

Chapter 1 The spices The spice is a dried seed, fruit, root, bark or vegetative substance used in nutrition insignificant amounts as food additive for flavor, color, or as a preservative that kills harmful bacteria. The spread of thyme throughout Europe was thought to be due to the Romans, as they used it to purify their [1] rooms and to "give an aromatic flavour to cheese and liqueurs". In the European Middle Ages, the herb was placed beneath pillows to aid sleep [2] and ward off nightmares. In this period, women also often gave knights and warriors gifts that included thyme leaves, as it was believed to bring courage to the bearer. Thyme was also used as incense and placed on coffins during funerals, as it was supposed to assure passage into the next life. The name of the genus of fish *Thymallus*, first given to the grayling (*T. thymallus* described in the 1758 edition of *Systema Naturae* by Swedish zoologist Carl Linnaeus) originates from the faint smell of the herb thyme, which emanates from the flesh. Cultivation: Thyme is best cultivated in a hot, sunny location with well-drained soil. It is generally planted in the spring, and thereafter grows as a perennial. It can be propagated by seed, cuttings, or dividing rooted sections of the [5] plant. It tolerates drought well. The plants can take deep freezes and are found growing wild on mountain highlands. Along the Italian Riviera, it is found from sea level up to 800 m. Medicinal use: Thyme (*Thymus vulgaris*) essential oil Oil of thyme, the essential oil of common thyme (*Thymus vulgaris*), contains 20–54% thymol. Thyme essential oil also contains a range of additional compounds, such as p-cymene, myrcene, borneol, and linalool. Thymol, an antiseptic, is an active ingredient in various [8] commercially produced mouthwashes such as Listerine. Before the advent of modern antibiotics, oil of thyme was used to medicate [1] bandages. It has also been shown to be effective against various fungi that commonly infect toenails. Thymol can also be found as the active ingredient in some all-natural, alcohol-free hand sanitizers. A tisane made by infusing the herb in water can be used for coughs and bronchitis. Thyme is used also as: ? Carminative ? Digestive ? Antimicrobial ? Antiseptic ? Antispasmodic ? Anthelminthic ? Expectorant Laurel (*Laurus nobilis* L.) ?????? ??? Plant family Lauraceae (laurel family). Used plant part Leaves. Industrially, laurel oil is prepared from the fruits, which may also be used as a spice with great success. The Lauraceae are the laurel family, that includes the true laurel and its closest relatives. The family comprises over 3000 species of flowering plants in over 50 genera worldwide. They occur mainly in warm temperate and tropical regions, especially Southeast Asia and South America. Many are aromatic evergreen trees or shrubs, but some, such as Sassafras, are deciduous, or include both deciduous and evergreen trees and shrubs, especially in tropical and temperate climates. *Cassytha* is a genus unique to the Lauraceae family in that it is a genus of parasitic vines. Origin Probably Asia Minor. Today, the laurel tree grows all over the Mediterranean. Turkey is one of the main exporters. Phytochemistry: The adaptation of Lauraceae to new environments has followed a long evolutionary journey which has led to many specializations, including defensive or deterrent systems against other organisms. Phytochemicals in the Lauraceae are numerous and diverse. Benzylisoquinoline alkaloids include aporphines and oxoaporphines, as well as derivatives of morphinans. Essential oils include terpenoids, benzylbenzoates, allylphenols, and propenylphenols. Lignans and neolignans are present. *Laurus nobilis* is an aromatic evergreen tree or large shrub with green, glossy leaves, native to the Mediterranean region. It is one of the plants used for bay leaf seasoning in cooking. It is known as bay laurel, sweet bay, bay tree (esp. United Kingdom), true laurel.

