

# A Review on Health Benefits of Cuminum Cyminum (Cumin)

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**ABSTRACT**-Spices are the elements that give food its taste. Food's fragrance, texture, and color are its main purposes. They also serve as a preservative, as well as providing nutritional and physiological advantages. Cumin (*Cuminum cyminum*) is a blooming plant in the Apiaceae family that is locally known as "zeera." Many eastern cuisines call for it as a condiment and seasoning. Cumin is well-known for its anti-oxidant properties. Seed spices affect a number of biological systems, such as the digestive, circulatory, reproductive, or neurological systems, causing a range of metabolic but also physiologic consequences. Antioxidants, antidiabetic, anticancer, antimicrobial activity, hypolipidemic influence, insecticidal, beneficial in heavy menstrual bleeding, aiding digestion, high blood pressure, instrumentation of enzymes involved, immune function, reduction of inflammatory process, molecular mechanism, modulations of immune systems, The purpose of this research is to have a thorough analysis on the present trends in research here on health advantages of four common seed seasonings: cumin, coriander, but also fennel.

**KEYWORDS**-Antioxidants, Cuminum Cyminum, Cumin, Essential Oils, Spices.

## I. INTRODUCTION

Spice are non-leafy parts of plants (including the bud, rhizome, fruit, seed, bark, or bulb) which are used as flavorings and spices, although many also have medicinal properties. Spice is derived from the Latin term "species," which means "of a certain sort." The term 'herb' is used to distinguish plant parts that perform the same duties but are made up of leaves or soft flowering parts. Both names might apply to same species, with the leaf extracts used as flowers and also the dried parts, including such coriander or dill, used as seasonings. Spices are used in a number of ways in the cooking. They are primarily used to flavor foods, but they may also be used to preserve food to give nutrients and vitamins.

Spices have had a profound effect on human civilization's development. From conception to death, they are a part of

our life. In everyday life, spices feed, heal, relax, and delight us. Spices were widely utilized by ancient peoples such as the Egyptians, Arabs, and Romans not only to flavor food and beverages, but also as medications, sanitizers, fragrance oils, stimulant, or even aphrodisiac chemicals. Spices have long been recognized as medicinal foods. Spices' ability to transmit biological activity is progressively resurfacing as a topic of study in humans health. Seeds spice are an significant category of the farming commodities that contribute significantly to our country's economy. India has long been known as a spice-producing country. Rajasthan or Gujarat have supplied more than 81% of country's total seed spice productions. Coriander, cumin, fennel, and fenugreek are the main seed spices, while ajowan, dill, caraway (siah jeera), celery, nigella (kalonji), or anise are minors seeds spices. Secondary metabolite, also known as phytochemical, are contains natural, physiologically active rich in phytochemicals that operate as a natural defence mechanism for host plants and have previously been exploited as medications, perfumes, dyes, taste compounds, or agrochemicals. Utilizing current biological as well as computer science technology, chemo bioinformatics will assist in the development of novel drugs (1-3).

India has long been recognised for manufacturing spices. More than 81 percent of the country's entire seed spice output has come from Rajasthan or Gujarat. The principal seed spices are coriander, cumin, fennel, and fenugreek, while lesser seed spices include ajowan, dill, caraway (siah jeera), celery, nigella (kalonji), and anise. Secondary metabolites, commonly known as phytochemicals, are natural, physiologically active phytochemicals that function as a natural defence system for host plants and have been used as pharmaceuticals, fragrances, colours, flavour compounds, or agrochemicals in the past. They don't have the same flavor as garam masala, but they're fantastic for amplifying the aromatic experience. Essential oils are used at a really low concentrations of 1.5 percent to 0.06 percent in the finished product. They might irritate the skin, cause

nervous system damage if ingested in high amounts, and even cause allergic reactions or miscarriages.

Terpene atoms are the primary chemical elements of most essential oils. Diverse molecular sizes occur in monoterpenes, diterpenes, triterpenes, and sesquiterpenes. The most volatile terpenes are monoterpenes, which make up the majority of terpenes found in spices. Sesquiterpenes are found in the greatest quantity in the ginger family.

