Major and Minor spices of India

The word spice comes from Latin *species*, meaning a commodity of value and distinction. During their long and fascinating history, spices have often been more valuable than gold or precious stones, and the trade of spices has been an extraordinarily influential factor in history.

Spices are special kind of natural products that offer not only great food/ culinary value in terms of aroma, taste, colour and so on, but also tremendous nutritive and therapeutic value because of their chemical composition.Spices occupy an important position in the Indian culinary scene. They are regularly used by housewives in the kitchen to add aroma and taste to food. The use of spices has never been confined to the kitchen alone.

There are more than 100 different spices grown across the world and India is home to most of them. India's exports of spice extracts have shown spectacular growth attaining over 50 percent of the global market within a short span. Over the past decade, the Indian Spices industry has made quality the cutting edge of its global game plan. India is the largest producer of spices like Anise and fennel, second largest producer of garlic and cardamoms and fourth largest producer of pepper. The country grows 53 of the 75 known spices inthe world. Indian spices are the most sought after spices due to its exquisite aroma, texture and taste. India is not only the largest producer and consumer of spices but also the second largest exporter of spices to the world. India commands a formidable position in the world spice trade with 45% share in terms of volume and 30% in terms of value. The country produces a wide range of spices which can be broadly divided into five categories such as Major spices, Seed spices, Tree spices, Herbal spices and Miscellaneous spices.

Nutraceutical spices

Spices have various effects when used in foods. Not only do they impart flavour, pungency and colour characteristics, they also possess antioxidant, antimicrobial, pharmaceutical and nutritional properties.The 'nutraceutical' value of major spices is well accepted worldwide. Minor spices like curry leaf, pomegranate, camboge (Malabar tamarind), long pepper, tamarind etc. are key ingredients in indigenous systems of medicine and house-hold remedies for various common ailments.

A decade ago, India was exporting spices mainly in bulk form. The Initiation of value addition in the spice sector in the last decade has achieved commendable position in the area of exports. As a result, today more than 60% of the total spices exports are in the form of value added products. The most important of them are Mint products and Spice oils and oleoresins.

International Scenario

The Spices industry has been witnessing phenomenal growth rates both in the international and the domestic market. The growth in this sector can be attributed to the increasing trend towards eating ethnic or oriental foods in the developed countries and the increasing affluence of consumers in Asian, Latin American and Middle Eastern developing countries. In the developed countries, the growth in consumption of ethnic and oriental foods has been spurred by the larger numbers of people travelling abroad and replicating their favourite new dishes at home, the influence of their growing ethnic communities as well as a general trend to eat a greater variety of foods. The shift in the consumption trend towards natural products has also contributed to the increased global demand for spices. The demand for spice derivatives like spice oils and oleoresins is also booming because these products find applications in a number of industries including pharmaceutical, medicine, beverages, food processing and personal hygiene products to name a few. The import market for spices is highly concentrated with the US and EU accounting for a share of over 60% in world's spices imports. The high industrial sector use reflects the growing popularity of ready-to-use spice mixtures. Another reason is the increasing consumption of processed foods and ready to eat dishes, which often rely on spices and herbs to retain and enhance food flavour.

This episode deals with

Major spices

Minor spices

Products of spices

Beneficial potential

Major spices

Pepper

Pepper (***Piper nigrum)***is the most important spices of India which is grown in about 1.8 lakh hectares. It is a perennial climbing wine belonging to the family ***Piperacae.*** The state of Kerala is the original home of black pepper in India. It grows nearly 90% of the country black pepper, with the remaining mostly grown in Karnataka and Tamil nadu. The Indian varieties of pepper were found to of good quality meeting stringent International standards. The bioactive principle in pepper includes,piperine, curcumin and capsaicin. The piperine content increased during maturity of pepper berries.Cftri has carried out detailed study on the production of pepper oleoresin on commercial scale with reference to raw materials, solvents and quality of the final product. Other product include, pepper powder using cryogenic grinding. By this method, a product with higher volatile content, uniform particle size, better colour with reduced microbial load is obtained. Products developed from pepper broadly fall into four categories as black pepper, white pepper green pepper, oil and oleoresin.

