

## Medicinal Properties of Spices

Spice	Medicinal properties
Allspice	Stimulant, digestive, carminative, anodyne against rheumatism & neuralgia
Aniseed	mild expectorant, stimulating, carminative, diuretic, diaphoretic, in asthma powders, in veterinary medicine.
Basil, sweet	Stomachic, anthelmintic, diaphoretic, expectorant, antipyretic, carminative, stimulant, diuretic, demulcent, in skin diseases, asthma, ophthalmia.
Bay leaves (laurel)	Stimulant in sprains, narcotic & in veterinary medicine
Bishop's weed (Ajowan)	Digestive, antispasmodic, stimulant, carminative, expectorant.
Caper	Diuretic, aspirant, expectorant, emmenagogue, tonic & in scurvy, rheumatism, gout, afflictions of liver and spleen.
Capsicum	Digestive, thermogenic, carminative, stimulant, cardiogenic, antipyretic, serdorigic, rubefacient & sialagogue.
Caraway	Stomachic, carminative, anthelmintic, lactagogue, adjuvant/ corrective for nauseating & griping effects of medicines.
Cardamom (small)	Stimulant, tonic, diuretic, carminative, digestive, expectorant, cardiogenic & used in several pharmaceutical preparations.
Cardamom (large)	Hypnotic, appetizer, astringent to bowels, tonic to heart and liver.
Cambodge	Astringent, digestive, thermogenic, constipating, used in haemorrhoids, diarrhea, & to control obesity.
Cassia	Astringent, stimulant, carminative, germicidal & for checking nausea & vomiting
Celery	Stimulant, tonic, diuretic, carminative, emmenagogue, anti-inflammatory
Cinnamon	Astringent, diuretic, carminative, aphrodisiac, deodorant, expectorant, febrifuge, stomachic.
Clove	Refrigerant, ophthalmic, digestive, carminative, stomachic, stimulant, antispasmodic, antibacterial, expectorant, rubefacient, Aphrodisiac, appetizer, emollient.
Coriander	Carminative, diuretic, tonic, stimulant, stomachic, refrigerant, aphrodisiac, analgesic, anti-inflammatory
Cumin	Digestive, carminative, astringent, anti-inflammatory, constipating, diuretic, revulsive, galactagogue, uterine & nerve stimulant.
Curry leaf	Astringent, anthelmintic, febrifuge, stomachic, appetizing, carminative, constipating, anti-inflammatory, antiseptic, used in skin diseases, in diarrhea, ulcers.
Dill	Carminative, stomachic, antipyretic.
Fennel	Stimulant, carminative, stomachic, emmenagogue, refrigerant, cardiac stimulant, antiemetic, aphrodisiac, anthelmintic
Fenugreek	Carminative, tonic, aphrodisiac, emollient, antibacterial, used in vomiting, fever, anorexia, colonitis.
Garlic	Anticholesterol, antifungal, tonic, rubefacient, stimulant, thermogenic, aphrodisiac, used in cough, asthma, cardiopathy.
Ginger	Digestive, carminative, emollient, appetizer, stomachic, rubefacient, anodyne, expectorant, anthelmintic, stimulant.
Greater galanga	Carminative, expectorant, digestive, vulnerary, febrifuge, stimulant, depurative, used in skin diseases, rheumatism, asthma, wounds, fever, haemorrhoids.
Horse radish	Thermogenic, appetizing, digestive, stomachic, laxative, anti-inflammatory, anodyne, refreshing, antibacterial.
Hyssop	Stimulant, carminative, pectoral, used in nervous disorders, toothache, pulmonary & uterine troubles.
Juniper Berry	Carminative, stimulant, diuretic, useful in dropsy, leucorrhoea, urino genital disorders.
Kokam	Cooling, anthelmintic, cardiogenic, astringent, emollient, useful in piles, dysentery, heart complaints, bilious affections.
Mace	Cooling, febrifuge, expectorant.

