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Chapter

Health Benefits and Functional and Medicinal Properties of Some Common Indian Spices

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Abstract

India is the largest producer and consumer of some important common spices. Major Indian spices include pepper, cardamom, ginger, turmeric and chilies. Commercial cultivation in India is undertaken on 27 spices besides the herbal spices. Spices and herbs are mostly used as seasonings to impart flavors, pungency, aroma and color in the food. In addition, spices enhances shelf life of the food by preventing and delaying the spoilage and by preserving the sensory attributes of food products. Spices contain several important phytochemicals like aromatic compounds, essential oils, phenolics and pigments which imparts characteristic flavor and aroma and gives a herbal appeal to the food and beverages and enhances their consumer acceptability. In addition the active components of these herbs and spices are endowed with tremendous functional properties and medicinal values providing several health benefits and immunity. The era of Covid-19 has seen spiked consumption of spices and herbs based health drinks and concoctions for providing these health benefits and immunity. The present chapter deals with the characteristics of some important Indian spices, their usages, active components present in them along with exploring their health benefits, functional and immunomodulant properties.

Keywords: Indian spices, herbal food products, functional foods, seasonings, phytochemicals, bioactive components

1. Introduction

India has been famous for varieties of spices since the ancient time for its exotic flavor, taste and medicinal values, therefore known as the home of Spices [1]. Spices means whole or ground form obtained from natural plants or vegetable products which has been used for imparting flavor, aroma and pungency to foods and also used for seasoning of foods. It also has non-food applications in dyeing, perfumery products and neutraceutical industries. It mask the spoiled flavor of meat that enhance the shelf life of foods [2]. Different parts of the plants or tree are used as spices such as fruits, stigma, bark, seeds, leaves, kernel, aril, bulbs, berries etc.

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Around the world about more than 70 types of spices are grown, whereas pepper, cardamom, ginger, turmeric and chillies are the most common spices widely grown in India. However India is the largest producer as well as consumer of spices. Commercial cultivation in India is undertaken on 27 spices besides the herbal spices. The most famous spices of India is black pepper, which is known as the king of spices. Kerala got first position in the production of black pepper with contributing about 97% of the total production however cardamom known as the queen of spices which has been also used as essential commodity in the world. The leading spice producing states in India are the Andhra Pradesh, Karnataka, Kerala, Gujarat, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal. Spices are mostly used as flavoring agent in a number of foodstuffs like curries, bakery products, pickles, processed meat, beverages, liqueurs etc. They enhance or change the flavors of the foods. These herbs and spices endowed with tremendous functional properties and medicinal values provide great health benefits and immunity [3, 4].

2. Classification of spices

Indian spices can be categorized based on its plant parts used, origin and flavor and economic importance. The classification is further given as hereunder.

2.1 Based on its plant parts

It is categorized based on its leaf, root, bulb, fruit, rhizome, bark, seed, pod, Kernel, bud, floral parts, latex, berry and aril. Classification is given as follows:

- Seed: Cumin, black cumin, fenugreek, coriander, fennel, ajwain, poppy, aniseed and mustard.
- Bulb: Onion, garlic, leek and shallot.
- Bark: Cinnamon and cassia
- Fruit: Chili, cardamom, allspice and kokum
- Leaf: Mint, curry-leaf, bay-leaf, chive, rosemary and savory
- Rhizome: Turmeric, ginger, and galangal
- Pod: Vanilla and tamarind
- Kernel: Nutmeg
- Floral part: Saffron, savory, caper and marjoram
- Bud: Clove and caper
- Latex: Asafoetida
- Aril: Mace and anardana
- Berry: Black pepper, juniper and allspice

2.2 Based on origin and flavor

Based on the origin and flavor spices can be classified as aromatic spices, pungent spices, phenolic spices and colored spices. Classification is given as follows:

- Pungent spices: Ginger, chili, black pepper and mustard
- Phenolic spices: Clove and allspice
- Aromatic spices: Cardamom, aniseed, celery, cumin, coriander, fenugreek and
- cinnamon.
- Colored spices: Turmeric, saffron and paprika

2.3 Based on economic importance

Based on economic importance Indian spices divided into two groups i.e. major and minor spices.

2.3.1 Major spices

Major spices are contributing a principle share in spice trade industry globally and contribute about 75–90% of the total imported exchange. Small cardamom, black pepper, chili, turmeric and ginger are comes under major spices.

2.3.2 Minor spices

Apart from five major spices, all other are known as minor spices. They are further divided into five sub groups. They are stated as follows:

- Bulbous spices: Garlic, onion, leek and shallot
- Seed spices: Coriander, cumin, black cumin, fennel, aniseed, celery, mustard, poppy and caraway.
- Aromatic spices: Clove, cinnamon, allspice, aniseed and nutmeg
- Leafy spices: Curry leaf, mint, rosemary, bay-leaf, and parsley.
- Acidulant tree spices: Tamarind, kokum and anardana

3. Common Indian spices

Common Indian spices, parts used and active compounds present in them are listed in **Table 1** and their usage and health benefits are presented in **Table 2** and discussed in this section.

