
APPLICATIONS AND UTILIZATION OF CORIANDER – A

Chaynika Verma*

ABSTRACT

Coriander is a major seed spice widely cultivated and used in India for its characteristic flavour and health benefits. It finds its applications both as a culinary herb & in traditional Chinese and Ayurvedic medicines. For centuries it is believed to have healing and therapeutic properties. All parts of the plant can be utilized for various potential applications. Common uses include garnishing of curries, use in perfumery, chocolates, meat products, beverages, etc. The essential oil obtained from coriander fruit is widely used in aromatherapy for healing digestive problems, including flatulence, indigestion and constipation, to eliminate toxins, to stimulate circulation, to ease migraine and to treat rheumatism and arthritis as it possesses analgesic, stimulating, anti-bacterial, anti-infectious and carminative properties. Researchers have proved that processed coriander fruits exhibit hypolipidemic, antibacterial, antiplatelet, immunomodulatory, antidiabetic and antioxidant properties. Commercially the coriander fruits are extensively used in its powdered form. The leaves are an integral part of Indian cuisine while the oleoresin and the essential oil are the value added products which find a renowned place in the export market.

Keywords – Coriander, Medicine, Digestion, Fruit, Leaves, Powder

*Shaheed Rajguru College of Applied Sciences, Department of Food Technology, University of Delhi.

I. INTRODUCTION

Coriander is a herbaceous plant widely grown as a spice crop. Its name is derived from the Greek word 'koris', which means bedbug because of the bug like odour of the leaf and unripe fruit. Coriander is native of southern Europe and Asia Minor. Farrell (1999) described it as indigenous to near east and mediterranean region of North Africa and Southern Europe. According to early Sanskrit writings, it is being cultivated in India since 5000 B.C. It is believed to be used as an ingredient of traditional and folk medicines for more than 2000 years [13]. It is an annual aromatic herb. *C. sativum* is widely cultivated in India for its spice value and is also a great aid to natural health. It can be used as an essential oil, in natural medicine practices, such as Chinese and Ayurvedic Medicine, and drunk as a medicinal tea. Coriander is also used as a culinary herb and for flavouring in modern remedies used to treat digestive ailments. It is a common ingredient in Indian cuisine. The herb yields two products, the fresh green leaves and the spicy dried whole mature fruits possessing sweet, aromatic odour. Both are utilized for flavouring. All parts of the plant are edible, but the fresh leaves and the dried seeds are commonly used in cooking.

II. TRADITIONAL USES

Coriander has been used in traditional medicines for relieving flatulence and migraine. Coriander has been used for centuries as a natural healing aid. It is said that coriander seeds were found in the Egyptian tomb of King Rameses II. In ayurvedic medicine, coriander is used as a digestive aid. In Chinese medicine, the whole herb of coriander was used to treat problems such as nausea, toothache, measles and piles. The Ancient Greeks were said to use coriander to assist in weight loss. Ancient Greek physicians also reputedly used coriander in healing and in the East, coriander has been used for its medicinal properties in chinese and ayurvedic medicine [7]. The leaf shape changes from strap-like to round to linear and divided as the plants grow. The pungent leaves and equally pungent fresh seeds change to a sweet spicy aroma in the dried seeds. These transformations convey much about the uses of the plant. The seed is almost serenely pleasant. The leaf is bitter in taste but, is warming and comforting. Seeds are incorporated into formulas to change mood, improve taste and promote a sense of well-being. In Ayurveda the fresh juice of the herb is used to treat people with allergies, hay fever and skin rashes and the seeds for digestive upsets and urinary infections or inflammation. The crushed and roasted seeds, infused in hot water are used to treat oral thrush. [7]

III. LEAVES AND TENDER STEM

The leaves are also known as cilantro. They are always used fresh. The leaves have a different taste from the seeds, with citrus overtones. Some perceive an unpleasant "soapy" taste or a rank smell and avoid the leaves. They feature in Spanish, Middle Eastern, Indian, Oriental and South American cookery. They are sprinkled like parsley on cooked dishes, minced or puréed in chutneys, sauces, soups and curries, especially bhuna. Both seeds and leaves can be used in salads. They are also Used in treatment of dyspepsia, flatulence & piles. The leaf improves digestion and assimilation particularly in those who do not digest food well or have chronic ill health. The leaves also increase diuresis [12]. The leaves of coriander can be used to make a tea mixed with other herbs such as fennel, caraway and aniseed. The tea of coriander helps aid flatulence and indigestion, breastfeeding mothers drink coriander tea to ease colic in