Worldwide, many other kinds of plants in diverse families are also called "bay" or "laurel", generally due to similarity of foliage or aroma to *Laurus nobilis*, and the full name is used for the California bay laurel (*Umbellularia*), also in the family Lauraceae. Another 2009 study on curcumin effects on cancer states that curcumin "modulates growth of tumor cells through regulation of multiple cell signaling pathways including cell proliferation pathway (cyclin D1, c-myc), cell survival pathway (Bcl-2, Bcl-xL, cFLIP, XIAP, c-IAP1), caspase activation pathway (caspase-8, 3, 9), tumor suppressor pathway (p53, p21) death receptor pathway (DR4, DR5), mitochondrial pathways, and protein kinase pathway (JNK, Akt, and AMPK)". When 0.2% curcumin is added to diet given to rats or mice previously given a carcinogen, it significantly reduces colon carcinogenesis (Data from sixteen scientific articles reported in the Chemoprevention Database). Potential risks and side-effects Kawanishi et al. (2005) remarked that curcumin, like many antioxidants, can be a "double-edged sword" where in the test tube, anti-cancer and antioxidant effects may be seen in addition to pro-oxidant effects. Treatment of the disorders affecting digestive tract ? Although nigella is not mentioned in the common Bible translations, there is good evidence that an obscure plant name mentioned in the Old Testament means nigella; if true, this would indicate that nigella is cultivated since far more than two millennia Main constituents The seeds contain numerous esters of structurally unusual unsaturated fatty acids with terpene alcohols (7%); furthermore, traces of alkaloids are found which belong to two different types: isochinoline alkaloids are represented by nigellimin and nigellimin-N-oxide, and pyrazol alkaloids include nigellidin and nigellicin. Production: Ginger production, 2013 Country Production (millions of tonnes) India 0.683 China 0.390 Nepal 0.235 Indonesia 0.233 Nigeria 0.160 World 2.1 Source: Food and Agricultural Organization of the United Nations, FAOSTAT Folk medicine: Ginger was classified as a stimulant and carminative and used frequently for dyspepsia, gastroparesis, slow motility symptoms, constipation or colic. Black seed Unripe Nigella capsule (culinary) Capsule of N. Ciliaris Nigella plant with unripe seed pods In some English sources, it is called black cumin, black caraway (for its usage, together with caraway, in Jewish rye breads) and black onion seed (motivated by the similarity to the seeds of onion). The seeds also contain a fixed oil rich in unsaturated fatty acids, mainly linoleic acid (50 – 60%), oleic acid (20%), eicodadienoic acid (3%) and dihomolinoleic acid (10%) which is characteristic for the genus. Medicinal uses: Antibacterial Antifungal Appetizer Carminative Diaphoretic Digestive Expectorant Stimulant Edible parts: Leaves and seeds. A previous (1999) study performed at University of Cincinnati indicated that curcumin is significantly associated with protection from infection by HSV-2 in animal models of intravaginal infections. Medicinal uses: Turmeric is used for: oDiarrhea oPreparation of medicinal oil oInflammation and wound healing oIntestinal gas oBlood purifier oOintments oGall bladder disorders oLeprosy oStomach pain oEye infections oDropsy oSeveral types of cancer such as prostate, breast, skin and colon Turmeric and dye. Curcumin Keto form Curcumin Enol form Potential medical uses Curcumin acts as a free radical scavenger and antioxidant, inhibiting lipid [16] peroxidation and oxidative DNA damage. The same study showed that curcumin inhibited the recruitment of RNA polymerase II to viral DNA, thus inhibiting the transcription of the viral DNA. Chemistry: The characteristic odor and flavor of ginger is caused by a mixture of zingerone, shogaols, and gingerols, volatile oils that compose one to three percent of the weight of fresh ginger. In laboratory animals, the gingerols increase the motility of the