3.1 Chilies (Mirch)

Red chili is the frequently used spice in our daily life which belongs of genus Capsicum, that is most famous consumed spices all around the world [5]. Chillies

Spices Name	Scientific Name	Plant part use as spice	Active compounds
Ginger	*Zingiber officinale* Rosc.	Rhizome	Gingerol and shogaol
Turmeric	*Curcuma longa* L.	Rhizome	Curcumin
Coriander	*Coriandrum sativum* L.	Leaf & Fruit	Geraniol
Cumin	*Cuminum cyminum* L.	Fruit	Aldehyde cumino
Cardamom (small)	*Elettaria cardamomum* Maton	Fruit,Seed	Cineole, pinene, sabinene and porneol
Cardamom (Large)	*Amomum subulatum* Roxb.	Fruit,Seed	Cineole, pinene, sabinene and porneol
Chili	*Capsicum annuum* L.	Fruit	Capsaicin
Fenugreek	*Trigonella foenum-graecum* L.	Seed	Rhaponticin and isovitexin
Aniseed	*Pimpinella anisum* L.	Fruit	Anethole
Ajwain	*Trachyspermum ammi* L.	Fruit	Thymol
Caraway	*Carum carvi* L.	Fruit	D-carvone and D-limonere
Cinnamon	*Cinnamomum zeylanicum Breyn*	Bark	Eugenol, cineole and cinnamaldehyde
Garlic	*Allium sativum* L.	Bulb	Allicin
Kokam	*Garcinia indica* Choisy	Rind	Anthocyanin
Saffron	*Crocus sativus* L.	Stigma	Crocin and crocerin
Pepper	*Piper longum* L.	Fruit Long	Peperine
Clove	*Syzygium aromaticum(L)* Merr.& Perry	Unopened Flower bud	Eugeniol
Asafoetida	*Ferula asafoetida* L	Root & Rhizome	Ferulic ester
Bay Leaf	*Laurus nobilis* L.	Leaf	Eugenol, methyl eugenol and elemicin
Nutmeg & Mace	*Myristica fragrans* Houtt.	Seed	Myristicin
Poppy seed	*Papaver somniferum* L.	Seed	Thiamin, folate,
Allspice	*Pimenta dioica* (L) Merr.	Fruit & Leaf	Eugenol
Rosemary	*Rosmarinus officinalis* L.	Leaf	Carnosic acid
Sage	*Salvia officinalis* L.	Leaf	Rosmarinic Acid
Oregano	*Origanum vulgare* L.	Leaf	Carvacrol and thymol
Tamarind	*Tamarindus indica* L.	Fruit	Limonene, geraniol, safrole and cinnamic acid
Rosemary	*Rosmarinus officinalis* L.	Leaf	Rosmarinic acid, carnosol, and carnosic acid
Capsicum	*Capsicum annuum* L.	Fruit	Capsaicin
Paprika	*Capsicum annuum* L.	Fruit	Capsaicin
Celery	*Apium graveolens* L.	Fruit & Stem	Umbelliferone and Alpha-linoleic acid
Dill	*Anethum graveolens* L.	Fruit	Limonene
Cassia	*Cinnamomum cassia.*Blume	Bark	Cinnamaldehyde
Mustard	*Brassica juncea* L.Czern	Seed	Allyl isothiocyanate
Parsley	*Petroselinum crispum* Mill.	Leaf	Myristicin & limonene

Spices Name	Scientific Name	Plant part use as spice	Active compounds
Star Anise	*Illicium verum* Hook.	Fruit	Shikimic acid
Sweet flag	*Acorus calamus* L.	Rhizome	Asarones
Greater Galanga	*Alpinia galanga* Willd.	Rhizome	1′-ace-toxychavicol acetate
Horse Radish	*Armoracia rusticana* Gaertn.	Root	Allyl isothiocyanate
Vanilla	*Vanilla planifolia* Andr.	Pod	Vanillin

Table 1.
List of common spices used in India, parts used and active compounds present in them.

are having differnet size, shapes and color. The red color of chillies is due to presence of capsanthin apart form a carotenoid pigment. The pungency of chillies is due to the presence of alkaloid capsaicin which is measured in terms of scoville value. Capsicum oleoresin of red chili is used for ointments, which are used to get relief from pain, swelling and inflammation [6, 7]. Generally smaller the size more is the pungency. Ground chili is used in most of the Indian gravies and vegetable dishes. It is also used in day to day preparation foods like chutney, sauses, pickles, dehydrated chili etc.

3.1.1 Uses and health benefits

- It is used as food seasoning agent.
- It is a stimulant of ptyalin present in saliva which helps in digestion.
- A green chili is rich in Vitamin C & vitamin A.
- It is carminative and antiflatulence agent.
- It stimulates blood circulation.
- It is good for sore throat.

3.2 Turmeric (Haldi)

Turmeric grown in India includes 60% of the overall area uses for spices and condiments belong to the Zingiberaceae family which is commonly cultivated in India and Southeast Asia. It is known by different names such as kunyit (Indonesian and Malay), besar (Nepali) and haldi or pasupu in some Asian nations. There are about 70 species of turmeric of which 30 species are found in India. Turmeric obtained from the rhizome of Curcuma longa plant which accounts 96% of the total turmeric obtained from this variety in India [8], however, *Curcuma aromatica* is another variety of turmeric which is accounts 4% of the area under cultivation. Turmeric rhizome contains 5% essential oil and the coloring substance present in it is known as curcumin which has been used as medicine since the many years ago because it having several pharmacological properties like anti-inflammatory, anti-neoplastic, and anti-angiogenic. It is "Generally Recognized as Safe." By Food Drug Administration (FDA), and consumption of 12 g/day of curcumin was safe without any toxic effect [9]. It is used ground in curry powder, meat and egg dishes, in pickles and as a coloring substance in cakes and rice. It is also used in lemon rice,

