

Spices and Condiments

Introduction

India is 'The Land of Spices' and the glory of Indian spices is known throughout the world. International Organization for Standardization (ISO) defines spices and condiments as "vegetable products or mixtures thereof free from extraneous matter, used for flavouring, seasoning and imparting aroma in foods". A **condiment** is normally added to food, typically after cooking, to impart a specific flavour, to enhance the flavour, or to complement the dish

ISO includes 109 spices and the list of spices differs from country to country. According to American Spices Trade Association (ASTA) list, there are 41 items. Spices Board of India has 52 spices under its list. According to Bureau of Indian Standards, there are 63 items under spices / condiments. Spices have been so valued primarily for their ability to make food taste better and sometimes for a perceived ability to make people feel better and fight disease. Spices are even more important today as around globe there is a clamour for tastier and 'spicier' foods. Spices or their extracts are also used in medicine, pharmaceutical, perfumery, cosmetics and several other industries. Their functional properties as antioxidants, preservatives, anti-microbial, antibiotic and medicinal have been well recognised and made use of. Spices have also characteristic, often very attractive colours, which are an important part of their appeal to be used as natural colours in the foodstuffs. The concept of flavour in spices comprises a range of olfactory and tastes perceptions. The constituents responsible for these sensations are the volatile / essential oil and resinous compounds, which are a wide range of different natural organic chemicals and which generally, have little or no nutritional value. These are also widely used for making 'herbal' teas and other medicinal applications.

Export of Spices

Agricultural commodities contribute around 7 % of total export from India and spices contribute around 3% of the total agricultural commodities exported from India. Spices share around 0.27 % to the total export from India.

CLOVE

It is native to Moluccas and introduced to India around 1800 by the East India Company in their spice garden at Courtallam, Tamil Nadu. The world clove is estimated around 63700 t and Indonesia alone accounts for 66 per cent of the world production. The major clove growing regions in India are Kanyakumari ,Nilgiris , Lower pulney hills, Shevroys and Kolli hills in Tamil Nadu, Calicut, Kottayam, Quilon, Trivandrum districts of Kerala and South Kanara and Kodaku districts of Karnataka. The islands of Zanzibar, Pemba (now part of Tanzania) and Indonesia are the major producers of clove in the world.

Scientific Name: *Syzygium aromaticum*

Family: Myrtaceae

Plant part Used: Unopened Flower Bud

Botany

Clove tree is slender, evergreen, up to 2 m tall, conical when young, later becoming cylindrical on cultivation, usually branched from the base. Shoot growth determinant appearing in flushes, forming a dense canopy of fine twigs. Leaves obovate, oblong to elliptic, 6-13 cm x 3-6 .cm, opposite, simple, glabrous, coriaceous, shining with short reddish petioles. Terminal, corymbose, trichotomous, panicle shortly pendunculated and branched from the base with 3-20 flowers/panicle. Flower buds 1-2 cm long. Flowers bisexual, hypanthium fleshy, reddish; sepals 4, fleshy triangular; petals 4; stamens numerous; style short; stigma 2 lobed. Fruit (called mother of cloves) a berry, ellipsoid-obovoid, 2-2.5 cm long, dark red, usually containing one oblong seed 1.5 cm long.



Uses:

Clove is very aromatic, has a fine flavour and imparts warming qualities. In India, it is used as a culinary spice as the flavour blends well with both sweet and savoury dishes. Confectionery, chocolate, puddings, desserts, sweets, syrups and preserves etc. Clove is used for flavouring curries, gravies, pickles, ketups sauces, spice mixtures and pickling spices. It is carminative, aromatic and stimulant used in flatulence and dyspepsia. Clove has stimulating properties and used in betel nut chew and cigarette making.

In medicine, the essential oil is used as an aid to digestion and for its antiseptic and antibiotic properties in toothache. It is an ingredient of many tooth pastes and handwashes. The oil has many industrial applications and employed in perfumes, in scenting soaps and as clearing agents in historical work. The chief constituent of the oil, eugenol, is extracted and used as an imitation, carnation in perfumes and for the formation of artificial vanilla.