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## II. LITERATURE REVIEW

Jalali Heravi et al. used gas chromatography-mass spectrometry, as well as iterative and non-iterative resolution methods, to characterize the essential oil components of Iranian cumin and caraway. Non-iterative omnidirectional projection resolution (OPR) or iterative range curve resolution-alternative least squares (DS-MCR-ALS) were used as backup methods in the case of overlapping peaks. Cumin and caraway oils generated a total of 18 or 37 components, respectively, based on direct similarity searches. These values were increased to 47 or 99 components, respectively, using chemometric approaches. Cumin's primary compounds are gamma-terpinene (14.82%), 2-methyl-3-phenyl-propanal (33.27%), or myrtenal (12.64%), while caraway's main elements are gamma-terpinene (24.40%), 2-methyl-3-phenyl-propanal (13.20%), as well as 2, 4(10)-thujadien (14.02 percent). Despite their variances in growth conditions, both seeds have 28 components (6).

By spray drying cumin oleoresin microencapsulation efficiency and storage stability, Kanakdande et al. studied cumin oleoresin microencapsulation efficiency and storage stability utilizing gum Arabic, maltodextrin, including modified starch as well as their ternary blends as wall materials. The microcapsules were examined for volatile

content, stability, and total cumin aldehyde, -terpinene, and p-cymene content after a six-week period. However, the order of protection was volatiles>cumin aldehyde> p-cymene> -terpinene, with gum Arabic providing higher protection than maltodextrin and modified starch. The t1/2, or the time it takes for a component to decline to half its original value, revealed that a 4/6:1/6:1/6 combination of gum arabic, maltodextrin, as well as modified starch gave additional security than gum arabic. The ternary blend's protecting impact was not constant across all components, so it follows the sequence of volatile: p-cymenes> cumin aldehyde >-terpinenes (7).

E. Lee investigated the therapeutic properties of cumin. He tested the inhibitory activity of 11 commercially available *Cuminum cyminum* seed oil components, but also quercitrin, an aldose reductase inhibitor, as well as acarbose, an R-glucosidase inhibitor, against lens aldose reductase but also R-glucosidase isolated from Sprague-Dawley male rats' lens aldose reductase and R-glucosidase. Cuminaldehyde has been found as the physiologically active ingredient of *C. cyminum* seed oil in a number of investigations. Cuminaldehyde inhibits aldose reductase with an IC50 of 0.00085 mg/mL and R-glucosidase with an IC50 of 0.5 mg/mL. Cuminaldehyde's inhibitory effect was 1.8 and 1.6 times smaller than that of acarbose or quercitrin, respectively. According to the author, cuminaldehyde might be useful as a lead molecule or a new drug for anti-diabetic therapy (8).

Seed spices are an important category of agricultural commodities that play a considerable role in our national economy, according to S. Rathore et al. India has long been recognized for manufacturing spices. The umbelliferae family includes coriander, cumin, and fennel, whereas the Fabaceae family includes fenugreek. These spices are made up of a variety of volatile and non-volatile components. These spices have been used as a medicinal food for generations. The power of seed spices to impart biological activity is progressively reviving as a hot issue in human health. Secondary metabolites, also known as phytochemicals, are naturally occurring, physiologically active chemical compounds found in plants that operate as a natural defense mechanism for host plants and have previously been exploited as medications, perfumes, and taste components. They're a gold mine of possibilities in our search for useful bioactive molecules for pharmacology and other health-related issues. Seed spices affect a number of biological systems, including the digestive, circulatory, reproductive, and neurological systems, causing a range of metabolic and physiologic consequences. Antioxidants, anticancer, antidiabetic, antimicrobial activity, hypolipidemic effect, insecticidal, useful in heavy menstrual bleeding, aiding digestion, hypertension, instrumentation of enzymatic antioxidants, immune modulation, reduction of inflammatory process, molecular mechanism, molecular mechanism, modulation of the immune system, molecular mechanism, modulation of the immune system, molecular mechanism, modulation of The

purpose of this research is to provide a thorough report on the present level of knowledge on the potential health advantages of four common seeds spices: cumin, fennel, coriander, and fenugreek (9).