their babies. Coriander leaves and seeds are used extensively in cooking as both a spice and garnish, particularly in Middle Eastern cookery in curries. They combine well with yoghurt and lentil dishes [3]. The fresh leaves are an ingredient in many South Asian foods (particularly chutneys), in Chinese dishes and in Mexican salsas and guacamole. Chopped coriander leaves are a garnish on cooked dishes such as dal and curries. As heat diminishes their flavor quickly, coriander leaves are often used raw or added to the dish immediately before serving. In Indian and Central Asian recipes, coriander leaves are used in large amounts and cooked until the flavor diminishes. The leaves spoil quickly when removed from the plant, and lose their aroma when dried or frozen. Coriander leaves were formerly common in European cuisine. Today western Europeans usually eat coriander leaves only in dishes that originated in foreign cuisines, except in Portugal, where they are still an ingredient in traditional dishes. [8]

IV. CORIANDER FRUIT

The dry fruits are known as coriander seeds. The word coriander in food preparation may refer solely to these seeds (as a spice), rather than to the plant itself. The seeds have a lemony citrus flavour when crushed, due to terpenes, linalool and pinene. It is described as warm, nutty, spicy, and orange-flavored. Coriander seed is generally used coarsely ground or more finely powdered, depending on the texture desired. It is best bought whole as, being brittle, it is easy to mill or pound in a mortar. Ground coriander is apt to lose its flavour and aroma quickly and should be stored in an opaque airtight container. Whole seeds keep indefinitely. Their flavour may be enhanced by a light roasting before use. As coriander is mild, it is a spice to be used by the handful, rather than the pinch. Coriander seed is a spice, in garam masala and Indian curries, which often employ the ground fruits in generous amounts together with cumin. It acts as a thickener. Roasted coriander seeds, called dhana dal, are eaten as a snack. It is the main ingredient of the two south Indian dishes: sambhar and rasam. Coriander seeds are boiled with water and drunk as indigenous medicine for colds. Outside of Asia, coriander seed is used for pickling vegetables, and making sausages in Germany and South Africa. In Russia and Central Europe coriander seed is an occasional ingredient in rye bread as an alternative to caraway. Coriander seeds are used in brewing certain styles of beer, particularly some Belgian wheat beers. The coriander seeds are used with orange peel to add a citrus character. [8]

V. CORIANDER ROOTS

They have a deeper, more intense flavour than the leaves. They are used in a variety of Asian cuisines. They are commonly used In Thailand to flavour meats and curries [8].

VI. CORIANDER OIL

Fruits on distillation yield an essential oil called coriander oil. The fragrant odour and pleasant aromatic taste of coriander is because of this oil. Used in perfumery, soaps, candy, cocoa, chocolates, tobacco, meat products, beverages and to mask offensive odour in pharmaceutical preparations. The essential oil is also added to carbonated beverages. In western countries, used for flavouring liquors, especially gin. & variety of food stuffs. It is more stable & retains its odour for longer time as compared to other oils of its class. Decylaldehyde obtained by treating the oil with bisulphite is used for perfumery purposes. Commercial oil is extensively adulterated with sweet orange oil, cedar wood oil, turpentine & anethol or aniseed oil. Residue after extraction of volatile oil is used as fodder for animals. Also oil is used for seasoning for sausage and other meat products, baked food, condiments, chewing gums,

alcoholic/ non alcoholic beverages & also as an ingredient in curry mixes [12]. Because of the linalool content in essential oil, it is toxic against three stored rice pests *Sitophilus oryzae*, *Rhyzopertha dominica* and *Cryptolestes pusillus*. Coriander essential oil is used in aromatherapy for healing of digestive problems, including flatulence, indigestion and constipation, to eliminate toxins, to stimulate circulation, to ease migraine, to treat rheumatism and arthritis. Coriander essential oil is analgesic, stimulant, anti-bacterial, anti-infectious and carminative [7].

