World Journal of Pharmaceutical Sciences
ISSN (Print): 2321-3310; ISSN (Online): 2321-3086

Available online at: http://www.wjpsonline.org/
Review Article

Cumin: A spice or a drug?

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Received: 26-03-2014 / Revised: 12-04-2014 / Accepted: 16-04-2014

ABSTRACT

Cumin *(Cuminum cyminum)*, an aromatic plant is originally from the mediterranean region. It is a popular spice, for which the whole or ground dried ripe fruit, commonly called seed used. It is a major ingredient in both chili powder and curry, and is added to meat sauces, rice, bread, pickles, soups and other foods. Roman caraway is another common name for this member of the parsley family (Apiaceae). The only species in its genus, cumin exhibits a variety of plant types depending on the seed source. A small annual herb about 1-2 ft (0.3-0.6 m) tall, cumin grows upright as a single slender stem with many branches. Cumin seeds are rich sources of essential oils and have been actively researched for their chemical composition and biological activities. The strong, pungent green-spicy odor and flavor of cumin is attributable largely to cuminaldehyde, the main constituent of the essential oil, and other aldehydes. The prominent medicinal properties of cumin include anti-oxidant, antimicrobial, anti-carcinogenic/anti-mutagenic, anti-diabetic, immunomodulatory, anti-epileptic, estrogenic/anti-osteoporotic, anti-tussive, anti-aggregatory. So in the above light, we have made an attempt to compile up all the facts about cumin.

KEYWORDS: cumin, cuminum cyminum, cuminaldehyde, immunomodulatory, estrogenic

INTRODUCTION

Cuminum cyminum, belonging to the family Apaiaceae, is one of the earliest cultivated herbs in Asia, Africa and Europe. Cumin seeds from *Cuminum cyminum*, have remained popular as culinary spices and are also overwhelmingly used in folklore therapy since antiquity in diverse geographical areas. The aromatic substances present in these herbs have attracted enormous attention of researchers worldwide to experimentally validate the therapeutic uses of cumin seeds, which are documented in several indigenous healing systems.

BOTANICAL CLASSIFICATION OF CUMIN

Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Apiales
Family	Apiaceae
Genus	Cuminum L.
Species	Cuminum cyminum L.

INTERNATIONAL NAMES ARE AS FOLLOWS:

Language	**Name**
Spanish	Comino
French	Cumin
German	Romischer Kummel
Swedish	Spiskummin
Arabic	Kammun
Dutch	Komijn
Italian	Comino
Portuguese	Cominho
Russian	Kmin
Chinese	Machin

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INDIAN NAMES:

Language	Name
Hindi	Jira, Safaid Jeera, Zeera
Punjabi	Jira, Safaid Jeera
Bengali	Jeere
Gujarati	Jeeru
Kannada	Jeerige
Kashmiri	Zyur
Malayalam	Jeerakam
Marathi	Jeregire
Oriya	Jeera
Sanskrit	Jiraka, Jeera
Sindhi	Zero
Tamil	Ziragum
Telugu	Jidakara, Jikaka

History: Cumin has been in use since ancient times. Seeds excavated at the Syrian site Tell ed-Der have been dated to the second millennium BC. They have also been reported from several New Kingdom levels of ancient Egyptian archaeological sites. Originally cultivated in Iran and Mediterranean region, cumin is mentioned in the Bible in both the Old Testament (Isaiah 28:27) and the New Testament (Matthew 23:23). It was also known in ancient Greece and Rome. The Greeks kept cumin at the dining table in its own container (much as pepper is frequently kept today), and this practice continues in Morocco. Cumin fell out of favour in Europe, except in Spain and Malta, during the middle Ages. It was introduced to the Americas by Spanish and Portuguese colonists. There are several different types of cumin but the most famous ones are black and green cumin which are both used in Persian cuisine. Today, it is mostly grown in Iran, Uzbekistan, Tajikistan, Turkey, Morocco, Egypt, India, Syria, Mexico, Chile, and China. The plant occurs as a rare casual in the British Isles, mainly in southern England, but the frequency of its occurrence has declined greatly. According to the Botanical Society of the British Isles' most recent Atlas, there has been only one confirmed record since 2000.