	Spices	Uses	Benefits	Picture of spices
	Cardamom	It is commonly used in sweets and pharmaceutical sector as a flavor and smell enhancer.	It is widely used in stomach disorder and problems of respiratory system. Chewing of whole cardamom is also good for coping with diabetes.	
	Chili	Chili is a principle ingredient adding to the food for hot flavor.	It reduces the cholesterol and also helps in burning calories. A green chili is rich in Vitamin C & vitamin A.	
	Cinnamon	It is used for mainly for preparing masalas and seasoning food.	It reduces blood cholesterol with natural production of insulin.	
	Coriander	Its leaves and seeds are used in cooking. The oil of coriander is used as antimicrobial property and as a natural fragrance in perfumery industry.	It is used in allergies, poor digestion, aching joints and rheumatism.	
	Clove	Clove is highly valued medicine for their carminative, stimulant, antiflatulent and antihelmenthic properties.	It is mostly used in many households as an aid to prevent the minor disorders like indigestion, flatulence, tooth ache etc.	
	Fenugreek	It is mainly used as a green leafy vegetable and seeds are used for seasoning and preparing *Masalas*. It also has medicinal uses.	Fenugreek seed tea or sweet fudge is good for increasing breast milk. It also helpful for treating diabetes and lowering cholesterol	
	Garlic	It is use as condiment for flavoring of dishes.	It is used to treat various digestive disorders. Allicin uses intestinal synthesis of vitamin B.	

Spices	Uses	Benefits	Picture of spices
Ginger	Ginger oleoresin used for flavoring soft drinks and in medicine. Ginger Tea, ginger concoction effective in Cold & coughs.	It is used as carminative and gastro intestinal stimulant. It reduces opacity of cornea.	
Turmeric	Used as blood purifier & antibiotics. It is also used in cooking and skin care products.	Turmeric powder can be used for healing cuts and wounds. It is used as anti-oxidant due to presence of phenolic bioactive compound of curcuminoids	
Black Pepper	It is mainly used in cooking, particularly for garnishing.	It is used effectively in the treatment of rheumatism and muscular pain, intestinal gas and headache.	
Cumin	It is used for cooking and it also possesses medicinal properties.	It is a good source or iron and keeps immune system healthy. Water boiled with cumin seeds is good for coping with dysentery.	
Ajwain	Even a small number of fruits tend to dominate the flavor of a dish.	Ajwain is used in traditional Ayurvedic medicine primarily for stomach disorders such as indigestion, flatulence diarrhea and colic	
Aniseed	It is used a mouth refresher and used after the taking meals. It is also used in preparation of cakes, bread, cookies, and non-vegetarian dishes.	It is mildly carminative and used in treating colic pain.	
Caraway	Its seeds are used to flavor the cakes, biscuits, cheese, apple sause and cookies.	The combination of black cumin and caraway seeds oils have been used to killed parasites and worms, detoxify, ameliorate amoebic dysentery, shigellosis, abscesses, old tumors, ulcers of the mouth, and rhinitis.	

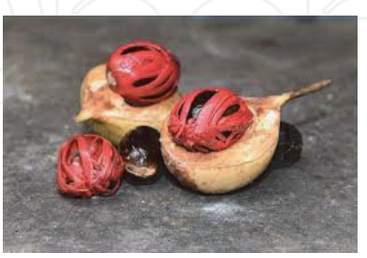
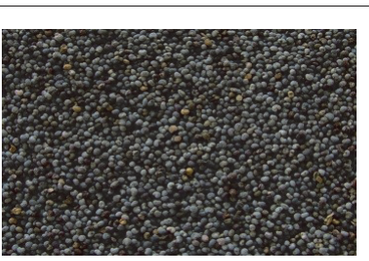
Spices	Uses	Benefits	Picture of spices
Kokum	Its colorful red juice is used for the manufacture of beverages	In traditional medicine, such as Ayurveda, kokum is prescribed for edema, rheumatism, delayed menstruation, constipation and other bowel complaints, and intestinal parasites	
Saffron	It is used for cooking as well as in beauty products. It is mainly used in sweet dishes. It has good medicinal properties.	It helps to cope with skin diseases. It is a good remedy for cough, cold and asthma.	
Asafoetida	It is used for seasoning food especially snacks and has medicinal uses.	A good medicine for whooping cough and stomach ache caused due to gas.	
Bay leaf	It is used in cooking to add a specific flavor to food. It also has some medicinal properties.	Its oil possesses antifungal and anti bacterial.	
Nutmeg & Mace	It is used in powdered form for garnishing and also for masala preparation. It is used in soaps, perfumes and shampoos.	It is beneficial for the treatments of asthma, heart disorder and foul breath.	
Poppy seed	Its seeds are good source of thiamin, folate, and important minerals like calcium, iron, magnesium, manganese, phosphorus and zinc.	It also effective in paralysis, facial palsy, migraine, amnesia related problem. Its powder if taken with water is effective in treating hemorrhoids	

Table 2.
Uses and benefits of some common Indian spices.

sambar, dal, kadhi, and khichdi and in marinating meat. The most common adulteration in turmeric is metanil yellow or lead salts. India is the largest producer as well as exporter of Turmeric spice to the USA, U.K and Japan. Curcuminoids are responsible for yellow color and present 2–4% in turmeric.

