DATE: October 8, 2023
TO: Professor Thacker
FROM: Elizabeth Oh
SUBJECT: **Technical and General Summaries of Academic Study about Biochemical Makeup of Dragon fruit**

For this assignment, I have synthesized the information in the academic study "Biochemical and nutritional characterization of dragon fruit (*Hylocereus* species)" into two documents: a technical summary and a general summary. The technical summary is intended for readers familiar with dietary science and the general summary is intended for a general audience of consumers.

Subject and Purpose of Summaries

These summaries will better educate the public and disperse information about dragon fruit, a fruit that is becoming increasingly cultivated and consumed in the United States. The findings of this study distinguish the nutritional makeup of red and white-pulped dragon fruit, highlighting the benefits and deficits of each. The researchers posit that their data presents an opportunity to improve the diets of consumers.

Reason for Summaries

The findings of this study may be used by dieticians and people seeking to supplement their diets with healthy, organic food. Because the makeups of red and white-pulped dragon fruit had not received comprehensive analyses before this study, this article is important in providing scientific data about various commercially cultivated dragon fruit species.

Report
on
"Biochemical and Nutritional Characterization of Dragon Fruit (*Hylocereus* species)" by Arivalagan et al. 2021

submitted to
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October 8, 2023

by Elizabeth Oh

This report summarizes the results of the academic study "Biochemical and Nutritional Characterization of Dragon Fruit (*Hylocereus* species)" by Arivalagan et al. (2021) and explains the significance of the findings. Particularly, the difference between commercially cultivated red and white-pulped dragon fruit species is discussed with emphasis on the nutritional benefits of each.

Keywords:

Dragon fruit, food chemistry, diet, nutrition, sugar content, minerals, antioxidant potential, phenolic acids, free radicals

Arivalagan, M. et al. (2021). Biochemical and nutritional characterization of dragon fruit (*Hylocereus* species), *Food Chemistry*, 353, 1-11 ISSN 0308-8146, https://doi.org/10.1016/j.foodchem.2021.129426

Technical Summary

Article Purpose
This article describes the biochemical and nutritional makeup of commercially available dragon fruit species. It also applies the data to human diets and claims that the consumption of red and white-pulped dragon fruit can be beneficial to various vulnerable populations.

Rationale for the Topic
This article presents the most comprehensive data currently available on dragon fruit, a food consumed around the world. Because the data reveals the ability of dragon fruit to combat chronic illnesses, these findings may influence dietary trends in humans.

Major Points Discussed
- Five species of red and white-pulped dragon fruit species belonging to the *Hylocereus* genus were cultivated from stem cuttings in an orchard at the ICAR-Indian Institute of Horticultural Research in Hirehalli, Karnataka, India. Subjects were selected randomly in the third year of growth and analyzed in a laboratory setting.
- A series of laboratory tests were employed to identify the nutritional components of the dragon fruit species. These tests included:
    - 2,6-dichlorophenol-indophenol (DCPIP) method to determine vitamin C content.
    - Phenol-sulphuric acid method to determine sugar content.
    - Use of an Agilent atomic absorption spectrometer to determine mineral content.
    - DPPH radical scavenging activity by Brand-Williams et al. (1995) to determine total antioxidant potential.
- Red-pulped dragon fruit have higher relative antioxidant potential because they contain a higher number of phenolic acids. These acids prevent diseases by scavenging free radicals during the metabolic process.
- White-pulped dragon fruit have higher relative harvest yield and sugar content. Despite this, the caloric value and sugar total of all dragon fruit are lower than most commercially available fruit.
- Both have vitamin C, which protects cells from oxidative damage and lowers risk of chronic diseases like heart disease, cancer, and macular degeneration. Dragon fruit also contain the minerals potassium, magnesium, calcium, iron, and copper.

Conclusion
Dragon fruit of the *Hylocereus* genus are valuable dietary sources for people seeking bodily improvement and healthy lifestyles because of the dense yield of important nutrients and minerals in both red and white-pulped species. Notably, dragon fruit contain phenolic acids and have relatively low sugar and caloric values when compared to other commercial fruits. It can reliably be titled a superfood because of the conclusive data gathered during this study.

Arivalagan, M. et al. (2021). Biochemical and nutritional characterization of dragon fruit (*Hylocereus* species), *Food Chemistry*, 353, 1-11 ISSN 0308-8146, https://doi.org/10.1016/j.foodchem.2021.129426

General Summary

Article Purpose
This article describes the biochemical and nutritional makeup of commercially available dragon fruit species with emphasis on their benefits on human diets, including the reduced risk of chronic disease.

Rationale for the Topic
According to the article, no other study has investigated the specific makeup of dragon fruit species. This article reports the most thorough data about dragon fruit in existence, a food that is regularly consumed across the world.

Major Points Discussed
- Five species of red and white-pulped dragon fruit species were cultivated from stem cuttings in an orchard in Hirehalli, Karnataka, India. Subjects were selected randomly in the third year of growth and analyzed in a laboratory setting.
- A series of laboratory tests were employed to identify the nutritional components of the dragon fruit species. These tests included analyses for nutrients and minerals which work on the microscopic level to improve bodily functions once consumed.
- Red-pulped dragon fruit have higher relative antioxidant potential because they contain a higher number of phenolic acids. These acids prevent diseases by scavenging free radicals, toxic byproducts created during the metabolic process.
- White-pulped dragon fruit plants yield more fruit and have higher relative sugar content. Despite this, the caloric value and sugar total of all dragon fruit are lower than most commercially available fruit.
- Both dragon fruit types have vitamin C, which protects cells from oxidative damage and lowers risk of chronic diseases like heart disease, cancer, and macular degeneration. Humans cannot generate vitamin C organically and must get it from food, so this makes dragon fruit an important dietary source.

Conclusion
Dragon fruit are valuable dietary sources for people seeking bodily improvement and healthy lifestyles because of the dense yield of important nutrients and minerals in both red and white-pulped species. Notably, dragon fruit provide chemicals that eliminate toxins in the body while remaining a low sugar, low calorie food. It is a beneficial fruit that can be adopted into many people's diets to promote health and fitness.