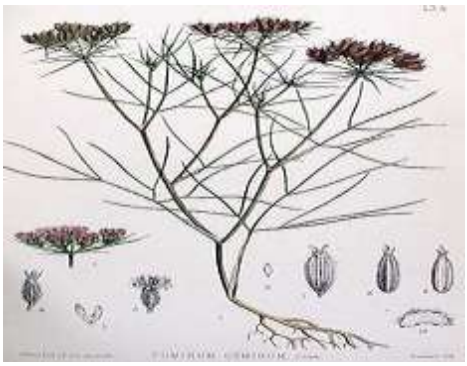
Botanical Description: Cumin is the dried seed of the herb *Cuminum cyminum*, a member of the parsley family. The cumin plant grows to 30-50 cm (0.98-1.6 ft) tall and is harvested by hand. It is an herbaceous annual plant, with a slender branched stem 20-30 cm tall. The leaves are 5-10 cm long, pinnate or bipinnate, thread-like leaflets. The flowers are small, white or pink, and borne in umbels. The fruit is a lateral fusiform or ovoid achene 4-5 mm long, containing a single seed. Cumin seeds resemble caraway seeds, being oblong in shape, longitudinally ridged, and yellow-brown in color, like other members of the Umbelliferae family such as caraway, parsley and dill.

Geographical Description: Cumin, besides being used medicinally, was in the Middle Ages one of the commonest spice of European growth. It is a small annual, herbaceous plant, indigenous to Upper Egypt, but from early times was cultivated in Arabia, India, China, and in the countries bordering on the Mediterranean. India holds a major position in the world production of Cumin. Rajasthan alone contributes about 56% of the total Indian production complemented by Gujarat with 44%.

Cultivation: Cultivation of cumin requires a long, hot summer of 3-4 months, with daytime temperatures around 30 °C (86 °F); it is drought-tolerant, and is mostly grown in Mediterranean climates. It is grown from seed, sown in spring, and needs fertile, well-drained soil. They should be sown in small pots, filled with light soil and plunged into a very moderate hot bed to bring up the plants. These should be hardened gradually in an open frame and transplanted into a warm border of good soil, preserving the balls of earth which adhere to the roots in the pots. Keep clean of weeds and the plants will flower very well. The plants are threshed when the fruit is ripe and the 'seeds' dried.

Harvesting Season: February to March

Marketing Season: April to May



Cuminum cyminum Linn

Phytoconstituents: The major compounds occurring in cumin are cuminaldehyde, limonene, α- and β-pinene, 1,8-cineole, *o*- and *p*-cymene, α- and γ-terpinene, safranal and linalool. In aqueous and solvent derived seed extracts, diverse flavonoids, isoflavonoids, flavonoid glycosides, monoterpenoid glucosides, lignins and alkaloids and other phenolic compounds have been found. [1],[2],[3],[4] In a recent study, a nonspecific lipid transfer protein has been isolated from the

cumin seed[5]. Several nutrients (vitamins, amino acids, protein, and minerals), starch, sugars and other carbohydrates, tannins, phytic acid and dietary fiber components have also been found in cumin seeds. [6], [7] The strong aromatic smell and warm, bitterish taste of Cumin fruits are due to the presence of a volatile oil which is separated by distillation of the fruit with water, and exists in the proportion of 2 to 4 per cent. It is limpid and pale yellow in colour, and is mainly a mixture of cymol or cymene and cuminic aldehyde, or cyminol, which is its chief constituent. The tissue of the fruits contains fatty oil with resin, mucilage and gum, malates and albuminous matter, and in the outerseed coat there is much tannin. The yield of ash is about 8 per cent.

PHARMACOLOGICAL ACTIVITIES

Antioxidant: Cumin (oil as well as the aqueous and solvent derived extract) have shown significant antioxidant activity in several test methods. These effects are documented as their ability to prominently quench hydroxyl radicals, 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals and lipid peroxides. The other assays employed were ferric thiocyanate method in linoleic acid system, Fe^{2+} ascorbate-induced rat liver microsomal lipid peroxidation (LPO), soybean lipoxygenase dependent lipid peroxidation and ferric reducing ability. The cumin oil exhibited high antioxidant activity which has been attributed largely to the presence of monoterpene alcohols, linalool, carvacrol, anethole and estragol, flavonoids and other polyphenolic compounds. The antiradical profile of cumin has been proposed as the underlying mechanism for its multifaceted pharmacological properties such as antimicrobial, antidiabetic, anticarcinogenic/antimutagenic, antistress, antiulcerogenic, etc. as outlined in the succeeding sections. [8], [9], ,[10], [11], [12], [13]

