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The powerful health boosting seeds – Basil seeds: A review

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ABSTRACT

Sweet Basil Seeds are called to be one of the super foods because it has remarkable qualities in terms of its medicinal uses. It has been used since earliest times to prevent many diseases. When basil seeds are soaked in water, it forms a layer of mucilage around the seed. This mucilage layer is a rich source of hydrocolloid which imparts functional properties to the seeds. This makes them suitable to use as a source of fiber. Also, can act as various agents in food items like emulsifying, foaming, thickening, gelling, binding and stabilizing agent, and as a part of composite flour for gluten free food products as it is gluten free as well. The present review article focuses on nutritional composition, functional properties and health benefits.

KEY WORDS: Pharmaceutical, hydrocolloid, gelling, mucilage, nutritional

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1. INTRODUCTION

Sweet basil seeds are commonly known as sabja or takhmaria seeds which belong to family Lamiaceace[1]. Sweet basil seeds are native to India particularly indigenous to lower hills of Punjab. It was introduced to Greece by Alexander the Great in 350 BC and it reached to England through India in 1600s[2]. This seeds are been utilized in Ayurvedic and Unani system of medicines and also accepted as ornamental crop[3]. It is a medicinal, decorative, ritual and seasonal herb[4]. In several parts of Asia, traditional beverages such as (sharbat) and ice desserts like falooda are prepared using basil seeds[5].

2. DISCRIPTION

Sweet basil is a herbaceous, aromatic and autogamous plant that is annual and perennial of plant size upto 20 to 50 cm tall. They blossom in late summer and leaves are broadly oval with the pea, green with purple color extensions. The seeds color is totally black; teardrop shaped and looks alike to poppy seeds[6]. The odour of the seeds is Neutral[7].

3. VERNACULAR NAMES

Table 3.1: Common International names of basil seeds

English	Sweet basil seeds
French	Basilic Cultive
German	Basilien Krau
Pakistani	Tukh malanga
Indonesian	Selasih

Table 3.2: Common Indian names of basil seeds

Hindi	Sabja seeds, Sabza seeds
Tamil	Thiruneetru Patchai Vithai, Sabja Vithai
Telugu	Sabja Ginjalu
Punjabi	Baburi
Kannada	Kama Kasturi
Malayalam	Tirunitru
Kashmiri	Hazbo
Marathi	Tulasa Biyane
Bengali	Tulasi Bija

4. TAXONOMICAL CLASSIFICATION

Table 4.1: Scientific classification of basil seeds

Kingdom	*Plantae*
Order	*Lamiales*
Family	*Lamiaceae*
Genus	*Ocimum*
Species	*O. basilicum*

5. NUTRITIONAL VALUES[9]

Hajmohammadi *et al*, 2016 prepared fruit based beverage which used swollen basil seeds for fortification of that beverage. He determined the chemical composition of basil seeds.

Table 5.1: Proximate composition of basil seeds (g/100g)

Macronutrients	
Energy	975 kJ/223 Kcal
Protein	23 g
Carbohydrates	48 g
Fat	4 g

Table 5.2: Vitamin composition of basil seeds (mg/100g)

Vitamins	
Vitmain A	744 IU
Vitamin E	10.7 mg
Vitmain K	1714.5 mcg
Vitmain B1	0.08 mg
Vitamin B2	1.2 mg
Vitamin B3	4.9 mg
Vitmain B5	0838 mg
Vitmain B6	1.34 mg
Vitmain B9	310 mcg

They contain 42% of carbohydrate, 20% proteins and almost 25% fats. It is high in fiber content. 4gms of sweet basil seeds contains more fiber than an entire bulb of lettuce. It is low in calories and has alpha linolenic acid (ALA). It is highly beneficial since it has omega-3 fatty acids. According to

Agunbiade *et al*, (2015), Basil seeds and leaves are good source of minerals. They are high in Calcium, Iron, magnesium, potassium, folic acid and vitamin E makes it useful for a range of important functions in the body.