3.2.1 Uses and health benefits

- It is used as anti-oxidant due to presence of phenolic bioactive compound of curcuminoids.
- Generally used for flavoring & coloring food.
- Principal using in manufacture of curry powders.
- Turmeric oleoresin is used instead of powder in pickles, gelatin, butter & cheese.
- Essential oil of turmeric is antimicrobial, antiseptic & antibacterial (due to sodium salts of curcumin & curcuminoids.
- Used as blood purifier & antibiotics.

3.3 Cardamom (Elaichi)

The common name of cardamom is Ellettaria cardamomum belong to the family Zingiberaceae and popularly known as the Queen of spice. The cardamom contains 2–10% volatile oil with the characteristic pleasant odor. The active compounds present in the oil cineole, terpinyl acetate, pinene, sabinene and porneol. It is used in coffee, sweet preparation, cookies, breads, cakes and preserves as flavoring substances. Cardamom is sometimes sold in the market after the extraction of essential oil. All species of cardamom are used as kitchen cooking spices. Besides the above uses it can be also helpful in flatulent indigestion and to stimulate the urge for food in humans with anorexia [10, 11].

3.3.1 Uses and health benefits

- Green cardamom is an essential ingredient in Indian sweets, puddings, yogurt and ice creams.
- Whole form important in chai masala, a special hot tea beverage.
- Aid in digestion, prevents nausea and vomiting.

3.4 Garlic (Lassan)

Garlic (Allium sativum L.) belongs to the family Liliaceae is native to Asia however it is also grown China, North Africa (Egypt), Europe, and Mexico. Its bulb growing to 25–70 cm height with flowers, which is used for flavoring of varieties of foods to enhance the taste, nutritive value and digestion. The principle compound present in the garlic is allin (inactive form) which is converted to allicin (active form) by the enzyme allinase which has been recognized for antifungal and antiviral activities. Allicin further converted in to allyl disulphide which is responsible for pleasant flavor [12]. It is used in recipe like rasam, chutney, pulav, sauses,

and most of the non-vegetarian dishes. A numbers of pharmacological activities are found in garlic like anthelmintics, anti-inflammatory, antioxidant, and antifungal with low side effects. (Alam, Hoq, & Uddin, 2016).

3.4.1 Uses and health benefits

- It is used to treat various digestive disorders.
- It is possess platelet aggregation inhibitor factor.
- Use as condiment for flavoring of dishes.
- Garlic oil is used as an insecticide.
- Garlic has antibacterial property (allyl disulfide oxide) against gram positive and gram negative bacteria.
- Allicin uses intestinal synthesis of vitamin B.
- Extract of the garlic can lower the serum cholesterol levels and prevent heart diseases

3.5 Ginger (Adrak)

It is the root of the plant Zingiber officinale Roscoe. Bioactive compounds present in the ginger are gingerol and shogaol. It has the pungency like lemony or camphory note. The flavoring compound has sharp burning sensory stimulation [13]. The pungency of dried ginger is more and valuable for the taste. Whole root is used for curries, pickles, chutney, preserve and dried fruits. Ground ginger is used in masala, pulav, pongal, all non-vegetarian foods. It is also used different beverages such as tea, lime juice and butter milk. It is used as appetizer, laxative, Indigestion, Asthma, Bronchitis [14, 15].

3.5.1 Uses and health benefits

- It is used as carminative and gastro intestinal stimulant.
- Ginger oleoresin used for flavoring soft drinks and in medicine.
- Ginger provides relief in piles, Rheumatism and Head ache.
- It reduces opacity of cornea.
- Fresh ginger juice is useful for diabetics.
- Ginger Tea, ginger concoction effective in Cold & coughs.
- It's improves the blood supply and heart muscles.

3.6 Coriander (Dhania)

Coriandrum sativum L. (Umbelliferae) is native of Meditarian region. It is mainly known for its fresh characteristic spring like aroma. The coriander seed

contains 0.5 to 1.0% essential oil which possesses an active compound geraniol. Coriander leaves are rich in vitamin C (250 mg/100 g), and vitamin A (5,200 IU/100 g). The roasted and ground coriander is used in curry powder as an ingredient. It is used as thickening and flavoring agent in the cookery. Coriander is used to make pastries, synthetic syrup and drinks. It also acts as preservative in meat preparation. Previously coriander is used to effective in digestive problem, respiratory and urinary systems [16, 17].

3.6.1 Uses and health benefits

Seeds are chewed to correct the foul breath.

- An infusion of seeds is useful for flatulence, indigestion, vomiting & intestinal disorders eliminating symptoms related to female reproductive parts.
- Oleoresin (5%) used in flavoring beverages, pickles, sweets & other delicacies.
- Coriander is used for urethritis, cystitis, urinary tract infection, urticaria, rash, burns, sore throat, vomiting, indigestion, nosebleed, cough, allergies, hay fever, dizziness and amebic dysentery.
- The oil of coriander is used as antimicrobial property and as a natural fragrance in perfumery industry.

