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Health Benefits of Brinjal (Eggplant)

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INTRODUCTION

Eggplant (*Solanum melongena* Linn.) is warm season plant and commonly known as brinjal or aubergine. Eggplant belongs to the solanaceae family and frequently cultivated in the tropical and sub-tropical region of the world. India is considered as origin place of the eggplant and was introduced to Europe by the Arabs and transported to Africa by the Persians. India is the second largest producer of the eggplant after china and followed by Egypt and Turkey. In India, it is cultivated as important vegetable crops.

Eggplant is branching bushy plants with thick and woody stem. Leaves of eggplants are green to grayish in colour, large size and covered with spiny fuzz. There are many sizes and shapes of fruit, with skin colors ranging from blackish purple to florescent purplish green to gold or white. In addition, some varieties produce lovely bicolor or striped skin. The fruit has a dense, uniform and firm, white, sweet flesh. It is generally grown twice or thrice in the year and fruit is available throughout the year. The cultivation of eggplant is like other solanaceous vegetable crops.

Thick pericarp, least amount of the fibers and freshness during the storage throughout the period without developing brown colour are considered as good characteristics of the brinjal fruit. The whole fruit of the brinjal is edible but form of the bulk of fruit and contains most of the nutritive ingredients while fibers are not desirable. Eggplant has great importance in the solanaceous vegetable crops because of the presence of high nutritive and medicinal values.

Nutritional Contents of Eggplant

The fruit of eggplant has very high nutritive and medicinal value. Eggplants are nutrient-dense food because of the presence of sufficient amount of the minerals, vitamins and fiber.

An eggplant fruit contains variety of nutrients viz. calories, carbohydrates, fiber, proteins, amino acids, manganese, folate, fat, potassium and vitamins. The present carbohydrates in the fruits are glucose, fructose, sucrose and rhamnose. The bitterness of brinjal fruit is due to the presence of solasodine, solanidine alkaloids and some other plant secondary metabolites. Brinjal seeds also contain the good amount of the oil percentage. The oil found in the brinjal seed is high in antioxidants. The dry seed of the brinjal contain 21.2 per cent oil. Some other phenolic compounds like anthocyanins, including nasunin, lutein, and zeaxanthin are found in the eggplant and acts as antioxidants.

In general, a 100 gm fruit of eggplant contains 92 gm water, 4.7 gm carbohydrates, 1.4 gm protein, 1.3 gm fiber and 0.3 gm fat. Eggplants are richest source of minerals. According to an estimate, a 100 gm fruit of eggplant having the 200.0 gm potassium, 52.0 mg chlorine, 0.8 mg iron, 2.4 mg manganese, 16.0 mg magnesium, 17.0 mg copper, 44.0 mg sulphur, 47.0 mg phosphorus and 30.0 mg sodium. Nicotinic acid and iodine are also found in the well developed fruit of eggplant. The developed fruit of eggplant contains nicotinic acid 0.9 mg/100gm and 0.7 mg iodine per 100 mg of the fruit weight.

The dry weight of the eggplant fruit contains 14 to 18 % of proteins. Almost essential amino acids are found in the brinjal fruit and increase the nutritive value. The essential acid composition of the per gm of fruit dry weight contain tryptophan 0.06 mg, metheonine 0.06 mg, lysine 0.10 mg, histidine 0.11 mg, arginine 0.21 mg, threonine 0.23 mg, phenylalanine 0.27 mg, isoleucine 0.32 mg, valine 0.37 mg and leucine 0.39 mg. Brinjal fruit is the richest source of vitamin C and Vitamin A. Its fruit and leaves contain vitamin C and α-tocopherol. According to an estimate, a 100 gm eggplant fruit contain 12.0 mg ascorbic acid, 0.11 mg riboflavin, 0.04 mg thiamine, vitamin C 12.0 to 24.4 mg and 124 I.U. of the vitamin A.

Health Benefits

Brinjal fruit has high nutritive value and medicinal property. In addition, its leaves and seeds have also been found to be useful in veneral disease like syphilis. The leave extract of the eggplant is used in the cure of several types of skin diseases, otitis, anorexia piles, inflammation, intestinal foot pain and intestine difficulties. Raw fruits help in improving appetite and enriching the blood. It has also been found cardio-tonic. Ripe fruits are used as laxative and leaf extract is an important constituent of liver medicine.

