacterial and prebiotic agent. Apart from that, numerous studies on this fruit have shown that it has a wide range of pharmacological actions. The crop is hardy and may thrive in any climate that is conducive to flowering and fruiting, as well as in soil with adequate drainage. This fruit crop needs research in different aspects.

## References


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