### III. CUMIN (CUMINUM CYMINUM)

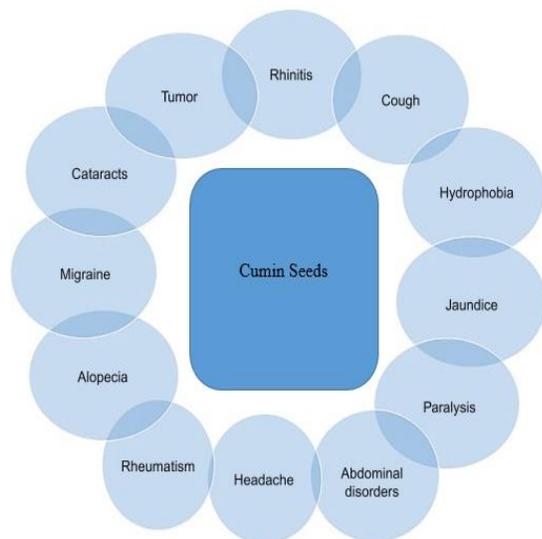


Figure 1: Represents the health benefits of cumin seed

Cumin seed has a number of health benefits, as seen in Figure 1. Cumin seed contains antioxidants known as apigenin or luteolin, which already have antioxidant qualities. Antioxidant activities have been discovered in the hydrocarbon ethanol soluble portion of cumin. Cuminaldehyde has been found to have been a scavenger of superoxide anion. Cumin seeds have been unearthed in thousands-year-old archeological sites at Syria. The word made its way from Syria through Turkey and Greece before arriving in Spain. Cumin, like several other Arabic words in English, arrived in Western Europe via Spain rather than Greece. The phrase is said to be derived from the Latin *cuminum* and the Greek word *kuivov*. It's a Greek term derived from an Arabic word. This phrase is known as 'kamunu' in various ancient Local dialects, including Akkadian. The ultimate source is assumed to be the Sumerian word *gamun*. Cumin is a popular spice in Pakistan or India cooking. Cumin seeds have been shown to prevent the production of stomach squamous cell carcinomas, indicating that the spice has anticancer properties. Cumin was shown to have a preventive effect against caused colon cancer in rats. Other metabolic changes were reversed by dietary cumin, as shown by decreased bloods urea levels or reduced urea as well as creatinine excretions in diabetic rats. Dietary cumin substantially reduced the increased plasma urea level of diabetic rats by approximately 50%. Cumin is one of the components in a natural antidiabetic medication that has been shown to be beneficial of human trials (10,11).

#### A. Essential Oil Content of Cumin

Cumin seeds have been shown to prevent the production of stomach squamous cell carcinomas, indicating that the spice has anticancer properties. Cumin was shown to have a preventive effect against caused colon cancer in rats. Other metabolic changes were reversed by dietary cumin, as shown by decreased bloods urea levels or reduced urea as well as creatinine excretions in diabetic rats. Dietary cumin substantially reduced the increased plasma urea level of diabetic rats by approximately 50%. Cumin is one of the components in a natural antidiabetic medication that has been shown to be beneficial of human trials. Cumin seed contains antioxidants known as apigenin or luteolin, which already have antioxidant qualities. Antioxidant activities have been discovered in the hydrocarbon ethanol soluble portion of cumin. Cuminaldehyde has been found to have been a scavenger of superoxide anion.

However, flakes provided much more oil (3.3 percent) than ground samples (2.8 percent) in larger batch operations, suggesting that flaking has an advantage over grinding. In both cases, the aqueous fraction of the distillate had the same quantity of volatile oil (0.2 percent). Oil extracted from flakes preserved lower boiling terpene components and the character impact ingredient, cumin aldehyde, than oil derived from powder, according to flavor profiles of volatile oils.

*Cuminum cyminum* essential oil is extracted utilizing a combination of organic solvent & steam distillations. Effects of the numerous parameter on extraction yield, including particle size, temperature, and extraction time, were investigated. Temperature had the biggest influence on extract yield, follow by the extractions duration & particles sizes (oleoresin). The essentials oils of seed was extracted using supercritical carbon dioxide to compare the extraction procedures (OS-SD). Had 45 components, showing that the composition of essential oils extracted using different methods was substantially identical. The essential oil in cumin gives it a unique aroma. The odor or taste are caused by the presence of aldehydes.

