

A review on Cumin seeds (*Cuminum cyminum* L.): Widely Known for Traditional and Medicinal Purposes with Healthy Benefits

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Abstract: Spices act as bio-nutrient enhancers, elevating the taste, aroma, and flavor of food while providing therapeutic advantages for numerous health conditions. Cumin (*Cuminum cyminum* L.), an annual herb, is one of the most ancient and widely cultivated aromatic plants. Its seeds are highly esteemed for their medicinal, nutraceutical, and pharmaceutical properties.¹⁶ Cumin is extensively utilized across diverse industries, including food, beverages, medicine, liquor, perfumery, and toiletries Rich in antioxidants and essential nutrients like iron, cumin seeds offer numerous health benefits, such as improved digestion, enhanced immune function, and better blood sugar management. They are a common ingredient in spice blends, curries, soups, stews, and roasted meat seasonings. Cumin has demonstrated significant potential in preventing and treating various diseases, including cancer, aging-related issues, metabolic disorders, neurological conditions, cardiovascular diseases, and inflammatory ailments These health benefits are attributed to its bioactive compounds, including phenylpropanoids, terpenes, flavonoids, and anthocyanins. This work highlights the nutritional and therapeutic value of cumin seeds and their contribution to overall health.¹

Key words: *Cuminum cyminum* L, cumin, antioxidant

INTRODUCTION

Cumin is the second most popular seed after black pepper and is one of the oldest aromatic plants with a wide range of medicinal, nutraceutical, and pharmaceutical uses. It is an annual plant, extensively grown in arid and semi-arid regions like China, Egypt, Saudi Arabia, the Mediterranean, India, and Iran. India is the largest consumer, while China leads in production and export. Cumin is known for its antioxidant properties and is traditionally used as a remedy for ailments such as diarrhoea, indigestion, epilepsy, and jaundice, among others. It is also utilized in the food, beverage, perfume, and

pharmaceutical industries.⁵ The oleoresin extracted from cumin seeds is widely used in foods like crackers, sauces, meats, and sausages. Its characteristic strong aroma, which is primarily due to cuminol (making up 2.5–4.0% of the seed), The essential oils in cumin seeds are mainly composed of hydrocarbon's and aldehydes.

The term "cumin" is derived from the Latin *Cuminum*, which traces back to the Greek "kyminon." In India, it is widely known as jeera or zeera and is botanically classified as *Cuminum cyminum* from the Apiaceae family. Cumin is native to the region spanning from the Eastern Mediterranean to South Asia. According to Ayurveda, cumin seeds possess significant medicinal properties, particularly for treating digestive issues. In ancient Ayurvedic practices,⁽²²⁾



cumin was used to address gastrointestinal problems, diarrhoea, and jaundice. It has also been employed to manage conditions such as hypertension, epilepsy, fever, pediatric illnesses, gynaecological, and respiratory issues.²² India's traditional medicine system extensively relied on cumin for various treatments, and the country now produces 70% of the global cumin supply for both culinary and medicinal purposes.

Cumin grows to a height of 30–60 cm, featuring a smooth, branched, and slender stem. Its leaves are compound, with thread-like leaflets. The plant produces terminal umbel inflorescences, with each branch bearing 3–9 umbels, each containing 5–7 umbellets made up of small hermaphroditic flowers, either white or pink⁸. Cumin produces schizocarps fruits, which split into two mericarps, and the seeds are oblong, about 6 mm long, and thicker in the center. It is typically sown in winter or autumn, with seedlings emerging after 14 to 50 days. Germination usually occurs at temperatures below 20°C.³

Cumin seeds are known to enhance the immune and digestive systems, prevent allergies, and combat nasal congestion. They also exhibit antioxidant, anti-diabetic, memory-boosting, and brain-enhancing properties, along with potential anti-cancer benefits. Additionally, cumin aids in reducing acne and hair loss, and it serves as an aromatic spice that supports wound clotting. It is commonly used to treat gastrointestinal conditions such as food poisoning, typhoid, vomiting, short bowel syndrome, and is also beneficial for cardiovascular and pulmonary disorders. Moreover, cumin acts as a cough remedy and provides pain relief.

