

# Dragon Fruit (*Hylocereus* species): Anti-Inflammatory, Antioxidant, Anti-Lipidemic, Anti-Cancer Properties

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The Dragon fruit plant (*Hylocereus spp.*) is an evergreen cactus with thin, leafless vine-like branches that grows quickly and can reach heights of 1.5 to 2.5 meters. It is an epiphytic or terrestrial cactus with succulent three-winged stalks.

**Table 1. Nutrient content of Dragon fruit per 100 g**

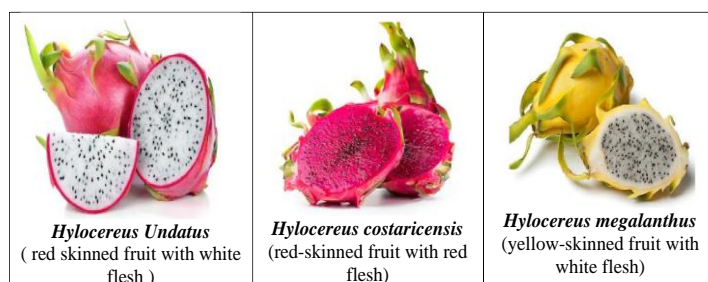
Name	Amount
Water	84 g
Energy	57 kcal
Protein	0.36 g
Total lipid (fat)	0.14 g
Carbohydrate, by difference	15.2 g
Fiber, total dietary	3.1 g
Sugars, total including NLEA	9.75 g
Calcium, Ca	9 mg
Iron, Fe	0.18 mg
Magnesium, Mg	7 mg
Phosphorus, P	12 mg
Potassium, K	116 mg
Sodium, Na	1 mg
Zinc, Zn	0.1 mg
Copper, Cu	0.082 mg
Vitamin C, total ascorbic acid	4.3 mg

(Source: USDA Food Data Central, 2022)

The stem has several branching segments and is mushy and vinelike. Three wavy wings, one to three spines, or occasionally no spines, are present on each segment. The plant's aerial roots grow on the underside of the stems, absorb water, and hold the stems firmly in place. Often white in colour, dragon fruits have a bell shape and are 25 to 30 cm long and 15 to 17 cm wide. The fruit is stunning, with bright red skin covered in green scales, and either red or white flesh that is filled with numerous tiny black seeds.

## Antioxidant Effects

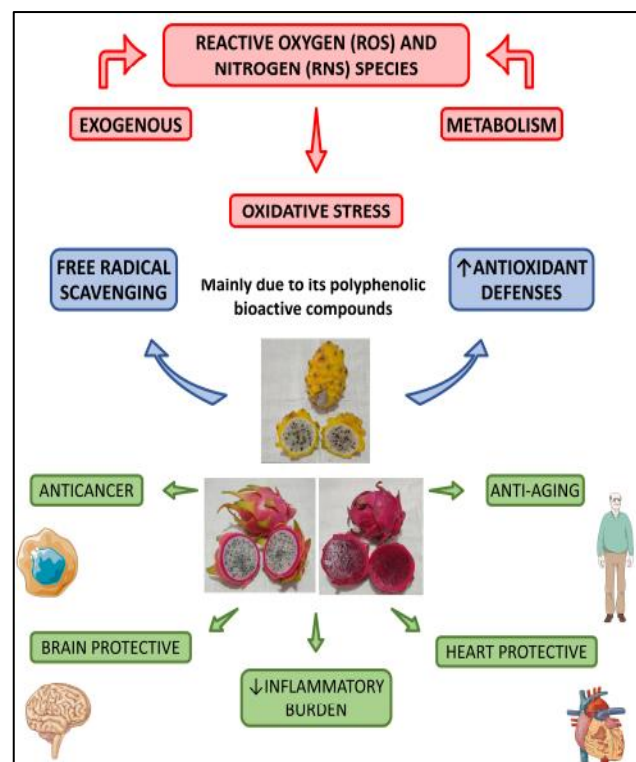
By Species *Hylocereus. polyrhizus* is rich in betalains and other bioactive compounds such as vitamins and phenolic compounds that exert relevant



**Figure 1. Types of Dragons Fruit**

(Source: Nishikito et al., 2023)