BLACK PEPPER

Black pepper (*Piper nigrum*) (Family: *Piperaceae*) is a perennial climbing vine grown for its berries extensively used as spice and in medicine. India is a leading producer, consumer and exporter of black pepper in the world. During 2005-06, 17, 563 tonnes of black pepper worth Rs. 150. 95 crore were exported to various countries accounting for 5.74 % of export earnings among spices. Black pepper is cultivated to a large extent in Kerala and Karnataka and to a limited extent in Tamil Nadu and other states. The crop is grown in about 2, 57, 020 hectares in India with a production of 79,640 tonnes annually. Kerala (94.1%) account for a major portion of production of black pepper in the country and Karnataka contributes around 3.6 %.

Scientific Name: *Piper nigrum*

Family: Piperaceae

Plant Part Used: Fruit

Botany

Piper nigrum is a perennial glabrous woody climber growing up to a height of 15 m or more. The height of the vine depends on the height of the support; it climbs, under cultivation as a monocrop. The height is restricted to 4-6 m giving a columnar appearance. They are trailed on either living or nonliving standards.

The pepper vine has two types of branches, the orthotropic climbing branches and the plagiotropic fruiting branches. The growth of orthotropic branches is vegetative and has monopodial growth habit. After climbing a support, they become woody with thick bark, which forms the central axis of the column. The nodes are swollen and each node has a cordate or ovate leaf. At each node, there may be 8-15 short adventitious clinging roots, which adhere firmly to the support while climbing. At the axil of each leaf there is an axillary bud, which can develop into plagiotropic branches, which produce flowers and fruits. Both types of shoots branch but only orthotropic shoots produce further climbing shoots with roots at every node, which are used for propagation of pepper vines. The sympodially growing fruiting branches when rooted and planted grow into short black pepper bushes.

A mature pepper vine has 10-20 main adventitious roots, 2-3 m long from the base of the stem and there is an extensive mat of surface feeding roots; about 80-90% of the feeding roots are in the upper 40 cm of soil.

Leaves are simple, alternate and often unequal sided. Leaves are coriaceous, dark green and shiny above, pale and gland dotted below, cordate to ovate in orthotropic shoots and ovate to ovate-elliptic on plagiotropic shoots; lamina is entire with 5-7 veins arising from the leaf base or slightly above the base which is round, acute or cordate; leaf size varies with cultivars and may be 3-20 cm or more long and 3-15 cm or more broad. Inflorescence is a filiform, pendant, spike borne opposite to the leaves on fruiting branches. The spikes are terminal in development but pushed aside by the new shoot developing from the axillary bud, so as to make it appear opposite to the leaf. The spikes are 2-17 cm or more long bearing 5-100 or more minute flowers borne in the axils of ovate, fleshy and cupular bracts; cultivated types are monoecious exhibiting great variability in the composition of male, female and hermaphrodite flowers in the spike; high yielding cultivars have as much as 70-100 per cent bisexual flowers indicating that higher percentage of bisexual flowers results in greater productivity.



Black Pepper (*Piper nigrum*)



Uses:

Its value as an essential preservative of meats and other perishable foods was centuries. It is, therefore largely used by meat packers and in canning, pickling, baking and confectionary and preparation of beverages. One of the principal value of the pepper is its ability is to correct the seasoning of dishes. Just before the end of cooling, a final dash of pepper can be used effectively to adjust the flavor. It is an important constituent of whole pickling spice and many ground spice formulae of seasonings for poultry dressings, sausages, hamburger and Frankfurter seasonings. Oil is a valuable adjunct in flavouring of sausages, canned meats, soups, table sauces and certain beverages and liquors. It is used in perfumery and in medicine .

Piperine is used to impart a pungent taste to brandy. It is also being tried as an insecticide. Oleoresin is used for flavouring of sauces, sausages, chutneys etc., on commercial scale, since the use of standardized oleoresin resulted in production of processed foods of uniform quality and flavour. The ancient Aryans considered it as a powerful remedy for various disorders of anatomical system and prescribed it as an effective cure for dyspepsia, malaria, delirium, tremors, haemorrhoids, etc. The Dutch and French housewives use it as an insect repellent and moth killer.