Cumin seed essential oil has demonstrated antibacterial effects against *Klebsiella pneumoniae*, *Bacillus subtilis*, and *Escherichia coli*. However, the use of larger quantities of cumin as a food additive during fermentation for long-term food preservation requires renewed evaluation regarding its sustainability, toxicity, and microbiological safety.

Synonyms: *Cumina Cyminum* J.F.Gmel, *Cuminum odorum salisb*, *Cuminum sativum* J.SM²⁴

Taxonomical Classification

The taxonomical classification of cumin seeds, which come from the plant *Cuminum cyminum* is as follows:

Kingdom. : Plantae, Division: Thracheophyta, Class: Dicotyledonous,

Order: Apiales, Family: Apiaceae, Genus: *Cuminum*

Species: *Cuminum Cyminum*²⁴

Nomenclature /Common Name

word cumin was derived from the Latin *cuminum*, which itself was derived from Greek (*kyminon*) common names of the plant were: Arabic: Kamoun,

Kamun; Chinese: Xian , Ziran.; English: Cumin, Roman caraway; French: Cumin, Cumin de Malte, India: Jiiraa (Jeera), Zeera (zira, ziira), afed ziiraa (Safed zira), Safed jiiraa (Safaid jeera); Italian: Cumino¹¹

chemical formula for cuminaldehyde, a major component of cumin's aroma, is C₁₀H₁₂O¹

Traditional history

Traditionally, cumin has been widely utilized as a treatment for gastrointestinal issues, inflammatory conditions, neurological ailments, and toothaches.

In Iranian traditional medicine, cumin fruits are specifically used for managing colic, diarrhea, indigestion, and gas, and to help stimulate breast milk production.

In Morocco, cumin is commonly added as a flavoring to foods and soft dates, while in Tunisia, it is valued both as an aromatic herb and a culinary spice.

In Italy, it has also been traditionally used for treating various digestive and neurological disorders.

It has historically been a remedy for hoarseness, jaundice, indigestion, and diarrhea. Its seeds were valued for their stomachic, diuretic, carminative, stimulant, astringent, and abortifacient effects

Cumin oil, derived from the ripe seeds, found use in both perfumery and as a seasoning ingredient in curry powders, soups, stews, sausages, cheeses, pickles, meats, and chutneys.

In regions like America, Africa, and India, cumin has historically been used to induce menstruation and as an abortifacient. In Indonesia, it was a traditional remedy for bloody diarrhea, and a paste made from cumin was applied to the forehead to alleviate headaches. It was also consumed to ease rheumatic discomfort.¹⁹

In India, cumin was utilized to address various health conditions, including kidney and bladder stones, chronic diarrhea, leprosy, eye disorders, and as an abortive agent. Within the Unani medical tradition, cumin fruits were valued for their astringent, carminative, and emmenagogue properties. They were also used to treat corneal opacities, ulcers, boils, styes, and to relieve cough and inflammation. The medicinal components of cumin included oil extracted from its ripe seeds and the dried, ripe fruits.^{6,7}

Chemical composition of cuminseeds:

Cumin seeds are rich in various bioactive compounds, including essential oils, fatty acids, and proteins. The primary components of cumin seeds' essential oil are cumin aldehyde (also known as cuminaldehyde), which contributes to its distinctive aroma, as well as terpenes such as γ -terpinene and β -pinene. Additionally, cumin contains phenolic compounds, flavonoids, and alkaloids, all of which contribute to its antioxidant properties. The seeds also include proteins, carbohydrates, fiber, and essential minerals like iron, magnesium, and calcium. These chemical constituents play a role in cumin's medicinal and nutritional properties, such as its antimicrobial, anti-inflammatory, and digestive benefits.²³

Nutrients present in cumin seeds

Cumin seeds are a rich source of essential nutrients. They contain:

1. Vitamins

- Vitamin A
- Vitamin C
- Vitamin E
- B-vitamins, particularly B1 (thiamine), B2 (riboflavin), B3 (niacin), and B6.