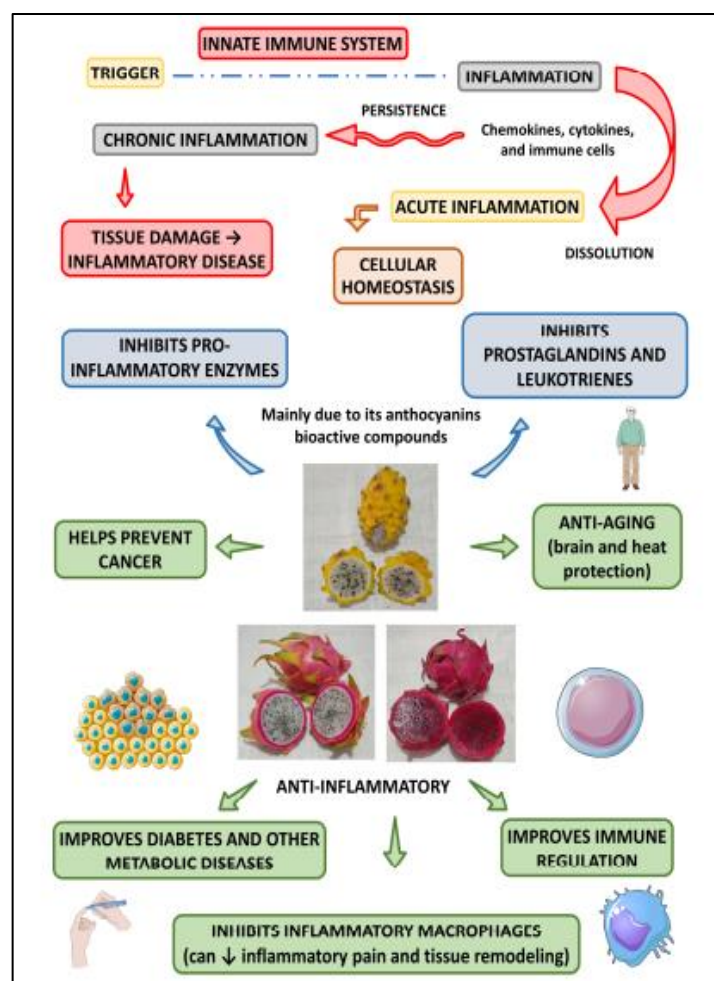
antioxidant properties and, for these reasons, are related to the prevention of several human diseases. The oil results from the seeds, and the peel is also an essential source of antioxidant compounds. The peel of *H. undatus* possesses more flavonoids than the flesh. The antioxidant properties of dragon fruit extract were investigated. Total antioxidant status was reduced in pre-diabetic and normocholesterolemic subjects that consumed red pitaya.



**Figure 2. Main antioxidant effects of *Hylocereus* species and their health effects. ↑ – increase; ↓ – decrease (Source: Nishikito et al., 2023)**

## Anti-Inflammatory Effects

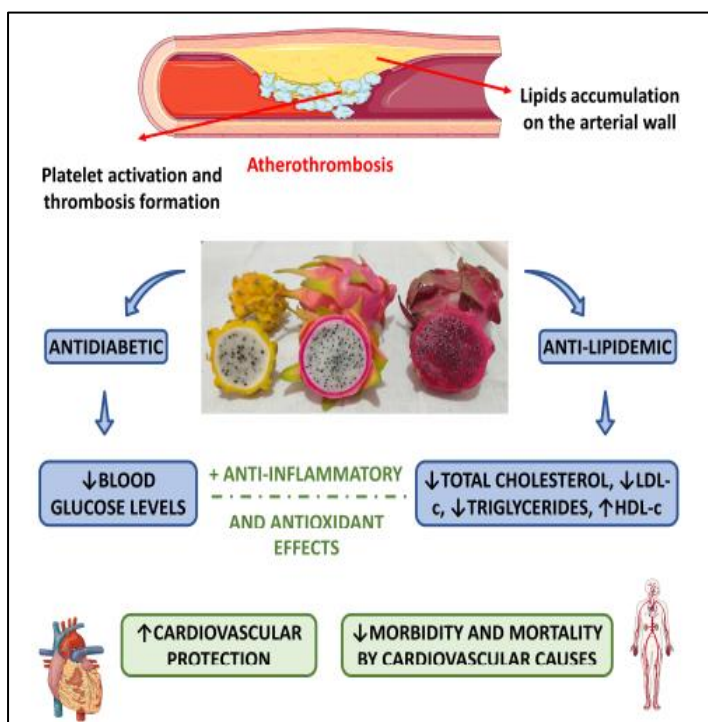
Besides the antioxidant actions, dragon fruit can also exert anti-inflammatory actions. anthocyanins (cyanidin 3-glucoside, delphinidin 3-glucoside, and pelargonidin 3-glucoside) in the pulp and peel of pitaya red. the first anthocyanin (cyanidin 3-glucoside) inhibited the synthesis of reactive oxygen and nitrogen species, cyclooxygenase-2 (COX-2), and inducible nitric oxide synthase (iNOS), in in vitro models and without resulting in cytotoxicity. the dragon flesh and peel extract and the isolated squalene led to the inhibition of pro-inflammatory enzymes such as cyclooxygenase-2 lipoxygenase and acetylcholinesterase and concluded that this fruit could produce a significant potential for the control and management of inflammatory processes through different pathways that may include, prostaglandin, leukotriene, and cholinergic pathways.