3.7 Clove (Laung)

It is the small reddish flower bud of the tree Syzygium aromaticum of the family Myrtaceae. Indonesia is the famous for cloves flower buds which is used around the world in cuisine [18]. In India it is grown in Nilgiris, Tembasi hills and Kanyakumari district in Tamilnadu state and Kottayam and Quilon districts in Kerala. The major component of the essential oil is Eugeniol and oil content about 15%. The oil of clove is frequently used in Ayurveda and Chinese medicine as a painkiller in dental problems [19]. Eugeniol present in the clove have antioxidant properties which retard the foods from get rancid. Eugenol esters are used as flavoring agent. Presence of strong and hot pungent taste, cloves is used as flavoring and dietary additives in meats and bakery products specially. We can blend the flavor of clove with both sweet and savory dishes. Due to its antioxidant properties it is act as preservative. It is popularly used in pan masala, betel nuts and chewing gums. A number of actions reported in clove such as analgesic property, anesthetic action, antibacterial property, antiparasitic action, antidotal property, antioxidant action, antiperspirant action, antiseptic property, carminative action, deodorant, digestive disorders, rubefacient action, stimulant property, stomachic action [20, 21].

3.7.1 Uses and health benefits

- It is mostly used in many households as an aid to prevent the minor disorders like indigestion, flatulence, tooth ache etc.
- Clove is highly valued medicine for their carminative, stimulant, antiflatulent and antihelmenthic properties.
- The dried buds are used as an analgestic and anesthetic.

- Among the spices, cloves are reported to have the highest antioxidant properties.
- It has aromatic and mild flavor.
- Used as a flavoring in bakery products & sweets, meat products pickles
- Clove bud oil is used in pharmaceuticals and dental formulation.

3.8 Black pepper (Kaali Mirch)

It is the fruits of plant black pepper and belongs to the family Piperaceae. Black pepper is used as both a spice and medicine. The native place of pepper is Kerala the Southern State of India. Kerala produces nearly 95% of the total pepper output. It is dried small round berry of a tropical vine with small white flower. Pepper possess its pleasant pungency and aroma due its oleoresin, which is present in the cells of pericarp. Peperine (4–10%) is the major constituent present in the pepper responsible for the biting taste of black pepper. Chavirine, peporidine and piperethine are the others alkaloids present in the small amount in pepper. The seeds of pepper also contain crude fiber range from 8 to 18%. Peppers are good source of Manganese, Iron, Calcium, Potassium, Vitamin A, C, K, Zinc, Chromium and other nutrients.

A numbers of medicinal benefits are found in peppers such as antihypertensive, anti-Alzheimer's, antidepressant, antiplatelets, anti-inflammatory, antioxidant, antipyretic, antitumor, antiasthmatic, analgesic, antimicrobial etc. It also stimulates the secretion of Hydrochloric acid in the stomach, resulting improves the digestion.

3.8.1 Uses and health benefits

- It is used with hot milk for throat infection.
- It is used effectively in the treatment of rheumatism and muscular pain, intestinal gas and headache.
- It is believed that peperine increase the bioavailability of other medicines by increasing their absorption and delaying their metabolism.
- Ancient Indian home remedies prescribe pepper as all antidote to cough and chest congestion.

3.9 Cinnamon (Dalchini)

Cinnamon (*Cinnamomum verum*) related to Lauraceae family is the most common spices used in the every household and commonly cultivated in the India, Sri Lanka, Bangladesh, and Nepal [20]. Cinnamon is obtained from the bark of the Cinnamon tree. The bark having 1% essential oil and the active compounds present in the oil are eugenol, cineole and cinnamaldehyde. It is used for making garam masala powder. It is also act as antioxidant due to presence of methyl hydroxyl chalcone polymer. Cinnamon having many important chemical constituents likes cinamaldehyde, cinnamic acid, and cinnamate that are providing many promising health benefits such as antioxidant, anti-inflammatory, antidiabetic, anti-microbial, immunity boosting, cancer and heart disease protecting abilities [22, 23]. The use of cinnamon with ginger stimulates the blood circulation and digestion [24].

3.9.1 Uses and health benefits

- It is use as antipyretic, lowering in body temperature, antiseptic, astringent, inflammatory problem, carminative, diaphoretic, fungicidal, stimulant, and stomachic.

- The powdered spice cinnamon bark in water is applied to overcome headaches and neuralgia.

- It regarded as a folk remedy for indurations (of spleen, breast, uterus, liver and stomach) and tumors (especially of the abdomen, liver and sinews).

3.10 Ajwain

It related to the Family Umbelliferae and originated in India. The leaves and seeds of the ajwain plant are edible in nature. Its seeds are resembles with the other seeds of Family Umbelliferae like caraway, cumin and fennel. The taste and flavor of the seeds are same as the aniseed and oregano. Bioactive compound present in the essential oil is thymol, which gives its bitingly hot and bitter taste that numbs the tongue when chewed. It is widely used as a spice in curries. In Ayurveda ajwain is prescribed as medicines for stomach disorder like indigestion, flatulence [25] diarrhea and colic [16].

3.10.1 Uses and health benefits

- It is a household remedy for indigestion.

- It is known for its antispasmodic, stimulant and carminative effect.

3.11 Fenugreek (Methi)

The common name of Fenugreek is maithray (Bangla, Gujarati), methi or mithi (Hindi, Nepali, Marathi, Urdu and Sanskrit). It is a kind of hard lentil seeds with dark fawn color and astringent aroma. It contains both soluble and insoluble fiber with 5% bitter fixed oil [26, 27]. Taste of this spice is bitter and thus used in small quantities in seasonings like sambar and kadhi. It improves the flavor and keeping quality of pickles.