White pepper: White pepper is preferred over black pepper in certain preparations such as mayonnaise and salad dressings, by virtue of delicate aroma and absence of black particles.

Based on green pepper, products such as dehydrated green pepper, green pepper in brine can be prepared. Pepper is widely used in Ayurveda and Unani system of medicine for treatment of diseases of respiratory track.

Black Pepper's aromatic, slightly musty odour comes from the volatile oilfound largely in the flesh and skin and its pungent bite comes from thealkaloids and resins found mostly in seeds. The oil goes into perfumes andflavouring. The scaring substance has served many purposes. They havebeen used as carminative, reducing stomach and intestinal gas and have been found to stimulate the activities of the heart and kidneys. Piperine isalso an effective insecticide against houseflies and is also used for sprayingagainst different types of pests in garden.

Small cardamom

The dried ripe fruit of small cardamom (*Elettaria**cardamomum*** **)** plant is the spice which is referred to as 'queen of spice' and highly valued because of its very pleasant aroma and taste.

It is produced in the southern states of Kerala, Karnataka and Tamilnadu. The oil content of cardamom was found ranging from 6-10%.

Large cardamom

Large cardamom **(*Amomumsubulatum*)** is a spice cultivated in the sub-Himalayan regions of North-east, especially in Sikkim. The yield of volatile oil 2.7 to 3.6 % .The pinkish brown colour of the capsule was due to the presence of anthocyanins present to the extent of 0.5 to 1.5 %. Spices are valued for their volatile oil content. The steam distillation of the oil shows the presence of nearly 40 different volatilecomponents, majority of which are terpene hydrocarbons.

Cardamom is aromatic, stimulating and refreshing. It refreshes the mind and is a heart stimulant, is slightly astringent, sweetand little pungent. It relieves gas. Cardamom is a stimulant and it cools thebody in extreme heat and that it aids digestion. Cardamom is used againsturine retention and stomach disorders.

Cumin

Cumin***(Cuminumcyninaum)*** is a flowering plant and is commercially important seed spice, mainly grown in Punjab and Rajasthan. India is the world's largest producer and consumer of cumin seed. It is valued for its aroma and medicinal properties. Cumin one of the important seed spice has the volatile oil content varying from 3-4 %. They are used in cuisines of many different cultures in both whole and powdered form.

Coriander

Coriander (***Coriandrumsativum)*** is widely distributed and is cultivated for its seeds. The seed contains volatile oil ranging from 0.3 to 1.2 %. The light roasted seeds have superior flavor quality as compared to Medium and dark roasted seed.

Fennel

Fennel is a flowering plant species in carrot family. It is indigenous to the shores of mediterrean but have become naturalized in many parts of the world. Fennel is used as a flavouring in some natural toothpaste. The seeds are used in cookery and sweet dessert .In India fennel seeds are eaten raw or sometimes with sweetener.

Minor spices

Garlic

Garlic (*Allium sativum*) is one of the most commonly used vegetable spice cultivated throughout India. A strong sulphuraceousodour is mainly due to the presence of large number of Sulphur compound present in the plant part. The volatile Sulphur compound are not present as such in the intact cells but are formed after rupturing the plant tissue the reaction between the enzyme allinase and the flavor precursors. The volatile content of the fresh garlic bulb is about 0.2%.

A number of products based on garlic includes, Paste, oil, dehydrated powder and flakes, pickled garlic etc. Amongst these products garlic powder is perhaps the most important.

Cinnamon

Cinnamon (*Cinnamomumzeylanicum)*is one of the most important tree spice of India. Cinnamon bark is one of the most popular spice in use. It is principally employed in cookery as a condiment and flavouring material. It is used in the preparation of chocolates, many dessert recipes such as apple pie, doughnuts, and cinnamon buns, as wellas spice candies, coffee, tea, hot cocoa and liquors. Cinnamon is a popular flavorings in numerous alcoholic beverages.

