



Indian Farmer
Volume 9, Issue 05, 2022, Pp. 155-160.
Available online at: www.indianfarmer.net
ISSN: 2394-1227 (Online)

ORIGINAL PAPER



Health benefits and uses of exotic Star fruit

Daman Preet Kour and Neeraj Gupta

*Division of Food Science and Technology,
SK University of Agricultural Sciences and technology of Jammu, Chatha J&K-180009*

**Corresponding author: damanreen323@gmail.com*

Article Received: 28 April 2022

Published Date: 03 May 2022

Fruits and vegetables are good food sources of antioxidants for the prevention of degenerative diseases in our diet (Shui and Leong, 2006). Star Carambola fruit (*Averrhoa carambola* L.) is an attractive fruit also known as “Golden Star” that belongs to the family *Oxalidaceae* (Kesavnath *et al.* 2015). Starfruit is a star shaped tropical fruit has a sweet and sour taste. The length of the starfruit is about 2 to 6 inches. There are two main classes of Carambola, the Smaller ones with a sour taste and the larger with sweet flavour. It is assumed to have originated in Ceylon and Moluccas but however it's been cultivated in South East Asia for many years. Carambola should be classed as tropical and subtropical environments because mature trees can withstand freezing temperatures for shorter periods and almost unbearable damage at 27° F (-2.78° C). Best performance needed for the growth of Star Fruit (Carambola) can be achieved by ideal rainfall and having good moisture availability. In India, it is commonly found in warmer parts, mainly in the southern region. It stretches from Kerala to West Bengal along the state and west coast. Star fruit has many medicinal uses and additionally contains secondary metabolites that have diverse organic activities (Hitesh and Tejpal, 2016). Ripen Star Fruit can be eaten fresh or as dessert and can be further processed into fermented or unfermented drinks, jams and jellies and though the unripen one may also be consumed as a vegetable (Patil *et al.* 2010).



Star fruit tree



Star fruit

Nutritional Composition of Star Fruit:

Proanthocyanidins, Catechin, and Vitamin C are good sources of natural antioxidants found in Star Fruit. Starfruit contains active compounds such as amino acids, oxalic acid, tartaric acid, citric acid, carbohydrates, fats, and proteins. The amount of oxalic acid content in (Carambola) Star Fruit is very good (probably upto 1 wt% of wet mass or 74% total acid depending on the fruit ripening (Siregar,2017). Impressive list of essential nutrients, antioxidants, and vitamins required for well being of health are present in Star Fruit. Its waxy peel provides with a good amount of dietary fibre. Also,

fibre helps to prevent the absorption of LDL-cholesterol from foods in the intestines. 100 g of fresh fruit contains 34.7 mg of vitamin-C or 57% of daily requirement. Star fruit is rich in polyphenolic flavonoids which are antioxidants phytonutrients. Quercetin, epicatechin, and gallic acid are few of the flavonoids found in Star Fruit. This fruit has a total polyphenol content (Folin assay) of 143mg/100g. Furthermore, Star Fruit is high in B-complex vitamins such as folates, riboflavin, and pyridoxine (vitamin B-6). Altogether, these vitamins act as co-factors for enzymes involved in metabolism as well as in various synthetic functions within the body. Star fruit also contains trace amounts of minerals and electrolytes such as potassium, phosphorus, and zinc and iron. Potassium, as an important component of cell and body fluids aids in the regulation of heart rate and blood pressure and thus, counter acts the negative effects of sodium. Vitamin and mineral content of Star fruit is presented in Table 1. (Nirali *et al.* 2017).

Table 1. Vitamin & Mineral Composition of Star Fruit (*Averrhoa carambola*)

Vitamins	Value (mg/g)
Folates	12 µg
Niacin	0.367 mg
Pyridoxine	0.017 mg
Ribofalvin	0.016 mg
Thiamin	0.014 mg
Vitamin A	61 IU
Vitamin C	34.4 mg
Vitamin E	0.15 mg
Vitamin K	0 µg
Minerals	Value (mg/g)
Calcium	3 mg
Iron	0.08 mg
Magnesium	10 mg
Phosphorus	12 mg
Zinc	0.12 mg

Health benefits of Star fruit

The Star fruit (*Averrhoa carambola*), a popular fruit in many parts of the world, is thought to have numerous nutritional and medicinal effects. Each Star Fruit contains a high concentration of fibre, which adds to the favourable effects on glucose homeostasis. Insoluble fibres limit α -amylase activity and delay the release of glucose from starch which resulted in antidiabetic effect (Lakmal *et al.* 2021). The various other potential health properties of Star Fruits are as following-

-Antioxidant property: According to studies conducted, it was reported that Starfruit contain proanthocyanins which act as antioxidant in addition to Vitamin C and Gallic acid. The primary function of antioxidants is to scavenge reactive oxygen species (ROS) such as peroxides. Fatty acids are typically sensitive to oxidative damage by peroxides and hyperperoxides. Starfruit also aids in the removal of toxins from the body helps the immune system in protecting against cancer, ROS damage and lipoperoxidation.

-Antiinflammatory and antimicrobial property: It was indicated in studies that, Starfruit extracts help in lowering the skin inflammatory condition and acts as anti-inflammatory by consuming it. In addition, it also inhibited the growth of *Staphylococcus aureus* and *Klebsiella spp* and was found to have anti-microbial effect.