CARDAMOM

Cardamom (*Elettaria cardamomum* (Linn.) Maton) is the dried fruit of a perennial herb. The fruits are picked when they are almost, but not quite ripe. The seeds have pleasant aroma and warm but slightly pungent taste. The spice is used for flavouring curries, cakes and bread and for other culinary purposes. It is popularly known as the 'Queen of Spices' . It is one of the most valued spices of the world. India, Sri Lanka and Thailand are the major producers of the cardamom of the world. Cardamom is also produced in a smaller scale in Laos, Vietnam, Costa Rica, El Salvador, and Tanzania. Till recently, India had the monopoly of cardamom meeting 90-95% of the total world take-off of cardamom, but of late, there is competition from Guatemala and other countries.

Cardamoms occur wild in the evergreen monsoon forests of the Western Ghats in southern India and Sri Lanka. Up to 1800 AD the world's supply came from these forests, with the only cultivation being the partial clearing of the forest around the wild plants. The cultivation of cardamom in India was taken up actively by the erstwhile Travancore Government in 1823 AD. The geographical distribution of the crop in India extends northwards from Tirunelveli (Tamil Nadu) for over 1,000 kms to Sirsi (Karnataka) through the high ranges of Kerala. Considering the width, it is a narrow belt of land spread over the Western Ghats at an elevation of 600 m and above.

During the first century AD, Rome was importing substantial quantities of cardamom India. It was one of the most popular oriental spices in the Roman cuisine. Cardamom was listed among the Indian spices liable to duty in Alexandria in AD 176.

Scientific Name: *Elettaria cardamomum*

Family: Zingiberaecae

Plant part Used: Fruits and Seeds

Botany

Cardamom is a herbaceous perennial plant. A fully grown plant is about 2-4 m in height. The real stem of plant is the underground rhizome. The aerial pseudostem is made up of leaf sheaths.

The leaves are 35 cm long and 7-10 cm wide, lanceolate, with a acuminate tip, dark green, either glabrous or pubescent, soft velvety undersurface. Inflorescence or the long panicles with racemose clusters arise from the underground rhizome, but come up above the soil; clumps 3-4 m in height. Flowers bisexual, irregular, small, pale white, fragrant, alternate, short stalked, solitary at each point of the racemes; flowers open in succession from the base to the top and develop into fruits' calyx is cylindrical and persistent, corolla tube shortly exerted. Fruit is tricolour, globose and rounded; seeds 15-20 per capsule, black when full ripe in capsule and embedded or covered with their white mucilaginous coat.





Uses

True cardamom is used directly as flavouring agent in three forms - whole, decorticated seeds and ground. The spice is also processed on an industrial scale to prepare distilled essential oil and the solvent - extracted oleoresin. True cardamom is marketed predominantly in whole form at international market while trade of decorticated seeds is much smaller and that in the ground form, which is negligible. Grinding is carried out in consuming centres and the manufacture of the essential oil and the oleoresin are undertaken mainly in the western importing countries.

The major use of true cardamoms on a world-wide basis is for domestic culinary purposes either in whole or ground form. In Asia, the spice plays an important role in a variety of spiced rice, vegetable and meat dishes. Indian cardamom adds lingering sparkle to every kind of cooking or dishes, both traditional and modern. International trade in true cardamoms depends, however, on the demand created by specialized applications which have evolved in two distinct markets; namely the Arab countries of the Middle East and Scandinavia. In the former, the spice is traditionally used for flavouring coffee, and in the latter, for flavouring a range of baked goods, including cakes, buns, pastries and bread. In other European countries and in North America, the spice is used mainly in ground form by food industries as an ingredient in curry powder, sausage products, soups, canned fish and to a small extent in flavouring of tobacco. Cardamom cola and instant gahwa, carbonated gahwa, biscuits, Danish pastries, toffees, chewing gum, encapsulated cardamom oil and various breakfast foods are other new products developed using cardamom as an ingredient. The Arabs use it in coffee, the Americans in baked foods, the Russians in pastries, cakes and confectionary; the Japanese in curry, ham and sausage; the Germans in curry powders, sausages and processed meats; the Scandinavians, in coffee and cakes and in countless other dishes. Indian cardamom is low in fat and high in protein, iron, vitamins B and C.