gastrointestinal tract and have analgesic, sedative, antipyretic, antibacterial properties. The chemical compound lauroside B isolated from *Laurus nobilis* is an inhibitor of human melanoma (skin cancer) cell proliferation at high concentrations in-vitro. A traditional folk remedy for rashes caused by poison ivy, poison oak, and stinging nettle is a poultice soaked in boiled bay leaves. Other uses: Bay is widely cultivated as an ornamental plant in regions with Mediterranean or oceanic climates, and as a house plant or greenhouse plant in colder regions. scientific name *Sinapis alba* White mustard plant White mustard seed Description White mustard is an annual, growing to 70 cm high with stalkless pinnate leaves. White mustard has fewer volatile oils and the flavor is considered to be milder than that produced by black mustard seeds. Chemistry: White mustard contains an enzyme called myrosin, glucoside sinalbin which yield upon hydrolysis. Carcinogenic effects are inferred from interference with the p53 tumor suppressor pathway, an important factor in human colon cancer. Clinical studies in humans with high doses (2–12 grams) of curcumin have shown few side effects, with some subjects reporting mild nausea or . More recently, curcumin was found to alter iron metabolism by chelating iron and suppressing the protein hepcidin, potentially causing . Ginger (*Zingiber officinale*) is a flowering plant, in the family Zingiberaceae whose rhizome is widely used as a spice or a folk medicine. Ginger is in the family Zingiberaceae and is closely related to turmeric, *Curcuma longa*, and cardamom, *Elettaria cardamomum*. The pungent taste of ginger is due to nonvolatile phenylpropanoid-derived compounds, particularly gingerols and shogaols, which form from gingerols when ginger is dried or cooked. Commercial nigella oil (Black Seed Oil, Black Cumin Oil) may also contain parts of the essential oil, mostly thymoquinone, by which it acquires an aromatic flavour. Thyme is of the genus *Thymus* of the mint family (Lamiaceae), and a relative of the oregano genus *Origanum*. The herb is much cultivated in Eastern and Southern Europe and Northern Africa, but also in the US. History: Ancient Egyptians used thyme for embalming. The fruit contains up to 30% fatty oils and about 1% essential oils (terpenes, sesquiterpenes, alcohols, and ketones). Dried laurel berries and pressed leaf oil can both be used as robust [6] spices, and the wood can be burnt for strong smoke flavoring. In massage therapy, the essential oil of bay laurel is reputed to alleviate arthritis and rheumatism, while in aromatherapy, it is used to treat earaches and high blood pressure. Because of their rapid growth it covers crops to suppress weeds in the fall, acting as organic pesticides and fumigators. The seeds contain protein, crude fat, moisture, N free extract, fiber and ash. Curcuminoids induce glutathione S-transferase and are potent inhibitors of cytochrome P450. A 2008 study at Michigan State University showed that low concentrations of curcumin interfere with Herpes simplex virus-1 (HSV-1) [14] replication. Curcumin can interfere with the activity of the transcription factor NF- $\kappa$ B, which has been linked to a number of inflammatory diseases such as cancer. A 2009 study suggests that curcumin may inhibit mTOR complex I via a novel mechanism. It is a herbaceous perennial which grows annual stems about a meter tall bearing narrow green leaves and yellow flowers. Zingerone is also produced from gingerols during this process; this compound is less pungent and has a spicy-sweet aroma. Characteristics: The laurel can vary greatly in size and height, sometimes reaching 10–18 metres (33–59 ft) tall. The genus includes three species, whose diagnostic key characters often overlap (Mabberley 1997). A recent study found considerable genetic diversity within *L. nobilis*, and [4] that *L. azorica* is not genetically or

morphologically distinct. Chemical constituents: The most abundant component found in laurel essential oil is 1,8- cineole, also called eucalyptol. Uses: The yellow flowers of the plant produce hairy seed pods, with each pod containing roughly a half dozen seeds. These seeds are harvested just prior to the pods becoming ripe and bursting. White mustard, scientific name *Sinapis alba* is an annual plant and member of the Brassicaceae family. The oil of it is used as lubricant and for lighting Turmeric (scientific name *Curcuma longa* L.) It has a warm, bitter taste and is frequently used to flavor or color curry powders, mustards, butters, and cheeses. antioxidant, antiarthritic, anti-amyloid, anti-ischemic and anti-inflammatory properties. In HIV, it appears to act by interfering with P300/CREB-binding protein (CBP). Carcinogenic and LD tests in mice and rats, however, have failed to establish a relationship between tumorigenesis and administration of . Peppercorns Plant with ripening pepper berries Used plant part Dried fruits, usually known as peppercorns. Ginger originated in the lush tropical jungles in Southern