Antimicrobial: Numerous investigations have revealed a potential antimicrobial activity of cumin (oil as well as the aqueous and solvent derived extract). This antibacterial action was assessed against a range of useful and pathogenic gram-positive and gram-negative bacterial strains [14]. Cumin seed oil and alcoholic extract inhibited the growth of *Klebsiella pneumoniae* and its clinical isolates and caused improvement in cell morphology, capsule expression and decreased urease activity. This property was attributed to cuminaldehyde[15]. Biofilm-formation preventive properties were found against *Streptococcus mutans* and *Streptococcus pyogenes*. Limonene, eugenol, pinene and some other minor constituents have been suggested to contribute to the antimicrobial activity of cumin oil. Antifungal activity of cumin oil is recorded against soil, food, animal and human pathogens, including dermatophytes, *Vibrio* spp., yeasts, aflatoxins and mycotoxin producers. [16]

Anticarcinogenic/antimutagenic: In independent studies, dietary supplementation of cumin was found to prevent the occurrence of rat colon cancer induced by a colon-specific carcinogen, 1,2-dimethylhydrazine (DMH). In cumin receiving animals, no colon tumors were observed. The excretion of fecal bile acids and neutral sterols was significantly increased, and cumin was shown to protect the colon and to decrease the activity of β-glucuronidase and mucinase enzymes. β-glucuronidase increases the hydrolysis of glucuronide conjugates and liberates the toxins, while the increase in mucinase activity may enhance the hydrolysis of the protective mucins in the colon. Histopathological studies also showed lesser infiltration into the submucosa, fewer papillae and lesser changes in the cytoplasm of the cells in the cumin-treated colon. In cumin-treated rats, the levels of cholesterol, cholesterol/phospholipid ratio and 3-methylglutaryl COA-reductase activity were reduced.[17], [18] Dietary cumin inhibited benzopyrene-induced forestomach tumorigenesis, 3-methylcholanthrene induced uterine cervix tumorigenesis, and 3-methyl-4-dimethyaminoazobenzene induced hepatomas in mice. This was attributed to the ability of cumin in modulating carcinogen metabolism via carcinogen/xenobiotic metabolizing phase I and phase II enzymes. Activities of cytochrome (CYP) P-450 reductase and CYP b5 reductase were augmented, whereas phase II enzymes GST and DT-diaphorase were increased. [19] Monoterpenes like anethofuran, carvone, and limonene occurring in cumin have specifically been highlighted for anticarcinogenic action. Many studies have

related the anticarcinogenic actions of cumin to its potential apoptotic, antimutagenic and antiproliferative properties.

Antidiabetic: The antidiabetic effects of cumin are amply documented. In a glucose tolerance test conducted in rabbits, cumin significantly increased the area under the glucose tolerance curve and hyperglycemic peak. A methanolic extract of cumin seeds reduced the blood glucose and inhibited glycosylated hemoglobin, creatinine, blood urea nitrogen and improved serum insulin and glycogen (liver and skeletal muscle) content in alloxan and streptozotocin (STZ) diabetic rats[20], [21]. The collateral benefits included decreased creatinine, urea nitrogen and improved insulin and glycogen in tissue and skeletal muscles, accompanied by a reduction in rat tail tendon collagen-linked fluorescence and pepsin digestion which are implicated in the pathogenesis of diabetic microvascular complications. In another study, an aqueous extract of cumin prevented *in vitro* glycation of total soluble protein, α-crystallin, and delayed the progression and maturation of STZ-induced cataract in rats. Cumin prevented loss of chaperone activity in diabetic rats and also attenuated the structural changes of α-crystallin in lens, which is a long-lived protein and is susceptible to several post-translational modifications in certain diabetic conditions. Eight-week sub-acute administration of cumin to STZ-diabetic rats reduced hyperglycemia and glucosuria accompanied by an improvement in body weight, blood urea and reduced excretion of urea and creatinine. Oral administration of cumin also showed hypoglycemic effect in normal rabbit, resulting in significant decrease in the area under the glucose tolerance curve. The biologically active constituent of cumin seed oil was characterized as cuminaldehyde which inhibited aldose reductase and alpha-glucosidase isolated from rat[22]. .In hyperglycemia associated with diabetes, the use of aldose reductase inhibitors has shown efficacy in attenuating diabetic complications. Hyperlipidemia is an associated complication of diabetes mellitus. Oral administration of cumin to alloxan diabetic rats reduced body weight, plasma and tissue cholesterol, phospholipids, free fatty acids and triglycerides. Histological observations demonstrated significant decrease in fatty changes and inflammatory cell infiltrates in diabetic rat pancreas. Cumin suppressed alcohol and thermally oxidized oil induced hyperlipidemia. It decreased aspartate transaminase (AST), alkaline phosphatase (ALP) and γ-glutamyl transferase (GGT) activities and decreased the tissue (liver and kidney) levels of cholesterol, triglycerides and phospholipids and prevented the changes in the composition of fatty acids in the plasma of rats administered with alcohol and/or thermally oxidized oil. The activity of phospholipase A and C decreased significantly. [23] Hypocholesterolemic effect of methanolic extract of cumin is also documented in ovariectomized rat in relation to its anti-osteoporotic effect.[24] . Cumin added to hypercholesterolemic diet decreased serum and liver cholesterol in rats.