Not only these, they are very rich in antioxidants as well. They are rich in antioxidants like Orientin and Vicenin. These compounds were tested in-vitro laboratory against radiation-induced lipid per-oxidation mouse liver to know the possible anti-oxidant properties. High levels of lutein, zeaxanthin, vitamin A and vitamin K are present too. These antioxidants help act as protective scavengers against oxygen-derived free radicals and reactive oxygen species (ROS). These radicals and ROS play role in various disease process and in ageing. Zeaxanthin is a vital antioxidant which has its importance in eye. It is yellow flavonoid carotenoid compound which filter harmful UV rays from reaching the retina by selectively absorbed by retinal macula lutea. Studies suggest that sweet basil seeds in elderly helps in protection from age-related macular diseases (AMRD). Moreover, essential oils like eugenol, citronellol, linalool, limonene, citral and terpinol are also found in abundance. The oils provide anti inflammatory and anti bacterial benefits. The range of essential oil content is from 0.07 to 1.92% among the basil accessions[11]. The findings by (Nakamura *et al*, 2009) suggest that sweet basil fragrances that can soothe stress.

Table 5.3: Mineral composition of basil seeds

Minerals	
Betaine	16.1
Calcium	2240 mg
Iron	89.8 mg
Magnesium	711 mg
Phosphorus	274 mg
Potassium	2630 mg
Sodium	76 mg
Zinc	7.1 mg
Copper	2.1 mg
Manganese	9.8 mg
Selenium	3 mcg

Ocimum basilicum seeds are hydrophilic in nature. They contain a reasonable amount of hemicelluloses and cellulose. The outer pericarp swells into a gelatinous mass due to presence of a polysaccharide layer when they are soaked in water[13]. Basil seeds are usually used as thickening and stabilizing agent because

of their high polysaccharide contents and/or and in many studies, they are generally processed into essential oil products[14]. The phenolic content of basil seeds has various health promoting functions as antioxidant capacity of phenolic compounds protect the cell from free radicals which cause damage in the body if not treated properly[15].

6. HEALTH BENEFITS

Basil seeds also known as "king of herbs" because of its nutritional content which results in number of health benefits[16].

- ***Weight loss, hair and healthy skin***

  The good fiber content in it helps in satisfying the satiety value making a person feel less hungry. Adequate amount of protein and Iron makes the hair shiny and used with coconut oil, helps in preventing many skin related diseases. High fat diet, constituting of 31% fat, was given on daily basis to groups of rats. An oral dose of 800 mg/kg of extracts of O. suave or O. basilicum was given for period of 21 days. As compared with normal feed fed rats, in the HFD control rats, 7% fat (significant $p < 0.05$) increases in serum levels of total cholesterol (HDL and LDL) and the serum triacylglycerols significantly ($p < 0.05$) reduced[17].

- ***Diuretic properties***

  Sweet basil seeds have swelling capacity. Thus it promotes dieresis that is increased production of urine[18].

- ***Coolant***

  These seeds are used in lowering body heat. It is important ingredient used in Falooda in Asian countries. This helps in quenching the thirst and treating stomach burn.

- ***Treatment of arthritis***

  Due to anti inflammatory properties, it is used in providing relief from swollen and painful joints. Eugenol, an essential oil in basil seeds found to be anti-inflammatory. It acts against enzyme *cycloxygenase* (COX). Inside the human body, COX enzyme mediates inflammatory reactions.

- ***Hypoglycemic activity***

  The basil seeds had alpha-glucosidase and alpha-amylase inhibiting activities, which is valuable in controling diabetes[19].

- ***Antihyperlipidemic***

The results of the study revealed that basil strongly protect cardioprotective effects. The reason for it could be could be antioxidative activities against isoproterenol- induced infraction[20]. It helps to reduce the plaque formation of the arteries.

- ***Anti microbial***

The antibacterial activity of the essential oils was examined against multi resistant E.coli strain ATCC 25922 as well as 60 other clinical strains of E.coli, the tst showed that basil seeds have greater ability to inhibit bacterial growth[21]. Various compounds like ursolic acid showed the strongest activity against DNA virus, herpes viruses-1 and RNA viruses[22].

- ***Anti cancer activity***

Researchers have found that having basil seeds shrinks the cancer cell and display the signs of detachment from the surface of the walls denoting cell death[23].

- ***Promote milk production in nursing women***

The plant is traditionally used to increase production of breast milk in lactating mothers.

- ***Anti- colitis***

The ameliorative effect of *Ocimum basilicum* essential oil on an acetic acid-induced colitis model showed that after the treatment with the essential oil, increased level of myeloperoxidase was significantly decreased (200 and 400 μL/kg). The results showed that *Ocimum basilicum* have protective and preventive effect against acetic acid induced colitis[24].

- ***Dermatologic Effects***

Munir et al, (2017) studied in humans, the effects of extracts of various plant parts of basil (*Ocimum basilicum L.*) against acne vulgaris. They concluded that these extracts were quite effective in combating against acne vulgaris[26].

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