Asia. [6]-gingerol (1-[4'- hydroxy-3'-methoxyphenyl]-5-hydroxy-3-decanone) is the major pungent principle of ginger. Oral or topical uses of ginger to treat various disorders, such as nausea or arthritis pain. The black cumin fruit has numerous seeds which are used as spice, Used plant part The deep black, sharp-edged seed grains., [6]-gingerol Thyme (/ˈtalm/) is an evergreen herb with culinary, medicinal, and ornamental uses. *Laurus* is a genus of evergreen trees belonging to the Laurel family, Lauraceae. Human uses: Food The plant is the source of several popular herbs and one spice used in a wide variety of recipes, particularly among Mediterranean [2] cuisines. Dried leaves used in silos to protect stored beans, grains from weevils and other grain eating insects. It is used in topiary to create single erect stems with ball-shaped, box-shaped or twisted crowns; also for low [11] hedges. White mustard seeds are hard round seeds, usually around 1.0 to 1.5 mm (0.039 to 0.059 in) in diameter, with a color ranging from beige or yellow to light brown. The seeds contain sinalbin, which is a thioglycoside responsible for their pungent taste. Origin: White mustard originates from the Mediterranean region. Anti-inflammatory properties may be due to inhibition of eicosanoid biosynthesis. In addition it may be effective in treating malaria, prevention of cervical cancer, and may interfere with the replication of the HIV virus. Depending on harvest time and processing, peppercorns can be black, white, green and red (actually, reddish brown). The traditional types are black and white; dried green peppercorns are a more recent innovation, but are now rather common in Western countries. Ginger was exported to Europe via India in the first century AD as a result of the lucrative spice trade and was used extensively by the Romans. Ginger contains up to 3% of a fragrant essential oil whose main constituents are sesquiterpenoids. Ginger is a minor chemical irritant and, because of this, was used as a horse suppository by pre-World War I mounted regiments for feaguing. In limited studies, ginger was found to be effective for treating nausea caused by seasickness, morning sickness, and chemotherapy. Saturated fatty acids (palmitic, stearic acid) amount to about 30% or less. Names like Turkish kekik or Arabic zatar/satar [6]-gingerol The ancient Greeks used it in their baths and burnt it as incense in their temples, believing it was a source of courage. Each flower is pale yellow-green, about 1 cm diameter, and they are borne in pairs beside a leaf. Alternative medicine: Aqueous extracts of bay laurel can also be used as astringents and even as a reasonable salve for open wounds. Together with a gold form, *L. nobilis* 'Aurea', it has gained [12] the Royal Horticultural Society's Award of Garden Merit. Laurel

oil is a main ingredient, and the distinguishing characteristic of Aleppo soap. Many spices are also used for other purposes such as:– 1) Turmeric is used as preservative. There are many spices such as: o Turmeric o White mustard o Ginger o Pepper o Black seed o Thyme o Laurel (Bay laurel) White mustard???? White mustard is grown for its fresh greens or left to dry and harvested for its seeds. Toxicity: The seeds have a cathartic acid due to liberation of H<sub>2</sub>S on contact with water. Oil of White mustard: The seed contain 35% of semi-drying oil. Chemistry: Curcumin Curcumin is the principal curcuminoid of the popular Indian spice turmeric. Curcumin can exist in at least two tautomeric forms, keto and enol. In vitro and animal studies have suggested the curcumin may have , antitumor. This effect was shown to be independent of effect on histone acetyltransferase activities of p300/CBP. Anticancer effects Its potential anticancer effects stem from its ability to induce apoptosis in cancer cells without cytotoxic effects on healthy cells. curcumin in turmeric oleoresin at >98% concentrations. Peppercorns are also available pickled in brine or vinegar. This is the traditional form of preserving green peppercorns, but in recent years, preserved red peppercorns have become increasingly popular. Family Zingiberaceae Fresh ginger rhizome Dried ginger Ginger is a spice which is used for cooking and medicine. Ginger leaves are occasionally used for flavoring in ginger producing countries. Gingerols can inhibit growth of ovarian cancer cells in vitro. Ginger has a sialagogue action, stimulating the production of saliva, which makes swallowing easier. Human studies suggested