Immunomodulatory: In a recent study, oral treatment with cumin showed immunomodulatory properties in normal and immune-suppressed animals via modulation of T lymphocytes' expression in a dose-dependent manner. It stimulated the T cells' (CD4 and CD8) and Th1 cytokines' expression in normal and cyclosporine-A induced immune-suppressed mice. In restraint stress-induced immune-suppressed animals, the active compound of cumin countered the depleted T lymphocytes, decreased the elevated corticosterone levels and size of adrenal glands and increased the weight of thymus and spleen [25].

CNS: Administration of cumin oil suppressed the development and expression of morphine tolerance (as measured by tail-flick method). The morphine dependence was also reversed in a dose-dependent manner as evaluated by decreased conditioning scores (the acquisition and expression of morphine-induced conditioned place preference) in mice [26]. Anti-epileptic activity of cumin oil is documented. It decreased the frequency of spontaneous activity induced by pentylenetetrazol (PTZ). This protection was measured in a time- and concentration-dependent manner as increased duration, decreased amplitude of hyperpolarization potential, the peak and firing rate of action potential and excitability of nerve cells [27].

Cumin oil was found to attenuate seizures induced by maximal electroshock and PTZ in mice. Cumin oil has also been found to possess significant analgesic action in a chemical model (formalin test) of nociception in rat. Cuminaldehyde was found to be a tyrosinase inhibitor and prevented the oxidation of l-3.5-dihydroxyphenyklalanine (l-DOPA) [28].

Estrogenic/anti-osteoporotic: Cumin seeds are reported to be estrogenic [29] .The presence of phytoestrogens in cumin has been shown and also related to its anti-osteoporotic effects. In the animals receiving a methanolic extract of cumin, a significant reduction in urinary calcium excretion and augmentation of calcium content and mechanical strength of bones was found. Animals showed greater bone and ash densities and improved microarchitecture, with no adverse effects like body weight gain and weight of atrophic uterus.

Gastrointestinal: Perfusion of an aqueous extract of cumin via the stomach of pentobarbitone-anesthetized rats under the aspirin-induced gastric mucosal injury showed an increased acid secretion by a cholinergic mechanism.Aqueous and solvent derived extracts of cumin increased amylase, protease, lipase and phytase activities[30].

Other biodynamic actions: Aqueous extract of cumin was found to be antitussive and produced relaxant effect on guinea pig isolated tracheal chain via its stimulatory effect on beta-adrenoreceptors and/or histamine H1 receptors [31]. An ethereal extract of cumin showed antiaggregatory activity and inhibited eicosanoid synthesis. It inhibited arachidonic acid (AA)-induced platelet aggregation and also thromboxane B2 production from exogenous AA; a simultaneous increase in the formation of lipoxygenase-derived products was also observed. Cumin extract also inhibited collagen and adrenaline-induced aggregation[32]. Acute and subchronic administration of cumin oil decreased WBC count and increased the hemoglobin concentration, hematocrit, and platelet counts. LDL/HDL ratio was reduced to half. An aqueous extract of cumin seeds showed protective action against gentamycin-induced nephrotoxicity [33]. It decreased the gentamycin-induced elevated levels of serum urea, creatinine, lipid peroxidation and enhanced the clearance of the drug.

Drug bioavailability enhancing activity: In recent studies, a significant pharmacokinetic interaction of some herbal products from cumin and caraway with anti-tubercular drugs has been revealed. An aqueous extract derived from cumin seeds produced a significant enhancement of rifampicin levels in rat plasma. This bioenhancer activity was found to be due to a novel flavonoid glycoside isolated from cumin. This was identified as 3′,5-dihydroxyflavone 7-O-β-d-galacturonide-4′-O-β-d-glucopyranoside, which enhanced the peak concentration (C_{max}) and area under the curve (AUC) of rifampicin by 35 and 53%, respectively, when co-dosed with this molecule. The altered bioavailability profile of anti-TB drugs could be attributed to a permeation enhancing effect of cumin [34].