The essential oil finds its main application in flavouring of processed foods, but it is used also in certain liquid products, such as, cordials, bitters, liqueurs, and occasionally in perfumery. Tinctures of cardamom are also made, used chiefly in medicines for windiness or stomachache. Powdered cardamom seeds mixed with ground ginger, cloves and caraway are helpful in combating digestive ailments. In medicine, it is used as a powerful aromatic stimulant, carminative, stomachic and diuretic. It also checks nausea and vomiting and is reported to be a cardiac stimulant also. A good nasal application is prepared by using extracts of cardamom, neem and myrobalan along with animal fat and camphor. Cardamom seeds are chewed to

prevent bad smell in mouth, indigestion, nausea and vomiting due to morning sickness , excessive watering in mouth (pyrosis), etc. Gargling with the infusion of cardamom and cinnamon cures pharyngitis, sore throat, hoarseness during infective stage of flu. Daily gargle with this decoction protects one from flu. Powdered seeds of cardamom boiled with tea-water impart a very pleasant aroma to tea, and the same can be used as a medicine for scanty urination diarrhoea, dysentery, palpitation of heart, exhaustion due to over-work, depression, etc. system and keeps one healthy. Eating a cardamom once daily with a tablespoon of honey improves eye-sight, strengthens nervous It is also believed by some people that excessive use of cardamom causes impotency.

CUMIN

Cumin seed is one of the most important condiments and it is one of the earliest known minor spices used by mankind. It is believed to be native of Egypt and Syria, Turkestan and the Eastern Mediterranean region. The typical pleasant aroma which the seeds possess is due to its volatile oil content. Cuminal or the cuminaldehyde is the principal constituent of the volatile oil.

Scientific Name: *Cuminum cyminum* L.

Family: Umbelliferae

Plant part Used: Fruits

Botany

The plant is semierect attaining a height of 20 to 30 cm. Stem slender and smooth, usually 4 to 5 branches emerge from the base of the plant, giving an umbrella shape to the plant. Flowers, small and borne in compound umbels about 2-3 cms across; calyx five-toothed gamosepalous; corolla consists of five pink-coloured but sometimes white-coloured petals united at base; androecium consists of five stamens; anthers mature earlier than the stigma becomes receptive; gynoecium, two carpels with syncarpous inferior ovary, stigma persisting as distinct stylopodium. The commonly known cumin seed is a schizocarpic fruit-each mericarp with concave inner and convex outer surface contains a single seed embedded in the endosperm.



Uses

The cumin seeds form an essential ingredient of all mixed spices and curry powders for flavouring vegetables, pickles, sausages, cheese and for seasoning bread, cakes and biscuits. The cumin oil is also used in perfumery and for flavouring liquors and cordials. The seeds are also extensively used in Ayurvedic medicines prescribed for stomachache and dyspepsia, diarrhoea and hoarseness of voice. The seeds have diuretic, carminative, stimulant, astringent and emmenagogue properties which make them useful for medicinal preparations.

CORIANDER

Coriander (*Coriandrum sativum* L.) is a native of Mediterranean region and mainly cultivated for its fruits and leaves, which have a fragrant odour and pleasant aromatic taste. The odour and the taste are due to an essential oil, containing of hydrocarbons and oxygenated compounds. It is cultivated in Morocco, Russia, Bulgaria, Mexico, USA, Argentina, and India. China, Romania, Italy, Japan, Hungary, Poland, Czechoslovakia, Guatemala.

Scientific Name: *Coriandrum sativum* L.

Family: Umbelliferae

Plant part Used: Leaves and Seeds

Botany

Coriander, *Coriandrum sativum* L., is an annual herb belonging to the family Umbelliferae. The genus coriander has 2 species, of which *C. sativum* is cultivated. The plant is a glabrous, erect or semierect herb, attaining 20 to 90 cm in height. It is corymbosely branched in the upper part. The lower simple leaves 2.5 to 10 cm long and 2.0 to 7.5 cm wide and pinnate with long petioles with nearly sessile rounded lobes; upper decomposed leaves finely cut linear leaflets. Flowers small and borne in compound umbels, about 4.0 cm across; calyx-gamosepalous, green and 5-toothed; corolla with 5 white or pink-coloured petals of unequal size; androecium's-stamens 5 with spreading filaments. Hermaphrodite or staminate flowers may occur in the same umbel; gynoecium's-two carpel with syncarpous inferior ovary. The schizocarp fruit consist of two mericarps, inner surface of which is concave and outer convex.