Eggplant is the richest source of anthocyanin and their derivatives. The anthocyanin present in the eggplant fruit has significant role against neuronal problems, cardiovascular disorders and diabetes. The fiber contents of the eggplant play crucial role in digestion removing harmful materials from the stomach. The other phytonutrient of the eggplant boost the memory function of the brain and maintain the brain health by protecting its cell membrane. They have also the ability to protect brain from the brain tumour.

Eggplants are also the richest source of mineral nutrients like Mn, Mg, K, Cu and Fe. These mineral nutrients are important for the healthy bones. Eggplant fruit is suggested to the pregnant women's and lactating mothers because of the presence of good quality of the iron (Fe) source. The iron present in the eggplant has the ability to pact with amenorrhea, antenatal anemia and pre-menstrual syndrome. Moreover, the fruit of the eggplant is useful in the various disorders like diabetes, bronchitis, dysentery, high blood pressure and asthma. In addition, the well matured fruit of the eggplant is very useful against stomach troubles, compress for swellings and splintered nipples.

Eggplant is the also found as good source of the antioxidant. Some of the general use and health benefits of and eggplants and their bioactive compounds are as follows:-

- **Chlorogenic Acid:** In human body, chlorogenic acid acts as anti-obesity, anti –

carcinogenic, and anti-diabetic. Chlorogenic acid also shows anticarcinogenic functions by making apoptosis in many human cancer cells. They also have the properties of Antioxidant, anti-inflammatory, cardio protective.

- **Delphinidin:** Helpful to reduce vascular inflammation. Significantly reduce the blood glucose and oxidative stresses.
- **Hydroxycinnamic Acids:** Hydroxycinnamic acids found in eggplant protect from side effects of chemotherapy. Hydroxycinnamic acid is antioxidant in nature and produces free radicals for removing unwanted waste materials of the body.
- **Isorhamnetin:** Potentially useful in the treatment of human hepato-cellular cancer cells. They are also prevents the endothelial cell injuries caused by oxidized low-density of the lipoprotein.
- **Kaempferol:** Kaempferol secondary metabolites of the eggplant fruit and having the property defence of against free radicals, reduces the risk of chronic diseases, especially cancer.
- **Lutein:** Lutein present in the eggplant is non-provitamin-A carotenoids acting as antioxidant in retina and protects the eyes from oxidative stresses and inflammation.
- **Luteolin:** Luteolin found in the eggplant has several biological and pharmaceutical properties. They are antioxidant, anti-inflammatory in nature and useful in the treatment of useful in treating atherosclerosis.
- **Myricetin:** Myricetin is one of the wonderful secondary metabolites of eggplant fruits acts as anti-carcinogenic, antiviral, antimicrobial and anti-platelet activity. They are also helpful in protection of cell and cytoprotective in nature.
- **Quercetin:** Quercetin found in the brinjal fruits has the property of antioxidant. They are useful in for the improvement of normal cell survival in the body. They have property of antiviral, antibacterial and muscles relaxation.
- **Tannins:** Eggplant fruit is the good source of tannins and inhibit adipogenesis by enhancing glucose uptake.
- **Zeaxanthin:** Zeaxanthin present in the eggplant is pro-oxidant in nature and having the property of strong antioxidant. They are beneficial for the anti-inflammatory effect on the retinal tissues of the eyes.
- **B–Cryptoxanthin:** B–Cryptoxanthin is found in the eggplant as plant secondary metabolites. B –Cryptoxanthin is the potent precursor of the vitamin – A. They help to prevent the damage of biomolecules by free radicals. B – Cryptoxanthin is also helpful in the treatment of certain cancer in ayurveda.

CONCLUSION

Eggplant is economically important crop of the solanaceae family because of the significant role in the several pharmaceutical and medicinal areas. The health maintenance compounds present in the eggplant antioxidants and phenolic compounds have great opportunity to explore the future research activities. Rather than secondary metabolites present in the eggplant, some additional primary metabolites or primary plant products like amino acids and carbohydrates may also the indicator of good health. The other bioactive compounds, vitamins, nutrient minerals etc. would must be recognize eggplant to carried out the nutritive and pharmaceutical property in the future research and also in the biochemical estimation for future crop improvement.