



Therapeutic value of Dragon Fruits: an overview

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ABSTRACT

Dragon fruits are defined as medicinal fruit from the ancient times by Maya civilization. The flower and fruits of dragon fruits are very much effective to prevent health issues including this fruit is functioned as hypoglycemic, wound sanitizers and also it is diuretic fruit. In addition to that, flowers and seeds of dragon fruit are utilised as beverages for healing gastritis, act as a laxative and upgraded the symptoms of kidney disorders. Furthermore, in case of dysentery it is functional as the healing fruit, apart from that, it is a healing fruit. Dragon fruits species like *Hylocereus polyrhizus*, *Hylocene undatus*, and red pitaya provide enormous health benefits like anti-inflammatory, antioxidant, and antimicrobial activity. Besides that, skin of this species is effective in hexane, chloroform and ethanol extract promote good impact upon the development of gram positive and gram-negative microbes at minimum hindering concentration of 50L like *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* on human health. In accordance with Hübner, 2019 pulp and ginger amalgamation in secondary fermentation mechanism develop beers have great antioxidant status and carries supreme organoleptic attributes in comparison with normal marketed beer.

KEYWORDS

Dragon fruits, health benefits, fruit pulp, kidney disorders, antioxidant, functional foods.

Introduction

Consuming enough fruits can lower the prevalence of common illnesses such as diabetes, heart disease, stroke, obesity, constipation, and high blood pressure (Tewari *et al.*, 2021). Among fruits, dragon fruits are very much important for human health. Dragon fruit, also known as pitaya or pitahaya, is a tropical fruit that belongs to the cactus family. There are several varieties of dragon fruit, with the two most common types being the white-fleshed and red-fleshed varieties. The fruit is not only visually appealing but also offers various health benefits, contributing to its potential therapeutic value. Here are some aspects of the therapeutic value of dragon fruit (Attar *et al.*, 2022). Omega-3 and omega-6 fatty acids, which can help prevent cardiovascular disorders, are also included in it along with protein. Its dietary value, therapeutic potential, and other health advantages are increasing its appeal for both cultivation and consumption on a global scale. Furthermore, because of its physiology and broad tolerance, dragon fruit has the amazing capacity to grow in a wide range of agro-climates, including hot and dry places. Because the state offers more favourable climatic and edaphic conditions for dragon fruit growing and because it is paving the path for a very promising business, dragon fruit may thus be guaranteed as a profitable fruit crop for Chhattisgarh growers (Patel *et al.*, 2023).

Health benefits of dragon fruits

Dragon fruits are defined as medicinal fruit from the ancient times by Maya civilization. The flower and fruits of dragon are very much effective to prevent health issues including this fruit is functioned as hypoglycaemic, wound sanitizers and also it is diuretic fruit. Furthermore, in case of dysentery it is functioned as the healing fruit, apart from that, flowers and seeds are utilised as beverages for healing gastritis, act as a laxative and upgraded the symptoms of kidney disorders. Among dragon flower and fruits, fruits enrich by extensive bioactive constituents than flowers (Hernández & Salazar, 2012; Jeronimo

et al., 2017; Kumar *et al.*, 2018; Safira *et al.*, 2021).

Antioxidant activity of every species of dragon fruits are very much pronounced. Pitaya has extensive vitamins and phenolic constituents and natural colourant Betalain that promote antioxidant attributes which mitigate couple of disorders. The oil of seeds and peels are the prime origin of antioxidants, moreover peels carry flavonoid rather than flesh of pitaya (Hernández & Salazar, 2012; Kumar *et al.*, 2018; Safira *et al.*, 2021; Hitendraprasad *et al.*, 2020). Antioxidant status of red dragon fruits lesions the activity of prediabetic and normocholesterolemic issues (Abd Hadi *et al.*, 2016). Red dragon fruits lesion the parameter of malondialdehyde in diabetes, therefore stop the oxidative stress (Putri *et al.*, 2021). Apart from antioxidant characteristics of dragon fruits, it also promotes better anti-inflammatory attributes in human being (Saenjum *et al.*, 2021). Anthocyanin in peels and pulp of pitaya like cyanidin, delphinidin and pelargonidin shares good anti-inflammatory impacts. Moreover, pulp containing cyanidin stop the generation of reactive oxygen species, nitrogen species, cyclooxygenase-2, inducible nitric oxide synthase (iNOS). In accordance with Amin *et al.*, 2022, dragon fruits species for instance *Hylocereus polyrhizus*, *Hylocereus undatus* provides enormous health benefits like anti-inflammatory, antioxidant, and antimicrobial activity. Experiment has shown that aqueous extract of *Hylocereus polyrhizus* is super prominent in point of antimicrobial efficacy rather than *Hylocereus undatus* in comparison with ethyl acetate and ethanolic extracts.

Authors have expressed that, the foremost carbohydrates of red and white flesh of pitaya are glucose, fructose, oligosaccharides. The combined oligosaccharides are defiant to hydrolysis through 34.88% α -amylase of people and 4.04% gastric juice of human. Apart from that, amalgamated oligosaccharides trigger the development of probiotics like *Lactobacilli* and *Bifidobacterium* (Wichienchot *et al.*, 2010).

Authors have also revealed that fermentation of oligosaccharides in pitaya escalates the concentration of *Bifidobacterium*, *Lactobacilli* alongside lesions the population of *Bacteroides* and *Clostridium*. Precisely, dragon fruits provide prebiotic activity and short chain fatty acids like acetic acid, propionic acids, butyric acids, and lactic acids are developed at considerable mass (Dasaesamoh *et al.*, 2016).