Uses

The oil content ranges from 0.10% to 1.00% in the dry seeds. Besides the essential oil, the seed contains fatty oil, which is used for the preparation of soaps of pleasant odour and good lathering property. Whole or ground fruits are a major ingredient of curry powder and are also used to flavour foods, like pickles, sauces, and confectionery. The distilled essential oil from the fruits are used in perfumes, soaps, candy, cocoa chocolate, tobacco, meat products, baked food, canned foods, soups, liquors and alcoholic beverages and to mask offensive odours in pharmaceutical preparations. After distillation of the fruits, the remaining press-cake is said to be a good cattle feed, rich in vitamin C.

Asafoetida

Asafoetida (hing) comes from Gum Arabic or Myrrh, that was used in the anointing (oil) of Jesus (along with Cinnamon, Kusa grass, Bay leaf, olive oil, in the ratio, 2:1:1:2:1.8). Its use has been popular throughout centuries since the early 2nd century BC. It was familiar in the early Mediterranean, having come by land across Iran. Though it is generally forgotten now in Europe, it is still widely used in India. It emerged into Europe from an expedition of Alexander the Great, who, after returning from a trip to northeastern ancient Persia.

Asafoetida is the dried latex (gum oleoresin) exuded from the rhizome or tap root of several species of *Ferula*, perennial herbs growing 1 to 1.5 m (3.3 to 4.9 ft) tall. They are part of the celery family, Umbelliferae. The species are native to the deserts of Iran and mountains of Afghanistan where substantial amounts are grown. The common modern name for the plant in Iran and Afghanistan, is "badian", meaning: "that of gas or wind", due to its use to relieve stomach gas.

Asafoetida has a pungent smell, lending it the trivial name of *stinking gum*, but in cooked dishes it delivers a smooth flavour reminiscent of leeks or other onion relatives. The odor dissipates upon cooking. Asafoetida is also known variously as "food of the devils", "devil's dung", *javoneh-i badian*, *hing*, *hengu*, *inguva*, *kayam*, and *ting*.

The resin-like gum comes from the dried sap extracted from the stem and roots and is used as a spice. The resin is greyish-white when fresh, but dries to a dark amber colour. The asafoetida resin is difficult to grate and is traditionally crushed between stones or with a hammer. Today, the most commonly available form is compounded asafoetida, a fine powder containing 30% asafoetida resin, along with rice flour or *maida* (white wheat flour) and gum arabic.

Scientific Name: *Ferula asafoetida*

Family: Umbelliferae

Plant part Used: Dried latex from the rhizome or tap root of *Ferula*

Botany :

Ferula assa-foetida is a monoecious, herbaceous, perennial plant of the family Apiaceae. It grows to 2 m (6.6 ft) high, with a circular mass of 30–40 cm (12–16 in) leaves. Stem leaves have wide sheathing petioles. Flowering stems are 2.5–3 m (8.2–9.8 ft) high and 10 cm (3.9 in) thick and hollow, with a number of schizogenous ducts in the cortex containing the resinous gum. Flowers are pale greenish yellow produced in large compound umbels. Fruits are oval, flat, thin, reddish brown and have a milky juice. Roots are thick, massive, and pulpy. They yield a resin similar to that of the stems. All parts of the plant have the distinctive fetid smell.



Uses:

This spice is used as a digestive aid, in food as a condiment, and in pickling. It plays a critical flavoring role in Indian vegetarian cuisine by acting as a savory enhancer. Used along with turmeric, it is a standard component of lentil curries, such as dal, chickpea curries, and vegetable dishes, especially those based on potato and cauliflower. Asafoetida is used in vegetarian Punjabi cuisine where it enhances the flavor of numerous dishes, where it is quickly heated in hot oil before sprinkling on the food. Kashmiri cuisine also uses it in lamb/mutton dishes such as Rogan Josh. It is sometimes used to harmonize sweet, sour, salty, and spicy components in food. The spice is added to the food at the time of tempering. Sometimes dried and ground asafoetida (in small quantities) can be mixed with salt and eaten with raw salad. In its pure form, it is sold in the form of chunks of resin, small quantities of which are scraped off for use. The odor of the pure resin is so strong that the pungent smell will contaminate other spices stored nearby if it is not stored in an airtight container.