2. Minerals

- Iron (prominent, supporting red blood cell production)
- Magnesium
- Calcium
- Manganese
- Zinc
- Phosphorus
- Potassium

3. Macronutrients

- Protein (about 17-18%)
- Carbohydrates
- Dietary fiber (supports digestion)
- Fats (including beneficial fatty acids)

4. Bioactive compounds

- Antioxidants like flavonoids and phenolic compounds
- Essential oils (rich in cuminaldehyde, γ -terpinene, and β -pinene)

These nutrients contribute to cumin's health benefits, including supporting digestion, boosting immunity, and providing antioxidant protection.¹⁴

Ayurvedic characteristics of Cumin seeds

RASA (Taste). KATU (Pungent)

- GUNA (Primary Qualities). LAGHU (Light), RUKSHA (Dry)

- VIRYA (potency) USHNA (Heating)

- VIPAKA (Post-digestive Effect): KATU (Pungent)

- PRABHAVA (Specific Action): Supports Digestion

- DOSHA KARMA (Impact on Doshas): Balances Kapha and Vata, enhances Pitta, and detoxifies excess Pitta (reduces SAMA PITTA condition)

- Effects on Dhatus (Tissues): Influences RASA, RAKTA, MEDAS, and SHUKRA

- Effects on Organs: Beneficial for the stomach, intestines, and Liver¹³

Health benefits of Cumin Seeds

1. Promote digestion

Cumin is highly beneficial for digestion, as it stimulates pancreatic enzymes that aid the digestive process. The seeds contain thymol and essential oils, which activate the salivary glands, making digestion easier. For individuals with weak digestion, drinking jeera water on an empty stomach in the morning is recommended to improve digestion and reduce flatulence.

Additionally, cumin acts as a carminative, helping to alleviate gas and enhance both digestion and appetite. Its essential oils, along with magnesium and sodium, provide relief from stomach aches when consumed with warm water.²⁵

2. Loss of Appetite and Altered Taste

(cumin seed) serves as an effective Ayurvedic solution for enhancing appetite and addressing loss of taste. In Ayurveda, these issues are often linked to the

buildup of AMA (toxins) in the body. Jeera helps eliminate these toxins, thereby boosting appetite, increasing the urge to eat, and enhancing taste perception. For this purpose, a dosage of 1/2 teaspoon of jeera can be consumed with warm water.

3..Rich in Iron

Cumin seeds are an excellent source of iron. One teaspoon of ground cumin provides about 1.4 mg of iron, equating to approximately 17.5% of the recommended daily intake for adults. Iron deficiency is widespread, impacting around 20% of the global population, with young children and women of childbearing age being particularly at risk due to their increased iron needs. Cumin is a valuable source of iron, even when used in small quantities as a spice.

4. Lowers Cancer Risk:

Cumin is packed with antioxidants that safeguard the body from damage caused by free radicals. These compounds promote cellular health, minimize oxidative stress, and may decrease the likelihood of chronic illnesses. Incorporating cumin into your diet can help protect cells from damage and support overall well-being. Since DNA oxidation plays a role in cancer development, cumin water, with its potent antioxidants, demonstrates anti-cancer properties by inhibiting cancer cell growth and reducing cancer risk.²⁰

5. Relieves Acidity:

Cumin water acts as a natural antacid, soothing the stomach lining and providing relief from heartburn, acid reflux, and general acidity.²⁰

6.Beneficial During Menstruation and Lactation:

Drinking cumin water can be helpful for women during both menstruation and lactation. During periods, its anti-inflammatory properties help relieve menstrual cramps, easing discomfort and pain. Additionally, cumin water promotes uterine contractions, assisting in the release of trapped blood.^{10,12}

For lactating mothers, the high iron content of cumin seeds water supports increased milk production, ensuring essential nourishment for both the mother and her baby.^{11,10}

7.Boosts Immune System:

Cumin water provides a good supply of potassium and iron, which helps strengthen the immune system.