Marjoram	Carminative, expectorant, tonic, astringent
Mint	Stimulant, stomachic, carminative, antiseptic, digestive, antispasmodic, contraceptive, used in vomiting, skin diseases, Amenorrhoea, dental caries.
Mustard	Thermogenic, anodyne, anti inflammatory, carminative, digestive, anthelmintic, sudorific, tonic, emetic, used in vomiting, abdominal colic, dyspepsia, flatulence, skin diseases.
Nutmeg	Astringent, sweet, thermogenic, aphrodisiac, anti inflammatory, anodyne, deodorant, digestive, expectorant, narcotic, anticonvulsant, antiseptic, constipating.
Oregano	Stimulant, carminative, stomachic, diuretic, diaphoretic and emmenagogue
Parsley	Stimulant, diuretic, carminative, emmenagogue, antipyretic, anti inflammatory, emetic, aphrodisiac, alexipharmic, refrigerant.
Pepper	Anthelmintic, carminative, alterant, antiperiodic, diuretic, digestive, emmenagogue, rubefacient, stimulant, stomachic, used in fever, asthma, cough, dyspepsia, flatulence, arthritis.
Pepper long	Expectorant, thermogenic, diuretic, tonic, purgative, stomachic, digestive, emollient, antiseptic, used in bronchitis, fever, asthma.
Pomegranate	Astringent, cooling, tonic, aphrodisiac, laxative, diuretic, cardiogenic, used in pectoral diseases, dysentery, diarrhea, vomiting.
Poppy seeds	Expectorant, sudorific, sedative, nervine tonic, constipating, aphrodisiac, used in internal haemorrhages, diarrhoea, dysentery.
Rosemary	Astringent, nervine tonic, stomachic, antibacterial, protistocidal, rubefacient, used in head aches and hardy menstruation.
Saffron	Stimulant, tonic, stomachic, aphrodisiac, anodyne, anti spasmodic, emmenagogue, diuretic, laxative, used in bronchitis, fever, epilepsy, skin diseases, decolouration of skin.
Sage	Mild tonic, astringent, carminative, deodorant, insecticidal, antipyretic, used in gingivitis, dentifrice, mouthwash, gargles.
Savory	Antispasmodic, antiarrhal, astringent, carminative, laxative, diuretic, stomachic, sudorific, vermifuge.
Star anise	Astringent, carminative, deodorant, expectorant, digestive.
Sweet flag	Thermogenic, constipating, emmenagogue, intellect promoting, emetic, carminative, stomachic, expectorant, sudorific, antipyretic, resuscitative, tranquilising, sedative, nervine tonic.
Tamarind	Refrigerant, digestive, carminative, laxative, antiscorbutic, febrifuge, ophthalmic useful in gastropathy, datura poisoning, alcoholic intoxication, scabies, constipation.
Tarragon	Aperient, stomachic, stimulant, febrifuge
Tejpat	Carminative, used in colic, diarrhoea.
Thyme	Antispasmodic, carminative, emmenagogue, anthelmintic, spasmodic, laxative, stomachic, tonic, vermifuge
Turmeric	Thermogenic, emollient, anodyne, anti inflammatory, vulnerary, depurative, antiseptic, appetizer, carminative, expectorant, stomachic, anthelmintic, stimulant, ophthalmic, tonic, used in skin diseases, dyspepsia, asthma, cough, bronchitis, inflammations, ulcers, worms, skin discolouration.
Vanilla	Aphrodisiac.

## Insect repellent properties of spices

Spice	Mode of application	Insects
Fenugreek	Seed extract	<i>Tribolium castaneum</i> .
Fennel	Direct contact and fumigation	<i>Acanthoscelides obtectus</i> <i>Callosobruchus chinensis</i> . <i>Lasioderma serricorne</i>
Indian dill	Essential oil	<i>Callosobruchus maculatus</i>
Dill	Essential oil.	<i>Luciliasericata</i>
Peppermint and basil	Powdered aerial parts	<i>Callosobruchus maculatus</i>
Basil	Fumigation of essential oil	<i>Drosophila melanogaster</i>
Mint	Essential oil	<i>Callosobruchus analis</i>
Peppermint	Leaf powder	<i>Tetranychus cinnabarinus</i> , <i>Aphis gossypii</i> , <i>Tribolium confusllm</i> .
Cumin and anise	Vapour of essential oil	<i>Ephestia kuehniella</i> <i>Acanthoscelides obtectus</i>
Oregano	Essential oil	<i>Tetranychus cinnabarinus</i> . <i>Aphis gossypii</i>