Peels of red pitaya provide supreme antimicrobial impacts against harmful bacteria like *Escherichia coli*, *Pseudomonas aeruginosa* on human health (Temak *et al.*, 2019). Seeds of *Hylocereus undatus* have efficacy against gram positive and gram-negative microbes at minimum hindering concentration of 50 μ L like *Staphylococcus aureus* and *Escherichia coli*, apart from that, skin of this species is effective in hexane, chloroform and ethanol extract promote good impact upon the development of gram positive and gram-negative microbes. Authors have also conveyed that, peels extract of red dragon fruit may provide anti-fungal activity opposed to *Rhizoctonia solani*, *Candida albicans*, *Aspergillus flavus*, *Botrytis cinerea*, *Fusarium oxysporum*, and *Cladosporium herbarum* (Tenore *et al.*, 2012).

Pitaya has efficacy to develop nanoparticles and stop the development of MCF-7 breast cancer cells (Divakaran *et al.*, 2019). Authors have also noted that, fermented oligosaccharides of dragon fruit increased the concentration of *Lactobacillus* besides lesions the development of *Bacteroides* and *Clostridium* therefore short chain fatty acids and lactic acids decrease the development of caco-2 cells so that reduces colon cancer (Dasaesamoh *et al.*, 2016). Methanolic extraction of *H. undatus* improve the cancer in liver by stopping the effectivity in HepG-2 cancer cells (Padmavathy *et al.*, 2021). Furthermore, phenolic acid, flavonoid and betacyanin have supreme anticancer impacts on human health (Khoo *et al.*, 2022; Guimarães *et al.*, 2017).

Noteworthy, red pitaya has pronounced anti-diabetic efficacy upon human health as it fallen glycemia in human (Fadlilah & Sucipto,

2020). Authors have noted that, red coloured pitaya is the substitute of metformin as it lesions HOMA-IR that means Homeostasis model assessment- insulin resistance and fallen the malonaldehyde concentration in type-2 diabetes subjects also decrease insulin resistance in case of diabetes (Holanda *et al.*, 2021). *H. polyrhizus* species decreases fasting blood sugar.

Authors have also expressed that, red dragon fruits ameliorate blood lipid level simultaneously mitigate total cholesterol, LDL-C, triglycerides level, also escalates HDL-C in pre-diabetic and type-II diabetes subjects (Abd Hadi *et al.*, 2016). The imbibing of red dragon fruits decreases cardiovascular complications (Holanda *et al.*, 2021).

Authors have also expressed that, colour, shapes, flavour, fragrance that induce the inclination for vernacular and tropical fruits (Deshmukh & Gaikwad, 2022; Ai *et al.*, 2022; Wu *et al.*, 2019). Each section of pitaya like pulp, rind, seeds, flower buds and dried flowers enriches by extreme antioxidant, fibre, vitamin-C, minerals like calcium, phosphorus (Huang *et al.*, 2021; Pérez-Orozco & Sosa, 2022). Exterior skin of dragon fruits carries betacyanin therefore colour of fruit is red. The chief constituent of betacyanin is betanin, Isobetanin, phyllocatin, isophyllocatin, hylocerenin. In the presence of many bioactive constituents, betacyanin is defined as organic colourant. Dissimilarity of anthocyanin, pH of betacyanin is 3 to 7, betacyanin carries prime antioxidant capacity and is functioned as nutraceutical (Wahdaningsih *et al.*, 2020; Pérez-Orozco & Sosa, 2022; Calva-Estrada *et al.*, 2022). Furthermore, betacyanin is the organic red-violet colouring components which have enormous biological attributes (Kumorkiewicz-Jamro *et al.*, 2021; de Lima *et al.*, 2020). Anthocyanin and betacyanin both are natural colourants, dietary fibres of dragon fruit is the alternative to restore the temporary fat in frozen desserts like ice cream, kulfi. Furthermore, peels of *H. polyrhizus* is defined as fat exchanger to develop high fibre and low-calorie ice cream and other desserts (Filho *et al.*, 2022).

As pitaya is ecofriendly therefore, it is utilised in active packaging and edible film development to prolong the storage life of food constituents along with modifying the constituent of betacyanin and another phenolic substitutes (Liu *et al.*, 2019; Qin *et al.*, 2020). Moreover, betacyanin is also applied in edible food packaging. Authors have revealed that, microencapsulated *Hylocereus undatus* pulp extracted is utilised in food supplements to decrease the impact of copper poisoning and lesions metal including oxidative stress (Tamagno *et al.*, 2022). In accordance with Hübner, 2019 pulp of pitaya and ginger amalgamation in secondary fermentation mechanism develop beers have great antioxidant status and carries supreme organoleptic attributes in comparison with normal marketed beer.

Conclusion

Dragon fruits are defined as medicinal fruit from the ancient times by Maya civilization. The flower and fruits of dragon fruits are very much effective to prevent health issues including this fruit is functioned as hypoglycaemic, wound sanitizers and also it is diuretic fruit. In addition to that, flowers and seeds of dragon fruit are utilised as beverages for healing gastritis, act as a laxative and upgraded the symptoms of kidney disorders. Pitaya has extensive vitamins and phenolic constituents and natural colourant Betalain that promote antioxidant attributes which mitigate couple of disorders.

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