VII. CULINARY USES

The commonest use of coriander seed is in curry powders, where it is the bulkiest constituent, often rough ground in India to give a crunchy texture. The seeds can be likewise used in stews and soups. Coriander is an ingredient of garam masala, pickling spices and pudding spices and is used in cakes, breads and other baked foods. Sugared comfits made from the seeds are a traditional sweetmeat and breathe sweetener. Coriander is a characteristic of Arab cookery, being common with lamb, kid and meat stuffings. Taklia, a popular Arab spice mixture, is coriander and garlic crushed and fried. Coriander with cumin is a common combination and features in falafel and in the Egyptian appetizer dukka, which consists of those spices plus sesame seeds, hazelnuts, salt and pepper, roasted and crushed. Coriander goes well with ham and pork, especially when orange is included. It enhances fish dishes and, with other spices, may form a delicious coating for spiced fish or chicken, rubbed into the scored flesh and grilled. Frying coriander seeds with sausage adds an unusual flavour. Coriander complements chilli and is included in many chilli recipes, such as harissa, the hot North African red pepper sauce. It may be added to cream or cottage cheese. They are extensively employed as a condiment in curry powders, used for flavouring salads, puddings, chocolates, gelatine – desert, fish, meat, etc. Used for flavouring liquors particularly gin. It is used in the Belgian wheat beer, witbier. Coriander seeds are added partly to leaven and partly to the dough, or the spice is sprinkled on the bread. Loss of spice aroma occurs during dough handling and baking. It is recommended that ground spices be used, and added directly to the dough during mixing in the following amounts: 0.4% coriander seed and 0.3% aniseed (flour wt. basis) [10]. The fruits are often candied in sugar syrup and sold as sugar plums. They are mixed with rice in preparing yeast. The seeds present inside the thin fruit wall are chewed along with betel leaves to correct foul breath. The coriander seeds are processed into cotyledons- dal, which are toasted and salted to produce the supari dal, used as an adjunct in supari, a mouth freshener & also eaten as a flavoured digestive chew.

VIII. MEDICINAL AND PHARMACOLOGICAL USES

The fruits including seeds are stimulant, pectoral, antipyretic & anthelmintic. An infusion of fruits is useful in flatulence, indigestion, vomiting & other intestinal disorders. It is also used in bleeding piles, rheumatism, neuralgia, cephalgia, & in eye infection. In intestinal disorders, infusion of fruits is given in combination with cardamom and caraway seeds. Fruits are given in rheumatic fever. Also used as an ingredient in many ayurvedic medicines prescribed for curing indigestion, diarrhoea, dysentery and urinary troubles. Aqueous extract of roasted seed contain large amounts of acetylcholine & precursor choline and is reported to show cholinomimetic effects on rat blood pressure, rat jejunum and frog rectus abdominis preparations. Dried seeds are reported to possess diuretic and aphrodisiac properties. The plant forms one of the ingredients of a Pakistani herbal drug INTELLAN, which is considered to be a neuroenergizer [12]. It is found that Coriander has 20 chemicals with anti-bacterial action (2.2% on dry weight). It is fungicidal and a muscle relaxant. As a free radical scavenger Coriander seed oil and its

fractions exhibit the strong Radical Scavenging Activity compared. Recently it is found that it is used as a chelation treatment for Mercury deposits. Mercury deposits which commonly occur when people have their amalgams removed. These are found to be successfully eliminated by the oral intake of 100mg tablet of Coriander 4 times daily for 3 weeks during and after the removal. Studies also show that Coriander has an effect on both blood sugar levels and blood lipid levels of animals [3]. Coriander seed oil is an aromatic stimulant, a carminative (remedial in flatulence), an appetizer and a digestant stimulating the stomach and intestines. It is generally beneficial to the nervous system. Its main use is in masking foul medicines, especially purgatives, where it has anti-gripping qualities. In Asia the herb is used against piles, headache and swellings, the fruit in colic, piles and conjunctivitis, the essential oil in colic, rheumatism and neuralgia, the seeds as a paste for mouth ulceration and a poultice for other ulcers. Recently it is found to be used as a stomach soother for both adults and colicky babies. Coriander contains an antioxidant that helps prevent animal fats from turning rancid. It also contains substances that kill meat-spoiling bacteria and fungi. These same substances in Cilantro also prevent infection in wounds. Coriander has been shown to improve tummy troubles of all kinds, from indigestion to flatulence to diarrhoea. Weak Coriander tea may be given to children under age 2 for colic. It's safe for infants and may relieve their pain and help you get some much-needed sleep. Cilantro and Coriander contain substances that kill certain bacteria and fungi, thereby preventing infections from developing in wounds. Sprinkle some coriander Seed on minor cuts and scrapes after thoroughly washing the injured area with soap and water. Intriguing new studies suggest that coriander has anti-inflammatory effects. Since the pain of arthritis is caused by inflammation coriander oil can relieve the pain. [5]. Coriander tea is recommended for patients suffering from kidney problems. For preparing coriander tea, coriander seeds are allowed to boil in water for a few minutes and the decoction is taken as a medicine. Coriander tea also helps to cure mouth ulcers and swellings. Regular intake of coriander tea also helps to lower the blood cholesterol levels. In case of Diarrhoea, coriander seeds are soaked in water overnight and then taken along with buttermilk early in the morning. The juice of coriander is also used as an ayurvedic medicine for treating nausea, and morning sickness. It is also used in the treatment of colitis and some of the liver disorders. Coriander seeds also help to reduce acid peptic disease and it is also used as ayurvedic medicine in the treatment of Dysentery. Coriander seeds also help to reduce body fever by inducing urination. Coriander is used along with other herbs such as dry ginger, helps to relieve respiratory tract infections and cough. Some of the ayurvedic medicines also use coriander in the treatment of Typhoid fevers and in the treatment of menorrhagia, which is profuse bleeding during menses. The decoction of coriander seeds is used for this treatment. A mild decoction of coriander seed is also used as eyewash to reduce irritation and burning sensation [16].