## Antimicrobial activity of spices

Spice	Mode of application	Activity against bacteria	Activity against fungus
Basil	Essential oil		<i>Ascophaera apis</i>
Basil	Methyl chavicol	<i>Aeromonas hydrophylla</i> , <i>Pseudomonas flourescens</i>	
Coriander	Essential oil		<i>Ascophaera apis</i>
Fenugreek	Seed saponins		<i>Fusarium oxysporum</i> f. sp. <i>Iycopersici</i>
Fenugreek	Essential oil	<i>Bordetella bronchiseptica</i> , <i>Bacillus cereus</i> , <i>Bacillus pumilus</i> , <i>Bacillus subtilis</i> , <i>Micrococcus flavus</i> , <i>Staphylococcus aureus</i> ,	

Cumin	Essential oil	<i>Sarcina lutea, Escherichia coli, Proteus vulgaris</i>	<i>Penicillium notatum, Aspergillus niger, Aspergillus funigatus, Microsporum canis</i>
Fennel Ajowan	Essential oil Seed extracts	<i>Staphylococcus aureus, Bacillus subtilis</i>	<i>Pythium aphanidematum, Macrophomina phaseolina, Rhizactonia solani</i>
Allspice	Plant extract:		<i>Fusarium spp., Alternaria spp. and Cladosporium spp, Apsergillus niger</i>
Oregano, coriander and basil, <i>Anethum graveolens,</i>	Essential oil Seed diffusates coriander	<i>Listeria monocytogenes, Staphylococcus aureus Escherichia coli, Yersinia enterocolitica, Pseudomonas aeruginosa, Lactobacillus plantarum</i>	<i>Alternaria alternata, Fusarium solani, Macrophomina phaseolina</i>
Pepper mint, thyme, caraway	Essential	<i>Agrobacterium tumefaciens, Ralstonia solanacearum, Erwinia carotovora</i>	
Spearmint, basil, parsley	Essential oil	<i>Staphylococcus aureus, Escherichia coli</i>	<i>Candida albicans, Aspergillus niger</i>
Oregano and mint Oregano	Essential oil Essential oil or carvacrol		<i>Aspergillus ochraceus Candida albicans</i>
Oregano, thyme	Essential oil or Carvacrol	<i>Streptococcus pneumoniae R36a. Bacillus cereus</i>	

## Antioxidants isolated from spices

### Spice

### Antioxidants

Rosemary	Carnosic acid, carnosol, rosemarinic acid, rosmanol
Sage	Carnosol, carnosic acid, rosmanol, rosmarinic acid
Oregano	Derivatives of phenolic acid, flavonoids, tocopherols
Thyme	Carvacrol thymol, <i>p-cymene</i> , caryophyllene, carvone, borneol
Summer savory	Rosmarinic acid, carnosol, carvacrol, thymol
Marjoram	Flavonoids
All spice	Pimentol
Ginger	Gingerol, related compound Diarylheptanoids
Turmeric	Curcumins
Black pepper	Phenolic amides. flavonides
Red pepper	Capsaicin
Chilli pepper	Capsaicin. capsaicinol
Clove	Eugenol. gallates

## Spices and herbs used in alcoholic beverages

### Alcoholic beverages

### Spices and herbs used

Vermouth	Marjoram, sage, coriander, ginger, cardamom. clove, mace, peppermint, thyme, anise, juniper berry
Gin	Coriander, juniper berry
Aquavit	Anise, fennel. dill, caraway
Curacao	Cinnamon, clove, nutmeg, coriander
Kummel	Caraway, fennel, coriander
Anisette	Anise, fennel, nutmeg
Ganica	Cinnamon, cardamom, coriander, mint, fennel. clove, pepper
Geme de cumin	Cumin
Geme de cacao	Clove, mace, vanilla
Geme de menthe	Peppermint
Peppermint schnapps	Peppermint