**Figure 3. Main anti-inflammatory effects of *Hylocereus* species and their health effects. ↑ – increase; ↓ – decrease (Source: Nishikito et al., 2023).**

## Anti-Lipidemic Effects

The use of red pitaya can improve lipid profile, decrease total cholesterol, LDL-c, and triglycerides, and increase HDL-c levels in normocholesterolemic subjects, pre-diabetic, and type 2 diabetic patients. The consumption of red pitaya also showed benefits in lipid levels in dyslipidemic C57BL/6 mice, contributing to reducing cardiovascular diseases. the effects of the consumption of red pitaya skin extract on the lipid profile of male Wistar rats with diabetes and dyslipidemia and did not find a significant reduction in the lipid profile of these animals.



**Figure 4. Cardiovascular protective effects of the *Hylocereus* species. ↑ – increase; ↓ – decrease; HDL-c – high-density lipoprotein cholesterol; LDL-c – low-density lipoprotein cholesterol (Source: Nishikito et al., 2023).**

## Anti-Cancer Effects

Some studies have shown the anti-cancer potential of dragon fruit. the ability of this fruit to produce nanoparticles and found they can significantly inhibit the growth of MCF-7 breast cancer cells. Another study showed that the fecal fermentation of pitaya oligosaccharides augmented the populations of *Lactobacillus* and decreased the populations of *Bacteroides* and *Clostridium*, and resulted in the production of lactic acid, acetic acid, propionic and butyric acids that can inhibit Caco-2

cells and has a potential for risk reduction in colon cancer. the anti-proliferative effect of red pitaya on B16F10 melanoma cells. They showed that the peel has stronger inhibition of the growth of these cancer cells than the flesh.

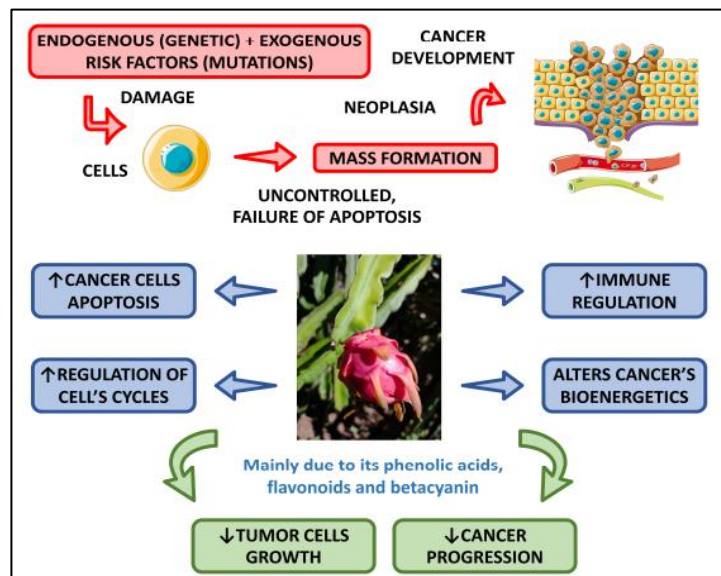


Figure 5. Main anti-cancer effects of *Hylocereus* species. ↑ – increase; ↓ – decrease (Source: Nishikito et al., 2023).

## Conclusion

Studies show that Dragon fruit has beneficial potential for human health, having antioxidant, anti-inflammatory, antilipemic, anti-diabetic, antibacterial, anti-fungal, and anti-cancer effects. The consumption of this fruit can act on oxidative stress and anti-inflammatory processes and control or reduce the occurrence of conditions such as diabetes, dyslipidemia, metabolic syndrome, cardiovascular diseases, and cancer.

## Reference

Nishikito, Daniela & Borges, Ana & Fornari Laurindo, Lucas & Otoboni, Alda & Direito, Rosa & Goulart, Ricardo & Nicolau, Claudia & Fiorini, Adriana & Sinatora, Renata & Barbalho, Sandra. (2023). Anti-Inflammatory, Antioxidant, and Other Health Effects of Dragon Fruit and Potential Delivery Systems for Its Bioactive Compounds. *Pharmaceutics*. 15. 159. 10.3390/pharmaceutics15010159.

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