IX. THERAPEUTIC USES

A. Internal use

- The herb has great success in treating loss of appetite and other dyspeptic complaints. When used in laxatives, it eases griping.
- The roots, leaves and leafstalks can be used to flavour soups, salads, beans and curries.
- Dried stems are used for smoking foods.
- The seeds (dried ripe fruits) are used as an ingredient of curry powders, pickles, pickling spice, baked foods, sausages and sauces.
- Chewing the seeds after eating garlic is used to freshen the breath.

B. External use

- Coriander is included in lotions and ointment to treat piles (hemorrhoids), rheumatism, menstrual disorders and painful joints.
- Historically, the fruits have been used to treat wounds and burns and the herb has antimicrobial properties.

C. Aromatherapy and essential oil use

- Coriander essential oil can help improve memory and has a positive effect on the digestive system. It is helpful with arthritis and rheumatism.
- It helps to detoxify the body and to stimulate the spleen. It is indicated as being connected to Prana - the life-giving spark of life.
- It has a hormone balancing effect and helps with menstrual problems.
- It is not normally used in skin care products, but toiletry items often use it as fragrance.
- It has analgesic, anti-spasmodic, carminative, deodorant, stimulant and stomachic properties. [17]

X. MEDICINAL PROPERTIES OF CORIANDER**A. Hypolipidemic effect**

Coriander seeds had a profound influence on the metabolism of lipids. It leads to a significant decrease in cholesterol and triglyceride levels. The key enzyme in the pathway of cholesterol metabolism in liver is HMG CoA reductase, a microsomal enzyme. It is studied that coriander seeds increases its activity. Also it causes increased hepatic degradation of cholesterol. Coriander seeds cause a decrease in LDL + VLDL cholesterol. Also more of the newly synthesized cholesterol is channelled for the synthesis of bile acids. High density lipoproteins (HDL) and plasma LCAT are involved in the transport of cholesterol from extrahepatic tissues to the liver for its excretion. The higher levels of cholesterol associated with HDL and the increase in the activity of plasma LCAT due to coriander seeds results in a higher amount of cholesterol being removed from extra hepatic tissues which may contribute to the hypocholesterolemia observed in these animals. Hence the lowering in cholesterol levels of serum and tissues by the administration of this spice would seem to be mediated through its increased rate of degradation to bile acids and neutral sterols. Thus, inclusion of coriander seeds in the diet shows significant hypolipidemic effects. [14]

B. Antibacterial activity

Coriander produces a powerful antibiotic. It is found that a compound, dodecenal found in both the seeds and leaves of the coriander plant is twice as potent as the antibiotic gentamicin against Salmonella. The compound is one of several antibiotic agents found in the plant, but it is far and away the most powerful. This compound could help in the war against antibiotic resistance. It appears to eradicate its pathogen target by rupturing bacterial cell membranes in much the same way as a detergent. (Bea Perks, 2004). Coriander juice is known to inhibit growth of Escherichia coli and Staphyococcus aureus, and it has been found that the aldehydes in fresh coriander leaves have antibacterial activity against Salmonella choleraesuis, one of the most common causes of food-borne bacterial illnesses. The greatest activity is shown by trans-2-dodecenal. Its higher activity over compounds such as trans-2-hexenal correlates with its