Medicinal Uses: Cumin has been used therapeutically for thousands of years and it has a number of healing and curative properties that are listed below. Researchers today are now beginning to look at the components of cumin and study the beneficial effects that cumin has on the body. Although cumin has long been known for its digestive properties, there are also many other ways in which cumin is said to keep the body healthy and heal the unhealthy body.

- Cumin is a very good source of iron, which is needed to transport oxygen to all the cells within the body.
- Cumin helps the body to absorb nutrients efficiently.
- It is said to be a good general tonic and stimulant for the body.
- It has been used to treat chest and lung disorders such as pneumonia and coughs.
- Researchers are studying the anti-carcinogenic properties of cumin. It is found to prevent liver and stomach tumours forming in animals.
- A paste made from cumin seeds and peppermint oil placed on the abdomen is said to relieve abdominal pains and liver disorders.
- Cumin relieves flatulence, bloating, gas and other related stomach ailments.

- Cumin is a diuretic.
- It can relax muscles and prevent muscle cramps.
- Cumin is said to help mothers produce more milk to feed their newborn babies.
- Cumin is sometimes used as an antiseptic and also has antibacterial properties.
- Cumin can reduce nausea and sickness, even during pregnancy.

Bay-salt and Cumin-seeds mixed, is a universal remedy for the diseases of pigeons, especially scabby backs and breasts. The proportions of the remedy are: 1/4 lb. Baysalt, 1/4 lb. Common Salt, 1 lb. Fennel-seeds, 1 lb. Dill-seeds, 1 lb. Cumin-seeds, 1 OZ. Assafoetida; mix all with a little wheaten flour and some fine-worked clay; when all are well beaten together, put into two earthen pots and bake them in the oven. When cold, put them on the table in the dove-cote; the pigeons will eat it and thus be cured.

Culinary Uses: Cumin seeds have an aromatic odor and a spicy and somewhat bitter taste. These are largely used as condiment and form an essential ingredient in all mixed spices and curry powders for flavoring soups, pickles, curries, and for seasoning breads, cakes etc.

Aroma Profile: Cumin's distinctive flavour and strong, warm aroma are due to its essential oil content. Its main constituent and important aroma compound is cuminaldehyde (4-isopropylbenzaldehyde). Other important aroma compounds of toasted cumin are the substituted pyrazines, 2-ethoxy-3-isopropylpyrazine, 2-methoxy-3-*sec*-butylpyrazine, and 2-methoxy-3-methylpyrazine. Other components include beta-Pinene and Gamma-terpinene

CONFUSION WITH OTHER SPICES

Black Cumin seeds (*Nigella sativa*)

Cumin Seeds (*Cuminum cyminum)*

Cumin is sometimes confused with caraway (*Carum carvi*), another umbelliferous spice. Cumin is however hotter to the taste, lighter in color, and larger. Many European languages do not distinguish clearly between the two though. Many Slavic and Finno-Ugric languages referring to cumin as "Roman caraway". In Swedish and Norwegian, caraway is called *kummin* while cumin is *spiskummin*, from the word *spise*, to eat, while in German, *Kümmel* stands for caraway and *Kreuzkümmel* denotes cumin. The distantly related *Bunium persicum* and the unrelated *Nigella sativa* are both sometimes called black cumin (*q.v.*).

CUMIN TEA

Cumin Tea Recipe: Take one teaspoon of cumin seeds and one cup of filtered water in a container. Heat the mixture till the water starts boiling. Reduce the heat, and allow simmering for about 2-3 minutes. Remove from heat, cover the container for ten minutes. Now, the cumin tea is ready for drinking. You can add a pinch of salt and a teaspoon of coriander leaf juice to enhance the taste. Drink cumin tea a couple of times a day to get relief from illnesses.

Cumin Tea Benefits

- Cumin tea is a great expectorant, i.e. it promotes the process of coughing and spitting out. This is because it helps in the loss of phlegm from the throat and lungs.
- Due to its antiseptic properties, it assists in the overall cure of various respiratory system disorders like sinusitis, pneumonia, bronchitis, common cold, etc.
- Cumin tea is considered to be one of the best home remedies for acute

abdominal pain or colic, especially in infants.