that 1g/day of ginger may be safe and effective for pregnancy associated with nausea and vomiting when used for short period ( 4 days). Nigella sativa is [1] a black cumin (also known as nigella or kalonji). Medicinal use of Nigella sativa : It has been traditionally used for: ?The laurel is dioecious (unisexual), with male and female flowers on separate plants. The fruit is a small, shiny black berry-like drupe about [2] [3] 1 cm long that contains one seed. lauri folii), consisting of 45% eucalyptol. The fruit is pressed and water-extracted to obtain these products. Most commonly, the aromatic leaves are added whole to Italian pasta sauces. However, even when cooked, whole bay leaves can be sharp [5] and abrasive enough to damage internal organs, so they are typically removed from dishes before serving, unless used as a [6] simple garnish. When ground and mixed with other ingredients, a paste or more standard condiment can be produced. Powdered seeds used as a food flavouring. The other two curcuminoids are desmethoxycurcumin and bis-desmethoxycurcumin. The curcuminoids are polyphenols and are responsible for the yellow color of turmeric. In animal studies, hair loss (alopecia) and lowering of blood pressure have . In the fresh state, it has a characteristic staghorn-like appearance; dried ginger is usually sold in form of an off- white to very light brown powder. Although ginger no longer grows wild, it is thought to have originated on the Indian subcontinent. The ginger plants grown in India show the largest amount of genetic variation. The larger the number of genetic variations, the longer the plant has grown in that region. Individuals with gallstones should consult a doctor before taking ginger. It is an annual flowering plant in the family Ranunculaceae. Nigella sativa can grow to be 20–30 cm (7.9–11.8 in) tall. Origin Probably Western Asia. Skin Thyme (Thymus vulgaris L.) ?????? The most common variety is Thymus vulgaris. The leaves are 6–12 cm long and 2–4 cm broad, with an entire (untoothed) margin. The leaves contain about 1.3% essential oils (ol. Both essential and fatty oils are present in the fruit. Whole bay leaves are used almost exclusively as flavor agents during the food preparation stage. Ground bay leaves, however, can be ingested safely and are often used in soups and

stocks, as well as being a common addition to a Bloody [6] Mary.2) Liquorice is used in medicin. 3) Garlic is used as a vegetable.They can be used whole for pickling or toasted for use in dishes.It is also planted as feedstock or as a green manure.Leaves have a hot pungent flavor.Seeds are eaten raw, used in salads.You probably know turmeric as the main spice.But the root of turmeric is also used widely to make medicine.It is used to color and flavor of foodstuff.The enol form is more energetically stable in the solid phase and in solution.iron deficiency in susceptible patients.Pepper (Piper nigrum L.)?????Plant family Piperaceae (pepper family).Red peppercorns, however, are still a very rare commodity.There is no pickled black or white pepper.Ginger (Zingiber officinale) ????????Used plant part: The large, fleshy rhizome.Motion sickness: Ginger is effective in reducing symptoms associated with motion sickness.Precaution: Side effects associated with ginger are rare.Given in flatulent colic.It may lower cholesterol and help prevent the blood from clotting.Available forms of ginger: Including capsules, oil, ginger bread, ginger ale and ginger sticks.Black seed (Nigella sativa L.) ????It is from south and southwest Asia.Plant family Ranunculaceae (buttercup family).Lemon thyme Thyme ??????Origin Southern Europe.On some leaves the [2] margin undulates.The laurel are mainly used in: ?Used in manufacture of some types of soaps ?There are white, yellow and black mustard.Family (Zingiberaceae).Description Turmeric is a plant.It used in yellow dye.family (Zingiberaceae).It is also hepatoprotective.been reported.diarrhea.India is now the largest producer of ginger.Medicinal use of ginger: ?Stimulant.Carminative.Given in dyspepsia.Respiratory health ?Rheumatism ?Circulatory system ?Immune system support ?Acne ?Toothache ?Insomnia ?Whole bay leaves have a long shelf life of about one [6] year, under normal temperature and humidity.Tonic effect ?Stimulates general appetite ?Leaves used as a natural insect repellents ??????Leaves are eaten raw or cooked.It is used in Indian clothing.????????????????-????????????-????????????????Stomach ?Kidney and liver function ?Headache ?