Its rich vitamin C content, an antioxidant, aids in wound healing. Additionally, cumin water's antibacterial properties help the body ward off infections and boost overall immunity.⁸

8.Reduces Inflammation:

Cumin water possesses strong anti-inflammatory effects due to compounds like cuminaldehyde and thymoquinone, which help alleviate inflammation in the body. This makes cumin water useful in reducing swelling and discomfort, particularly for those suffering from arthritis and joint pain.⁶

9.Hemorrhoids

Cumin seeds benefit hemorrhoids by reducing inflammation, aiding digestion, acting as a natural laxative to promote regular bowel movements, and possessing antioxidant and antimicrobial properties that support healing and prevent infection. Incorporating cumin into the diet may help alleviate discomfort associated with hemorrhoids.⁷

10.Stress

Cumin may assist the body in managing stress. In a study conducted on rats, researchers examined how cumin extract influenced stress indicators. The rats that were given cumin extract prior to a stressful situation exhibited a notably reduced stress response compared to those that did not receive the extract. Cumin's potential to combat stress effects may be linked to its antioxidant properties, with findings indicating that cumin was a more effective antioxidant than vitamin C in the studied rats.²⁵

11 To treat diarrhoea

For centuries, traditional medicine practitioners have advocated the use of cumin to treat diarrhoea, and Western medicine is beginning to recognize this advantage. In a study, an extract of cumin seeds was administered to rats suffering from diarrhoea, leading researchers to conclude that the extract was effective in alleviating their symptoms.¹⁶

12.Helps controls blood sugar

Cumin has been included in herbal drug trials aimed at diabetes management, showing positive results in helping individuals with condition cumin water helps in controlling blood sugar levels by enhancing insulin sensitivity, which can aid in maintaining stable blood glucose levels and reducing the likelihood of sudden spikes or drops. Studies have found that giving

cumin orally to healthy rabbits produced a hypoglycemic effect, significantly lowering the peak area of hyperglycaemia in glucose tolerance curve.²

13. Weight loss

Cumin has been recognized as a potential aid for weight loss due to several mechanisms: Metabolism Boost Cumin seeds may help increase metabolic rate. The compounds in cumin can enhance the body's ability to burn calories more efficiently, which can support weight loss efforts. Fat Reduction: Research has suggested that cumin can help reduce body fat. A study found that consuming cumin as part of a daily diet led to significant reductions in body fat percentage compared to a control group. This may be attributed to cumin's ability to promote fat exudation.²

14. Boost memory

Cumin may enhance the functioning of the central nervous system, leading to improved memory and better motor control. Additionally, it has the potential to assist in the treatment of Parkinson's disease due to its positive effects on the body's central nervous system.²⁵

15. Helps In lower cholesterol

Cumin is known for its hypolipidemic effects, helping the body regulate high fat levels that can

adversely affect heart health and cholesterol. One study found that a dietary supplement of cumin powder combined with yogurt led to lower cholesterol levels. Furthermore, another group of people with high cholesterol saw beneficial results after adding cumin to their diet.

16. Skin disorder

Vitamin E, essential for maintaining youthful and healthy skin, is plentiful in cumin.¹⁶ The oils found in cumin possess antimicrobial and cleansing properties that shield the skin from microbial infections. Additionally, cumin's ability to neutralize free radicals and inhibit melanin production plays a significant role in its skin-brightening effects.²⁰

17. Anti-osteoporotic and rheumatoid arthritis

Cumin contains phytoestrogens that can help prevent osteoporosis and arthritis.²⁰ In studies involving animals treated with a methanol extract of cumin, a significant decrease in urinary calcium excretion was observed, which improved calcium levels and enhanced bone strength.²¹ Additionally, due to the beneficial properties of its bioactive compounds, clinical studies indicate that cumin seeds may be effective in managing autoimmune conditions like rheumatoid arthritis.

Marketed Preparations



CONCLUSION

Cumin seeds offer a wide range of health benefits when added to foods, enhancing both aroma and

flavor. It has a good traditionally used seed with large cultivation in India and other countries. They play a role in boosting the system, helping to prevent microbial infections, and may reduce the risk of

cancer. Additionally, cumin supports healthy blood sugar levels, cholesterol balance, and heart health, making it beneficial for conditions like diabetes and cardiovascular disease. It is generally safe to consume with no known side effects, and it is suitable for use during pregnancy and lactation. Cumin also helps in weight management, supports food preservation, and has anti-diabetic properties to prevent low blood sugar.

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