## Basic uses of herbs and spices

### Basic function

Flavouring

### Spices (Major Function)

Parsley, cinnamon, allspice, dill, mint, tarragon, cumin, marjoram, star anise, basil, anise, mace, nutmeg, fennel, sesame, vanilla, fenugreek, cardamom, celery

### Spices (Sub Function)

Garlic, onion, bay leaves, clove, thyme, rosemary, caraway, sage, savory, coriander, pepper, oregano, horseradish, Japanese pepper, saffron, ginger, leek, mustard

Deodorizing/masking

Garlic, savory, bay leaves, clove, leek, thyme, rosemary, caraway, sage, oregano, onion, coriander

Pungency

Garlic, savory, bay leaves, clove, leek, thyme, rosemary, caraway, sage, oregano, onion, coriander, Japanese pepper, mustard, ginger, horseradish, red pepper, pepper horseradish, japanese pepper, nutmeg  
Paprika, turmeric, saffron

Parsley, pepper, allspice, mint, tarragon, cumin, star anise; mace, fennel, sesame, cardamom, mustard, cinnamon, vanilla, ginger

Colouring

Source: Ravindran *et al.* (2002).

## Colour components in spices

Colour component	Tint	Spice
Carotenoid		
B-carotene	Reddish orange	Red pepper, Mustard, paprika, saffron
Cryptoxanthin	Red	Paprika, red pepper
Lutin	Dark red	Paprika, parsley
Zeaxanthin	Yellow	Paprika
Capsanthin	Dark Red	Paprika, red pepper
Capsorbin	Purple red	Paprika, red pepper
Crocetin	Dark red	Saffron
Neoxanthin	Orange yellow	Parsley
Violaxanthin	Orange	Parsley, sweet pepper
Crocin	Yellowish orange	Saffron
Flavonoids	Yellow	Ginger
Curcumin	Orange yellow	Turmeric
Chlorophylls	Green	Herbs

**NUTRITIVE VALUE OF SPICES  
(APPROXIMATE COMPOSITION/100g OF EDIBLE PORTION)**

<b>Spice</b>	<b>Energy (k cal.)</b>	<b>Protein (g)</b>	<b>Fat (g)</b>	<b>Total CHO (g)</b>	<b>Fibre (g)</b>	<b>Ash (g)</b>	<b>Calcium (mg)</b>	<b>Fe (mg)</b>	<b>Mg (mg)</b>	<b>P (mg)</b>	<b>K (mg)</b>	<b>Na (mg)</b>	<b>Zn (mg)</b>	<b>Ascorbic acid (mg)</b>	<b>Thiamin (mg)</b>	<b>Riboflavin (mg)</b>	<b>Niacin (mg)</b>	<b>Vitamin A (IU)</b>
Sweet basil	251	14.4	4.0	61.0	17.8	14.3	2113	42	422	490	3433	34	6	61.2	0.1	0.3	6.9	9375
Bay	313	7.6	8.4	75.0	26.3	3.6	834	43	120	113	529	23	4	-	-	-	2	6185
Marjoram	271	12.7	7.0	60.6	18.1	12.1	1990	83	346	306	1522	77	4	51	-	-	4	8068
Oregano	306	11.0	10.3	64.4	15.0	7.2	1576	44	270	200	1669	15	4	-	-	-	6	6903
Parsley	276	22.4	4.4	51.7	10.3	12.5	1468	98	249	351	3805	452	5	122	-	18	23	340
Rosemary	331	4.9	5.2	64.1	17.7	6.5	1280	29	220	70	955	50	3	61	-	-	1	3128
Sage	315	10.6	12.7	60.7	18.1	8.0	1652	28	428	91	1070	11	5	32	-	-	6	5900
Tarragon	295	22.8	7.2	50.2	7.4	12.0	1139	32	347	313	3020	62	4	-	-	1	9	4200
Thyme	276	9.1	7.4	63.9	18.6	11.7	1890	124	220	201	814	55	6	-	-	-	5	3800

Source: Farrel ( 1990).