increased hydrophobicity and consequential non-ionic surfactant properties, e.g. its ability to break bacterial cell wall membranes. [11]. The essential oil shows high degree of inhibition against many microorganisms such as *Listeria monocytogenes*, *Staphylococcus aureus*, *Escherichia coli*, *Yersinia enterocolitica*, *Pseudomonas aeruginosa*, *Lactobacillus plantarum*, *Aspergillus niger*, *Geotrichum*, *Rhodotorula*, *Curvularia palliscens*, *Fusarium oxysporum*, *Fusarium moniliforme* and *Aspergillus terreus*. The oleoresin shows more than 50% mycelial zone inhibition for the fungi *Fusarium oxysporum*, *Aspergillus niger* and *Aspergillus terreus*. The essential oil shows 100% inhibition on the growth of *A.terreus*, *A.niger*, *F.graminearum* and *F. oxysporum*, whereas its oleoresin shows weaker fungitoxic activity, exhibiting 100% inhibition on the growth of *F. oxysporum* only [6].

C. Antiplatelet activity

Thrombosis, an important event in cardiovascular diseases, can be fatal if platelet aggregation takes place in the narrowed lumen of arteries, causing an impairment of blood flow to the heart. It is studied that coriander extracts inhibit human platelet aggregation. Calcium ions are known to play an important role in platelet aggregation. A rise in the cytosolic calcium levels accompanies the activation of platelets through the stimulation of enzymes, which are not fully functional at low levels of calcium present as in resting platelets. Drugs that are calcium antagonists usually do not bind to specific sites but may cause the thickening of platelet membranes due to the insertion of these drugs into platelet membrane bilayers, thus affecting the calcium mobilization. The inhibition of human platelet aggregation by coriander leaf extracts may be due to the interaction of component(s) of the extracts with the membrane bilayers, causing the thickening of membranes and thus affecting calcium mobilization. This may, in turn, effectively block the pathways of platelet aggregation due to the lack of stimulation of enzymes required for platelet aggregation. It may also be likely that they prevent ADP from inhibiting the increase in intraplatelet c-AMP levels and adenylate cyclase stimulation as well as possibly inhibit collagen-induced aggregation by blocking the release of hydrogen peroxide, which will otherwise stimulate arachidonic acid metabolism [15].

D. Immunodulatory property

Coriander provides many dietary phytonutrient including immunomodulatory nutrients of vitamins, and they also contain a variety of phytochemicals of unknown function. Its constituents, namely chlorogenic acid, ferulic acid, p-coumaric acid and caffeic acid, enhance the activity of human lymphocyte proliferation and secretion of IFN- γ . In addition, it also contains several bioactive phytochemicals including flavonoids (quercetin, rutin) and coumarins (bergapten, isopimpinellin, xanthotoxin), which are reported to have the efficacy against infections. These are also anti-allergy, anti-inflammatory and immunosuppressive. IFN- γ is produced by T lymphocytes, natural killer cells, macrophages and neutrophils and has receptors on virtually all cell types of the body. It is a hallmark of Th1-type response and exerts a multitude of cellular biological effects. Thus, high-level production of IFN- γ is typically associated with effective host defence against intracellular pathogens and cancer. It is proved that coriander extract significantly stimulate the proliferation of human PBMC and/or the secretion of IFN- γ . The immunostimulating activity may probably due partly to the phenolic compounds such as chlorogenic acid, caffeic acid, ferulic acid and p-coumaric acid, which have been shown to possess this activity, however, studies show that flavonoid quercetin and coumarin isopimpinellin might also contribute to the immuno-enhancing activity of lymphocyte activation, whereas flavonoids (quercetin and rutin) and coumarins (bergapten, xanthotoxin) might also serve as candidates for the immuno-stimulating activity of IFN- γ secretion [9].

E. Antidiabetic action

Coriander has been documented as a traditional treatment of diabetes. It is found that its extract reduces hyperglycaemia, and increases 2-deoxyglucose transport (1×6-fold), glucose oxidation (1×4-fold) and incorporation of glucose into glycogen (1×7-fold) of isolated murine abdominal muscle which is comparable with 10-8M-insulin. It also evokes a stepwise 1×3–5×7-fold stimulation of insulin secretion from a clonal B-cell line. Activity of the extract is found to be heat stable, acetone soluble and unaltered by overnight exposure to acid (0×1M-HCl) or dialysis to remove components with molecular mass, 2000 Da. But the activity is reduced by overnight exposure to alkali (0×1M-NaOH). Sequential extraction with solvents reveals insulin-releasing activity in hexane and water fractions. These results demonstrate the presence of natural components in coriander which exhibit antihyperglycaemic, insulin-releasing and insulin-like activity in *Coriandrum sativum*. The mode of action of coriander differs significantly from that of the established antihyperglycaemic drug, metformin which exerts effects on glucose transport via insulin-mediated peripheral glucose uptake [1].