-Antiulcer property: Starfruits are used traditionally to treat stomach discomfort or any ulcer-like conditions. Anti-ulcerogenic effects of leaves of Star Fruit plant leaves have been demonstrated. Terpenoids (diterpenes and triterpenes), flavonoids and mucilage, are found in the extracts and known to have antiulcer activities. The mucilage acts as a lining to the gastro-intestinal mucosa, aiding in the prevention of gastritis related damages.

-A source of water insoluble fibres: The cellulose content of Star Fruit is roughly 60%, the hemicellulose content is and Pectin content is 13% and thus indicating that Star Fruit is rich in insoluble fibres fractions (IFF). Because insoluble fibres can retain more water than cellulose, they are referred to as 'water insoluble fibre fractions' or WIFF. WIFFs t has the capability of reducing blood glucose by decreasing carbohydrate absorption in our body and also aids in the slow movements of bowels. Furthermore, the fibre helps to reduce overall cholesterol levels in the body by creating a hypoglycaemic impact. Fruit-juice consumption with the fibres (together referred as smoothie) aids in the removal of lipids through the excretion, reducing the risks of cardiovascular diseases. Star Fruit (*Carambola*) extracts have been reported with selective anti-brain-tumour activity (Muthu *et al.* 2016).

Traditional uses of Star fruit

For thousands of years Star fruit (*Averrhoa carambola*) has been used to treat diabetes and diabetic nephropathy (DN), arthralgia, vomiting, lithangiuria, coughing and, as well as chronic paroxysmal headache. Various medicinal organs of *Carambola* including leaves, roots, flowers, and the fruits have been utilized as ethnomedicine for a long time in Chinese, Indian, Malaysian, and Brazilian medicine. For example, in traditional Malaysia medicine the crushed shoots or leaves of *A. carambola* are commonly applied to treat headache, chicken-pox, and ringworm, while a decoction of the leaves and fruits of *A. carambola* is generally used for treating vomiting, fevers, aphthous stomatitis, and angina. Due to the excellent hypoglycemic effects of Star fruit in Sri Lanka, it is used traditionally to treat and prevent diabetes mellitus. The fruit, juice, as well as tea derived from leaves of *A. carambola* have long been used to prevent and cure diabetes, high blood pressure, and urinary system problems in traditional Brazilian medicine.

Star fruit is also thought to be a dietary supplement that helps persons with a low appetite. According to Indian traditional medicine, the ripe fruits of Star Fruit can be used effectively for treating the haemorrhage bleeding, fever, eczema as well as diarrhoea. In Ayurveda the ripe fruit of *A. carambola* is usually considered as digestive and tonic. Overall, the leaves, roots, flowers, and fruits of this plant, might be effectively used as nutritious supplement and should be further researched and developed as a functional food or medicinal agent in the management of human health (Luan *et al.* 2021).

CONCLUSION

Nowadays, low-immunity and high oxidative stress are common problems in elderly people which are linked to chronic illnesses such as; hypertension, stroke, cardiac diseases, diabetics, and cancer, so in order to cure these diseases seasonal fruit such as Star fruit claims to improve the health status with its antioxidant and anti-inflammatory effects in human body. The significant amount of dietary fibre which aids in the inhibition of dietary LDL cholesterol absorption in the stomach is obtained from tropical Star fruit along with its peel. As, a result this fruit provides us with many natural therapeutic properties having numerous benefits on human health.

REFERENCES

- Hitesh, K and Tejpal, A. 2016. Starfruit: A fruit for healthy life. *Journal of Pharmacognosy and Phytochemistry*, 5(3), 132.
- Kesavanath, J., Premakumar, K., and Inthujaa, Y. 2015. Nutritional and sensory characteristics of star fruit and sweet orange juices blend fruit Cordial. *International Journal of Multidisciplinary Studies*, 2(2).
- Lakmal, K., Yasawardene, P., Jayarajah, U., and Seneviratne, S. L. 2021. Nutritional and medicinal properties of Star fruit (*Averrhoa carambola*). *Food Science and Nutrition*, 9(3): 1810-1823.
- Luan, F., Peng, L., Lei, Z., Jia, X., Zou, J., Yang, Y., He, X., and Zeng, N. 2021. Traditional Uses, Phytochemical Constituents and Pharmacological Properties of *Averrhoa carambola* L. *Frontiers in Pharmacology*, 1814.
- Muthu, N., Lee, S. Y., Phua, K. K., and Bhore, S. J. 2016. Nutritional, medicinal and toxicological attributes of star-fruits (*Averrhoa carambola* L.). *Bioinformation*, 12(12): 420-424.
- Nirali, C. S., Patil, D. S., and Ahire, K. H. 2017. Formulation, Sensory, Chemical and Nutritional Attributes of Star fruit, Muskmelon and Orange Squash with Basil Seed. *International Journal of Science and Research*, 6(9): 1135-1142.
- Patil, A. G., Patil, D. A., Phatak, A. V., and Chandra, N. 2010. Physical and chemical characteristics of carambola (*Averrhoa carambola* L.) fruit at three stages of maturity. *International Journal of Applied Biology and Pharmaceutical Technology*, 1(2): 624-629.

Siregar-Anggi, M. S. 2017. Lactic acid fermentation in star fruit (*Averrhoa carambola*) juice by *Lactobacillus Plantarum*. *International Journal of Biochemistry, Bioinformatics and Biotechnology Studies*, 1-5.

Shui, G and Leong, L. P. 2006. Residue from star fruit as valuable source for functional food ingredients and antioxidant nutraceuticals. *Food chemistry*, **97**(2): 277-284.