- Midwives in Latino cultures use cumin tea to induce labor. Only one cup a day is recommendable for labor induction. Another therapeutic cumin tea benefits is that it helps in the treatment of urinary tract infection.
- It is rich in iron. Therefore, it provides a great help in the treatment of anemia.
- Cumin tea acts as a revitalizing agent. It eases the condition of tiredness and fatigue.
- It provides you relief from flatulence, nausea, diarrhea, morning sickness, indigestion and atonic dyspepsia.
- One of the major health benefits of cumin tea is the treatment of insomnia and other sleeping disorders.
- If you are a frequent sufferer of hiccups, cumin tea may prove to be of some help to you.
- Cumin tea benefits in curing sore throat. Mix 1-2 drops of ginger juice to it, to enhance its effects.
- It detoxifies your body. It is known as a herbal cleanser for kidney and bladder.
- Another cumin tea benefit is that it acts as an ointment to treat boils and wounds.
- You can use cumin as a mouth freshener. Chewing roasted cumin seeds or drinking cumin tea regularly reduces excessive saliva production and heals mouth sores.
- Though not scientifically proven, cumin tea made from black cumin seeds is believed to treat arthritis and asthma.
- Cumin seeds or cumin tea have anti-carcinogenic properties. Thus, it helps in the prevention of various types of cancer.

TRADITIONAL USES:

- In the traditional therapies, cumin seeds are prominently considered carminative, eupeptic, antispasmodic, astringent and used in the treatment of mild digestive disorders, diarrhoea, dyspepsia, flatulence, morning sickness, colic, dyspeptic headache and bloating, and are said to promote the assimilation of other herbs and to improve liver function.
- They have also been used in bronchopulmonary disorders and as a cough remedy, as well as an analgesic.
- In Iranian traditional medicine, cumin is considered stimulant, carminative and astringent and its therapeutic effects have been described on gastrointestinal, gynaecological and respiratory disorders, and also for the treatment of toothache, diarrhoea.
- In traditional medicine of Tunisia, cumin is considered abortive, galactagogue, antiseptic, antihypertensive herb, while in Italy it is used as a bitter tonic, carminative and purgative.
- In Indigenous Arabic medicines, the seeds are documented as stimulant, carminative, and attributed with cooling affect and therefore form an ingredient of most prescriptions for gonorrhoea, chronic diarrhoea and dyspepsia; externally, they are applied in the form of poultice to allay pain and irritation of worms in the abdomen.
- Seeds reduced to powder, mixed with honey, salt and butter are applied to scorpion bites.

SAFETY PROFILE

Cumin seems to be safe for most adults. The side effects of cumin are not known.

Precautions and Contraindications:

Do not take cumin if:

- You are pregnant or breast-feeding.
- You are scheduled for surgery in the next two weeks.

INTERACTIONS:

Cumin might decrease blood sugar. Diabetes medications are also used to lower blood sugar. Taking cumin along with diabetes medications might cause your blood sugar to go too low. Monitor your blood sugar closely. The dose of your diabetes medication might need to be changed.

CONCLUSION

In the nutshell we can say that cumin, not only enjoys an important place in spices but it also has many pharmacological activities which are of diverse importance. Not only can it be used for its taste but also as a preventive measure for various ailments. It is quite safe to use as no side effects has been reported so far but it should not be taken in pregnancy or breast feeding and as it reduces the blood sugar level should not be combined with anti-diabetics to prevent hypoglycaemia. It has been used in traditions for various affects but still it is a drug of concern for the researchers as many of its activities are still hidden.

NUTRITIONAL FACTORS

Elements	**Amount (per 100 gm)**
Energy	1,567 kJ (375 kcal)
Carbohydrates	44.24 g
Sugars	2.25 g
Dietary fiber	10.5 g
Fat	22.27 g
Saturated	1.535 g
Protein	17.81 g
Water	8.06 g
Vitamin A equiv.	64 µg (8%)
Riboflavin (vit. B_2)	0.327 mg (27%)
Niacin (vit. B_3)	4.579 mg (31%)
Vitamin B_6	0.435 mg (33%)
Folate (vit. B_9)	10 µg (3%)
Vitamin B_{12}	0 µg (0%)
Vitamin C	7.7 mg (9%)
Vitamin E	3.33 mg (22%)
Vitamin K	5.4 µg (5%)
Calcium	931 mg (93%)
Iron	66.36 mg (510%)
Magnesium	366 mg (103%)
Phosphorus	499 mg (71%)
Potassium	1788 mg (38%)
Sodium	168 mg (11%)
Zinc	4.8 mg (51%)

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