F. Antioxidant activity

Coriander leaves show greater antioxidant activity than seeds. The antioxidant property is mainly contributed by ethyl acetate. Petroleum ether soluble fraction of coriander at a concentration of 0.10% is found to be antioxidative. Phenolic compounds such as, caffeic acid, protocatechinic acid and glycitin are among the principal components responsible for the antioxidant activity of the aqueous coriander extract [4]. The bioactive compounds present in aqueous and etheric coriander extracts exert a protective effect against lipid peroxidation, reversing this alteration during the ageing process. Aqueous and etheric coriander extracts are composed of phenolics and carotenoids which exhibit a considerable antioxidant action. These antioxidants protect from free radicals and oxidising compounds. The effectiveness of these extracts improved with prolonged and continued duration of use. The etheric extract is more effective in reducing oxidation [4].

G. Chelation effect

Cilantro detoxifies mercury from neural tissue. It is a novel technique, which greatly increases our ability to clear up recurring infections, both viral and bacterial. Bioactive Cilantro blend is an inexpensive, easy way to remove (or chelate) toxic metals from the nervous system and body tissues. Cilantro blend contains yellow dock to help drain the mercury from the connective tissues. It is an excellent blood cleanser, tonic, and builder, working through increasing the ability of the liver and related organs to strain and purify the blood and lymph system. It achieves its tonic properties through the astringent purification of the blood supply to the glands and acts as a cleansing herb for the lymphatic system [18].

XI. CORIANDER PRODUCTS

Coriander is sold as fresh coriander leaves, dried fruits called as coriander seeds, coriander powder, oleoresins, coriander seed oil, etc.

A. Volatile oil

It is primarily recovered from dried ripe seeds. To produce the oil, dried seeds are placed in stainless steel distillation vessels equipped with steam inlet, vapour outlet, condenser & separate assembly. Live steam is introduced below the charge. Steam rising through the plant charge carries whole volatile oil. Volatile oil is condensed & separated from water. Advantage of using essential oil is that it has uniform flavour quality, free from enzymes, tannins & does not impart colour to end product.

B. Oleoresin

It represents complete resinous fraction (non volatile) & flavour fraction present in spices. It is the true essence of coriander obtained by solvent extraction of ground seeds & is brownish yellow liquid with a fruity, aromatic, slightly balsamic flavour.

C. Coriander powder

Ground spice can be incorporated into food dishes more uniformly than whole spices. They have limited shelf life & are subject to oxidation, flavour loss and degradation on long storage owing to microbial contamination.

XII. CONCLUSIONS

Coriander, the important and commonly used spice has a long tradition in its applications in food as well as medicine. The dried coriander fruits are usually powdered and forms the major ingredient in many of the Spice mixes. The extract of the coriander individually or in combination with other spices finds potential therapeutic applications. Various parts of coriander are being used for its potential applications. The fresh leaves find applications in many food preparations, particularly in garnishing wherein it imparts a characteristic flavour. The leaves along with its tender stem also find applications in south Indian preparations like Sambar and Rasam. In addition, the roots have the potential for the use in various traditional medicines, perfumery, soaps, candy, cocoa, chocolates, tobacco, meat products, and beverages and to mask offensive odour in pharmaceutical preparations. The essential oil is also added to carbonated beverages. In western countries, used for flavouring liquors, especially gin & variety of food stuffs. Coriander essential oil is used in aromatherapy for healing digestive problems, including flatulence, indigestion and constipation, to eliminate toxins, to stimulate circulation, to ease migraine and to treat rheumatism and arthritis. Coriander essential oil reportedly possesses analgesic, stimulant, anti-bacterial, anti-infectious and carminative properties. The reports also show that processed coriander fruits find a number of medicinal and pharmacological applications such as hypolipidemic, antibacterial, antiplatelet, immunomodulatory, antidiabetic and antioxidant properties. Presently, the coriander fruits are extensively used in its powdered form, in addition to the Oleoresin and essential oil which finds application in value added products.

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