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Salvia hispanica L. seeds: A rare medicinal herb and potential pharmaceutical additive

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Abstract: Salvia hispanica is a plant widespread to Central America. Chia is the common name for it. The seeds obtained from the current plant are most usually used. As public health awareness grows around the world, so does the need for functional foods with many health advantages. Salvia hispanica is a plant widespread to Central America. Chia is the common name for it. The seeds obtained from the current plant are most usually used. As public health awareness grows around the world, so does the need for functional foods with many health advantages. They are also known as "health food" due to their strong nutritional and therapeutic properties. When the seeds are soaked in a suitable solvent, such as water, they exude a sticky gel-like substance that can be employed as an excipient in both culinary and pharmaceutical compositions. This paper will go over all of the therapeutic benefits of the present plant and its parts, as well as the plant's use as an ingredient in foods and pharmaceuticals.

Keywords: *Salvia hispanica;* Chia; Medicinal uses; Additive; Pharmaceutical

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1. Introduction

Chia is the common name for several Salvia species, the most notable of which being *Salvia columbari-ae*, *Salvia hispanica*, and *Salvia polystachya*. Carolus Linnaeus (1707-1778) discovered *S. hispanica* growing wild in the new world and mistook it for a native plant from Spain.Chia, on the other hand, is native to Mexico and was introduced to Spain after Hernán Cortés resided there. Chia (*S. hispanica* L.) is a seed with unique significance in Latin America, owing to the fact that it has been consumed by Mesoamerican people since ancient times, and the term chia is credited to these people.This has been thoroughly chronicled by historians, Spaniard colonisers, and by local themselves[1]. Chia (*Salvia hispanica* L.) is a tiny seed produced by the annual herbaceous plant *Salvia hispanica* L. Because of its great nutritional and therapeutic values, Chia seeds have gained in popularity in recent years.Chia was grown by Mesopotamian tribes before disappearing for decades until it was rediscovered in the mid-twentieth century. Chia seeds are high in omega-3 fatty acids, polyunsaturated fatty acids, fibre, protein, vitamins, and minerals. Aside from that, the seeds are high in polyphenols and antioxidants such as caffeicacid, rosmarinic acid, myricetin, quercetin, and others. Chia has now been studied in a variety of disciplines. Chia seed advantages have been studied in the medical, pharmaceutical, and food industries all around the world.Chia oil is becoming one of the market's most valued oils. The oil has been produced using several extraction processes[2]. Salvia hispanica L. was given the common name chia by the indigenous South American peoples of the pre-Columbian and Aztec civilizations because of its medical properties. It has been highly recommended as an alternative crop for the field crop business due to its ability to flourish in arid environments[3].

Figure 2. Chemical Constituents of Chia seed.

Chia seed contains 22-24 g/100 g protein, 26-41 g/100 g carbs, 18-30 g/100 g dietary fibre, 4-6 g/100 g ash, vitamins, antioxidants, minerals, 91-93 g/100 g dry matter, and 32-39 g/100 g oil content[4].

Lipids: According to the literature, the primary FA in chia seed oil from various growing regions are ALA (up to 65%), linoleic (up to 20%), palmitic (about 7%), oleic (around 5-7%), and stearic (about 3-4%) acids. Seed oils are high in α-linolenic acid (ALA), an important fatty acid and precursor to docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA).Chia (*Salvia hispanica* L.) seeds are the most ALA-rich plant source available today[5]. Chia oil is rich in polyunsaturated fatty acids and can contain up to 68% omega-3 alpha-linolenic acid, which may provide health benefits to cardio-vascular patients[6].

Proteins: Chia (Salvia hispanica L.) is a plant that produces seeds that are high in protein and contain some nutraceutical components. However, little is known about them[7]. Chia seeds are high in plant protein, which contributes for 18-24% of their weight. Analyses of the amino acid composition revealed the presence of ten exogenous amino acids, with arginine, leucine, phenylalanine, valine, and lysine having the highest levels. Chia seed proteins are also high in endogenous amino acids, primarily glutamic and aspartic acids, as well as alanine, serine, and glycine[8]. An examination of the AA makeup in chia seed revealed a total of 10 AA, including all nine essential AA (leucine, isoleucine, lysine, phenylalanine, methionine, tryptophan, threonine, histidine, and valine), and this quality makes it a complete protein source for human nutrition, where arginine, phenylalanine, leucine, valine, and lysine are exogeneous, while glutamic, alanine, aspartic acids, serine, and glycine are endogenous AA. As a result, these seeds have been termed the "super new golden seed" and "the seed of the twenty-first century"[9].

Fibers: Chia seeds are high in fibre, with around 11 grammes of fibre per 100 g of seed. The fibres in chia seeds are mostly soluble fibres, which are good for digestion, avoiding constipation, and controlling blood sugar levels. Soluble fibres generate a gel-like material in the gut, slowing digestion and keeping you feeling full for extended periods of time. Furthermore, the fibre found in chia seeds may assist to manage cholesterol levels and lower the risk of heart disease[6].

Carbohydrates: Chia seeds are high in carbohydrates. One ounce (28 gram) of chia seeds provides around 12 grams of carbohydrates, 11 g of which are fibre and only 1 g of which is sugar. As a result, chia seeds are a low-sugar, high-fiber carbohydrate source.

Chia seeds contain soluble fibres known as hydrocolloids, notably polysaccharides such as galactomannans and arabinogalactans, which are responsible for the characteristic "mucilage" or gel-like texture when soaked in liquid. When these fibres come into

touch with liquid, they produce a gel-like material, making chia seeds an excellent thickener in food and beverages. Chia seeds' gel-forming ability makes them a valuable source of dietary fibre, which promotes good digestion and may help regulate blood sugar levels[10].

3. Therapeutic uses of Chia seed:

Chia seeds have several potential therapeutic uses, including:

Heart health: Chia seeds contain alpha-linolenic acid, an Omega-3 fatty acid that can help improve heart health[11].

Blood sugar control: The fiber and protein in Chia seeds can slow down digestion and help regulate blood sugar levels[12].

Weight management: Chia seeds are low in calories and high in fiber, making them a good choice for people looking to manage their weight[13].

Digestive health: Chia seeds are high in fiber, which can help promote digestive health and relieve constipation[14].

Bone health: Chia seeds contain calcium, phosphorus, and magnesium, all of which are important for maintaining healthy bones[15].

Antioxidant properties: Chia seeds are a good source of antioxidants, which can help protect the body from damage caused by free radicals[16].

4. Potential pharmaceutical uses of Chia seed

Because of their gel-forming capabilities, chia seeds can be employed as a pharmaceutical excipient in the manufacture of oral solid dosage forms such as tablets and capsules. Chia seeds can absorb up to 12 times their weight in water, generating a hydrophilic gel that can be employed in tablet formulations as a binder or disintegrant. Furthermore, chia seeds are high in fibre, protein, and essential fatty acids, making them a healthy and natural addition to oral dose forms.

When hydrated: mucilage creates a gel-like substance that can be used as a binder or disintegrant in tablet formulations, thereby improving the final product's stability and performance17.

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