3.11.1 Uses and health benefits

- Fenugreek seeds are having many medicinal properties such as digestive disorders, bronchitis, tuberculosis infection, skin irritations, ulcers and menopausal symptoms, diabetes.

- It is used to reduce blood sugar level.

- It is also used with butter milk in the treatment of dysentery.

3.12 Aniseed (Somfu)

It is small dried seed of an annual herb and native to the East Mediterranean region. It is cultivated in a small area in Rajasthan, Punjab, U.P and Orissa. The

major compound is anethole which has the flavor of liquorice. It is used a mouth refresher and used after the taking meals [28]. It is also used in preparation of cakes, bread, cookies, and non-vegetarian dishes.

3.12.1 Uses and health benefits

- An infusion of fennel is used to counteract flatulence.
- It is mildly carminative and used in treating colic pain.
- It is used as natural chief raw material in the pharmaceutics, perfumery, food and cosmetic industries.
- Aniseed essential oil is used to treat the cold and flu in aromatherapy.

3.13 Caraway

It is black dried seed has pleasant aromatic flavor and contain about 5% essential oil. The chief flavoring compound is D-carvone and D-limonere. Its seeds are used to flavor the cakes, biscuits, cheese, apple sause and cookies. Its fine powder is effective in cataract when applied at the early stages. From the ancient times caraway oil has been used by the women as secret the beauty. The combination of black cumin and caraway seeds oils have been used to killed parasites and worms, detoxify, ameliorate amoebic dysentery, shigellosis, abscesses, old tumors, ulcers of the mouth, and rhinitis.

3.13.1 Uses and health benefits

- It is used as a food flavorent.
- It is a mild stomachic and carminative.
- Its seeds have carminative effect.

3.14 Bay leaf (Tez Patta)

Bay leaf (Laurus nobilis) belongs to the family Lauraoeac and it is native to the Mediterranean and Asia. They are the dried aromatic leaves of laurel tree and contain 1–3% aromatic oil. Its oil is used in the preparation of pickling spice and flavoring of vinegar. The dried leaves are mainly used for developing flavor in meat, pulav, soups, fish, tomato pickle and birinj sweet.

3.14.1 Uses and health benefits

- It is used as flavoring agent in curries dishes.
- The leaves and fruits of bay leaf possess stimulant and narcotic properties
- Bay leaf helps relieve pain in joints, chest, womb and stomach.
- It also helps in digestion by stimulating gastric functions.

3.15 Asafoetida (Hing)

Asafoetida is also commonly known as Food of the God and native to Iran and Afghanistan. Asafoetida is an oleo gum resin exuded from the rhizome or root of ferula asafoetida. The flavor of asafoetida comes from the presence of a ferulic ester and sulfur containing volatile oil. It is good sources of protein, fiber, carbohydrates, calcium, phosphorous, iron, niacin, carotene and riboflavin. Asafoetida is very common and easily available spice in every home and effectively used in the treatment of indigestion, menstrual, pain, ear ache, body pains and tooth ache. It is available in the market mixed with starch (compound hing) to dilute the strong flavor.

3.15.1 Uses and health benefits

- It is used as an antimicrobial agent.
- It is increases the levels of detoxification enzymes in the body.
- It is also used in the treatment of chronic bronchitis and whooping cough.

3.16 Cumin seeds (jeera)

Cumin is especially grown in India, Syria, Iran and Turkey and related to the family Apiacae. The largest producer of cumin is India (70% of world cumin production) while the second largest producer is the Syria. The major importers of the Indian cumin are U.A.E, Central America, China and Vietnam. It contains essential oil 2 to 4% and the active compound is aldehyde cumino. The seeds are mainly used in curry and seasoning. It is also used in curry powder, sambar powder and rasam powder.

3.16.1 Uses and health benefits

- Cumin warm water drinking rehydrate the human body and keep refresh.
- It help in digestive system by enhancing the saliva secretion
- It improves the breast feeding in the lactating mother.
- Cumin seeds are used to lowers the blood sugar levels.
- It increases the hemoglobin level in the blood.
- It is act as very good antioxidant spice due to presence of anticarcinogenic agents such as thymol and dithymoquinone.

3.17 Poppy seeds

It is tiny kidney-shaped oilseed found from the poppy (Papaver somniferum). Currently poppy seed is legally cultivated and used in many countries mainly in Central Europe [20]. Its seeds are good source of thiamin, folate, and important minerals like calcium, iron, magnesium, manganese, phosphorus and zinc.

3.17.1 Uses and health benefits

- The seeds are used, whole or ground, as an ingredient in many foods.
- Poppy seeds are used as thickening agent and also give added flavor to the recipe.
- Commonly used in the preparation of korma, ground poppy seeds, along with coconut.
- In Indian traditional medicine it is used as a skin moisturizer.
- Poppy seeds oil is valuable commercial oil that has multiple culinary, industrial, and medicinal uses.

3.18 Nutmeg and mace

Nutmeg is the dried and hard seed or pit of the nutmeg fruit; however mace is the orange red fleshy covering of the nutmeg. It contains 7–14% essential oil and this oil contains a highly toxic compound is called myristicin. Nutmeg and mace are used in small amounts to flavor the pudding and fruit pie. It is used as ground state in the cakes, cookies, pies, chocolate, garam masala etc.

3.18.1 Uses and health benefits

- It has antimicrobial properties.