#### B. Composition

Cumin seed has 7 percent moisture, 3–4% volatile oil, 12 percent protein, 10 percent total ash, 11 percent fiber, 33 percent carbohydrate, 11 percent starch, and 11 percent fat (15 percent). Cumin's composition changes depending on where it's grown and how it's processed. The lipid content of cumin seed lipids has been examined. Cumin was shown to have a preventive effect against caused colon cancer in rats. Other metabolic changes were reversed by dietary cumin, as shown by decreased bloods urea levels or reduced urea as well as creatinine excretions in diabetic rats. Dietary cumin substantially reduced the increased plasma urea level of diabetic rats by approximately 50%. Dietary fibres, both insoluble or soluble, are really the storing state of polysaccharides found in plant cell walls that cannot be digested by human digestive enzymes. With the exception of a few spices, there seems to be little data on dietary fibre

content of spices. Cumin is claimed to comprise 15–45 percent crude fibre. Cumin collection of waste, the with bulk going to boiler feed but just a little quantity going to veterinary feed ingredients. Cumin waste, which has no economic value, was studied for its quality, physicochemical qualities, and use potential as a new functional food ingredient. Cumin was shown to have a preventive effect against caused colon cancer in rats. Other metabolic changes were reversed by dietary cumin, as shown by decreased bloods urea levels or reduced urea as well as creatinine excretions in diabetic rats. Dietary cumin substantially reduced the increased plasma urea level of diabetic rats by approximately 50%.

#### IV. CROP AND PRODUCTION

Rajasthan and Gujarat, India's two most populous states, are the primary producers. Rajasthan is India's largest cumin producer, with 0.12 million tons adding to the country's total output in 2003–2004. With about 0.025 million hectares of cumin-growing land, it also possesses the most cumin-growing land. Gujarat is India's second-largest cumin seed producer. 90 percent of the country's entire production is produced in Rajasthan and Gujarat. Cumin seed is exported from India to Bangladesh, Japan, Malaysia, Nepal, Pakistan, Singapore, South Africa, the UAE, the UK, and the US. India is the world's largest producer of cumin seeds, with annual output ranging from 0.1 to 0.2 million tons and a monopoly on the worldwide market. Syria is rated second on the list, having produced 25,000 tons. Because India has the greatest cumin-growing region, this plainly proves that it is much more dominant in cumin production than any other country. Turkey and Iran both produce the same quantity of garam masala, ranging from 15,000 and 20,000 tons, placing them third and fourth, respectively, among the top producers. Despite producing far less cumin than India, Syria, Turkey, and Iran have a comparable influence on worldwide cumin prices. In 2005–2006, India produced 0.11 million tons of cumin, with 12000 tons exported.

#### V. DISCUSSION

Cumin has many health advantages, including anti-diabetic, antibacterial, antiseptic, and antioxidant properties, as well as prevention of blood platelet aggregation. Cumin's flavonoids apigenin and luteolin, as well as their glycosides, are thought to be responsible for many of the plant's biological functions. The antibacterial and anti-mutagenic effects of volatile oil are due to cuminaldehyde, a significant component. Cumin wasted residue has the potential to be a unique source of nutritious fibre that may be employed in a wide range of culinary applications. Cumin seeds have been shown to prevent the production of stomach squamous cell carcinomas, indicating that the spice has anticancer properties. Cumin was shown to have a preventive effect against caused colon cancer in rats. Other metabolic changes were reversed by dietary cumin, as

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#### VI. CONCLUSION

Cumin has a significant antioxidant capacity, according to the findings of this study. Spice essential oils contain large amounts of antioxidant compounds with antioxidant properties, whereas their nonvolatile preparations have good free radical fairly limited. In terms of antioxidant properties, methanolic leaf extract surpassed n-hexane extracts. Nonvolatile extracts' total phenolic content and antioxidant activity are also substantially associated. Cumin has a high antioxidant potential as a consequence of this study, and it might be used to generate novel antioxidant compounds and also flavoring elements for a range of culinary products.

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