3.19 Saffron (Kesar)

Saffron is known as crocus sativa and it is grown in the dry land of Kashmir valley. Name of this spice given saffron due to the fragrant stigma found in the flower of the saffron fruits. It has matchless aroma among the all spices therefore sold costly in the market. For making one ounce of pure saffron 75000 flowers are needed. Saffron is used mainly for its yellow color. It has a pleasant aroma and an essential oil crocin and the coloring principle is crocerin. It is widely used is soups, sauses, mainly in rice dishes to give them bright yellow color and distinctive flavor. It is also used in many famous sweets like sandesh, rasmalai, kesar milk, ice-cream, halwa and shrikhand.

3.19.1 Uses and health benefits

- It is used as a sedative and also used for eye infection.

3.20 Kokum

Kokum (Garcinia indica choipsy) is cultivated in the western ghats in the Konkan, Goa, South Karnataka and Kerela. The color of the ripe fruit is the dark purple due to the presence of anthocyanin and having sufficient amount of malic acid. Its colorful red juice is used for the manufacture of beverages.

3.20.1 Uses and health benefits

- It is used as soring agent in cookery.

4. Use of spices and herbs for health benefits during Covid-19 pandemic

Corona virus disease (COVID-19) has been declared as a pandemic by World Health Organization. The disease significantly affected all age groups of peoples, mainly old age patients that are suffering from diabetes, hypertension, cerebral infarction, chronic bronchitis, Parkinson's disease, chronic obstructive pulmonary disease, cardiovascular disease, and cancer [29, 30]. In the case of positivity with COVID-19 peoples lose their immunity mild to severely, therefore the demand of the natural immunity booster like spices and herbs are widely undertaken. Spices have been known for their high antioxidant and antimicrobial activity due to presence of many bioactive compounds such as flavonoids, phenolic compounds, sulfur-containing compounds, tannins, alkaloids, phenolic and diterpenes [31, 32]. After reviewing the role of spices as an immunity booster, even the Ministry of AYUSH, Gov. of India has issued the guidelines on heral use based immunity promoting methods for self-care during the COVID-19 pandemic. The guidelines emphasizes the uses of spices like turmeric, cumin, coriander, and garlic that are suggested in cooking. The guidelines further advocates use of drink of herbal tea or decoction (kadha) made by basil, cinnamon, black pepper, ginger, and raisin once or twice in a day. Similarly, 150 ml hot milk with half teaspoon turmeric powder can also be taken once or twice in a day. Several spices such as clove, cinnamon, ginger, black pepper, and turmeric are used as immunity boosters along with their antiviral property [33, 34].

5. Conclusion

Commonly used spices in different foodstuffs are having broad spectrum of bio-functions due to presence of bioactive compounds (curcumin, crocerin, D-carvone, D-limonere aldehyde cumino, eugenol, capsaicin, thymol, gingerol etc.) which may provide promising health benefits to our body from the many common disorders like cough, cold, fever, headache, stomach problems, cancer etc. Presence of strong flavor and aroma spices are used in small quantities that impart lower calories to food, however it enriched the foods with varieties of essential minerals, although some spices derived form seed contain high amount of fat, protein and carbohydrates. In the present pandemic situation of covid-19, spices such as turmeric, ginger, clove, pepper, cinnamon, cardamom are widely used in different foods formulation like kadha, herbal tea, masala tea etc., which play major role to arrest or reduce the effect of this virus. After reviewing this chapter we can be able to used right spices in the appropriate disorders and get benefited by its amazing functional, medicinal and nutritional properties.

Conflict of interest

The authors declare no conflict of interest.

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References

[1] Manay N, Shadaskarswamy, M. Foods, facts and principles. New age international Pvt Ltd., New Delhi. 1999; 321-334.

[2] Khanum F, Krishna SKR, Semwal AD, Vishwanathan KR. Proximate compostion and mineral contents of spices. The Indian Journal of Nutrition and Diet. 2001; 38 (3): 93 - 96

[3] Sachan AK, Doli RD, Kumar M. Carum carvi-An important medicinal plant. Journal of Chemical and Pharmaceutical Research. 2016; 8(3): 529-533.

[4] Khajehdehi P. Turmeric: Reemerging of a neglected Asian traditional remedy. Journal of Nephropathology. 2012; 1(1): 17-22.

[5] Maqsood S, Singh P, Samoon MH, Munir K. Emerging role of immunostimulants in combating the disease outbreak in aquaculture. International Aquatic Research. 2011; 3: 147-163.

[6] Ravindran PN, Nirmal Babu K, Sivaraman K. The Golden Spice of Life. In: Turmeric. The Genus Curcuma. Boca Raton, FL, USA: CRC Press; 2007, 1-14.

[7] Szallasi A. Piperine: Researchers discover new flavor in an ancient spice. Trends in Pharmacology Science. 2005; 26(9): 437-439.

[8] Chattopadhyay I, Biswas K, Bandyopadhyay U, Banerjee RK. Turmeric and curcumin: Biological actions and medicinal applications. Current Science of India. 2004; 87:44-53.

[9] Gupta, S. C., Patchva, S., & Aggarwal, B. B. (2013). Therapeutic roles of curcumin: Lessons learned from clinical trials. The American Association of Pharmaceutical Scientists Journal, 15(1), 195–218.

[10] Jafri MA, Farah, Javed K, Singh S. Evaluation of the gastric antiulcerogenic effect of large cardamom (fruits of Amomum subulatum Roxb). Journal of Ethnopharmacology. 2001; 75(2–3): 89-94.

[11] Duke JA, Bogenschutz-Godwin MJ, deCellier J, Duke PK. Elettaria cardamomum Maton (Zingiberaceae) Cardamon, Malabar or Mysore cardamon, in CRC Handbook of Medicinal Spices. 2003; 120-138.

[12] Benavides GA, Squadrito GL, Mills RW, Patel HD, Isbell TS, Patel RP, Darley-Usmar VM, Doeller JE, Kraus DW. Hydrogen sulfide mediates the vasoactivity of garlic. 2007; PNAS. 104: 17977-17982.

[13] Agrawal M, Walia S, Dhingra S, Khambay BPS. Insect growth inhibition antifeedant and antifungal activity of compounds isolated derived from Zingiber officinale roscoe, ginger rhizome. Pest Management Science. 2001; 57: 289-300.

[14] Kikuzaki H, Kobayashi H, Nakatani N. Constituents of Zingiberaceae, diarylheptanoids from rhizomes of Zingiber officinale, Phytochemistry. 1991; 30: 3947-3952.

[15] Sachan AK, Doli RD, Senah LD, Shuaib, M. Asparagus racemosus (Shatavari): An overview. International journal of pharmaceutical and chemical sciences. 2012; 1(3) 588-592.

[16] Gilani AH, Bashir S, Khan AU. Pharmacological basis for the use of Borago officinalis in gastrointestinal, respiratory and cardiovascular disorders. Journal of Ethnopharmacology. 2007; 114:393- 399.

[17] British pharmacopoeia, Introduction General Notices Monographs, medicinal and Pharmaceutical, British pharmacopeia commission, London. 2003; Volume-1 (A-I); 542-543.

[18] Duke JA, Bogenschutz-Godwin MJ, deCellier J. Duke PK. Syzygium aromaticum (L.) Merr. and L. M. Perry (Myrtaceae) Clavos, Clove, Clovetree, in CRC Handbook of Medicinal Spices. CRC Press, Washington DC. 2003, 281.

[19] Daniel AN, Sartoretto SM, Schmidt G, Caparroz-Assef SM, Bersani-Amado CA, Cuman RKN. Anti- inflammatory and antinociceptive activities a of eugenol essential oil in experimental animalmodels. Revista Brasileira de Farmacognosia. 2009; 19: 212- 217.

[20] Bhat KS, Vivek K. Biocidal potential of clove oils against Aede albopictus – A comparative study. African Journal of Biotechnology. 2009; 8 (24):6933-6937, 15.

[21] Delaquis PJ, Stanich K, Girard B, Mazza G. Antimicrobial activity of individual and mixed fractions of dill, cilantro, coriander and eucalyptus essential oils. International Journal of Food Microbiology. 2002; 74(1–2): 101-109.

[22] Khan A, Safdar M, Khan AMM, Khattak KN, Anderson RA. Cinnamon improves glucose and lipids of people with type 2 diabetes. Diabetes Care. 2013; 26 (12): 215- 218.

[23] Bajpai M, Pande A, Tewari SK, Prakash D. Phenolic contents and antioxidant activity of some food and medicinal plants. International Journal of Food Science and Nutrition. 2005; 56 (4): 287-291.

[24] Doli RD, Sachan AK, Vishnoi G, Shuaib Mohd, Imtiyaz Mohd. A review on surveillance of herbal medicines. International Journal of Phytopharmacology. 2016; 7(2): 68-72.

[25] Al-Zuhair H, El-Sayeh B, Ameen HA, Al-Shoora H. Pharmacological studies of cardamom oil in animals. Pharmacological Research. 1996; 34(1–2): 79-82

[26] Basu SK, Acharya SN, Thomas JE. Appilcation of phosphate fertilizer and harvest management for important fenugreek (Trigonella foenum-graecum L.) seed and forage yield in a dark brown soil zone of Canada. KMITL Science and Technology Journal. 2008; 8(1): 1 –7.

[27] Hardman R, Fazli FRY. Methods of screening the genus Trigonella for steroidal sapogenins. Planta Medica. 1972; 21: 131–138.

[28] Cheung SC, Szeto YT, Benzie IF. Antioxidant protection of edible oils. Plant Foods Human Nutrition. 2007; 62 (1): 39-42.

[29] Deng SQ, Peng HJ. Characteristics of and public health responses to the coronavirus disease 2019 outbreak in China. Journal of Clinical Medicine. 2020; 9: 575.

[30] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Gu X. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet. 2020; 395(10223): 497–506.

[31] Patra K, Jana K, Mandal DP, Bhattacharjee S. Evaluation of the antioxidant activity of extracts and active principles of commonly consumed Indian spices. Journal of Environmental Pathology. Toxicology and Oncology. 2016; 35: 299-315.

[32] Yashin A, Yashin Y, Xia X, Nemzer B. Antioxidant activity of spices and their impact on human health: A review. Antioxidants. 2017; 6:70.

[33] Shrivastava R. Immunity boosters: Solutions from nature-herbs and spices. Journal of Renal Nutrition Metabolism. 2020; 6: 35-37.

[34] Srivastava AK, Chaurasia JP, Khan R, Dhand C, Verma S. Role of medicinal plants of traditional use in recuperating devastating COVID-19 situation. Medicinal Aromatic Plants (Los Angeles). 2020; 9: 359.