The pungent taste and smell come from cinnamic aldehyde or cinnamaldehyde(about 90% of essential oil from bark)

Tamarind

Tamarind (***Tamarindusindica***) is cultivated all over India , especially in the fruit contains Indian states of Maharastra, Chhattisgargh, Karnataka , Andra Pradesh and Tamil nadu.In most part of India, tamarind extract is used to flavor foods ranging from meals and snacks. Tamarind sweet chutney is popular in India as a dressing for many snacks. Tamarind pulp is a key ingredient in flavouring curries and tamarind rice in south Indian Cousins. Tamarind fruit contains certain health benefitting essential volatile chemical compounds, minerals, vitamins and dietary fibers. It is used in many traditional medicines as laxative, digestive and as a remedy for bile disorder.

Curry leaf

Curry leaf (***Murrayakoenigii***) is an aromatic plant which is valued for its flavor, nutritive value and colour. It is a common practice in Indian culinary to add few curry leaves when butter is converted to ghee, which shows its effect in extending the shelf life of the fat. The leaves retain their flavor even after drying and hence marketed both in fresh and dried form. Maximum concentration of total nitrogen, crude protein, fat, totalsugars, starch and crude fiber were observed in fully matured leaves. The volatile content varies from 0.5to 0.8%.

Asafoetida

Asafetida (***Ferula asafoetida***) an oleo gum resinous exudate, is known for its harsh sulphuraceousodour. It is grown chiefly in Iran and Afghanistan. In India, it is cultivated in Kashmir. The resin like gum which come from dried sap extracted from stem and roots is used as spice. When diluted with the permitted edible carriers, it is known as compounded asafoetida, which finds extensive use as a flavouring in Indian culinary.Products such as locked in asafoetida, encapsulated asafoetida, and oleoresin and tablets of asafoetida are available in the market.

Products of spices

Spice products are essentially products derived from the whole spices. Theyare in the form of powders; extracts like oil, oleoresin, colour or in preservedforms like freeze dried, dehydrated frozen, in brine, in sugar syrup, etc.The most popular spice products are extracts, which are widely used infood, pharmaceutical and toiletry industries. India enjoys a near monopoly inthe field of spice extracts supply. The main spice products include

1. Spice oils and oleoresins.
2. Natural colour and enriched extracts
3. Curry powder
4. Green pepper products

The dehydrated powders can be very well stored for more than six months in rigid containers such as glass or aluminium foil laminate. High density polyethylene (HDPE) and PET

(Polyethyleneterephthalate) containers offer storage life between 3 to 6 months for powders at room temperature.

According to Spices Board, India supplies around 70 percent of the worlddemandCurcumin in turmeric and Carotenoids in chillies are the natural colourcomponent extracted for use as natural colours. The natural colours or theirblends have wide applications from food sector to pharmaceuticals, dyesand cosmetics. India is a large producer of turmeric, and Indian Oleoresin

Industry is one of the largest supply source of a wide range of turmericextracts in liquid and dry form. The range of products offered by Indianindustry covers a wide spectrum of purity for the colour user, providingversatility in application In the last few years India has emergedas a competitive and effective source of Paprika type Oleoresins. India'sproduction of this extract is rising and India aims to capture a fair share ofPaprika Oleoresin market in the years to come.

GarciniaIndica (Kokam) and GanciniaCambogia are two spices widely grownin the slopes and plain of evergreen forests of Western Ghats in SouthIndia. These two spices have distinct medicinal properties for curing obesity.Hydroxy citric acid is the principal component, which is extracted and enrichedfor preparation of pharmaceutical products. Both these varieties of tamarindhave wide applications in pharmaceuticals and therapeutically areas. A rangeof branded anti-obesity drugs available around the world use Hydroxy CitricAcid since it is natural and herbal in origin.

Spice Oils

Spice oils are the volatile components present in most spices and providethe characteristic aroma of the spices. Spice oil is normally extracted bysteam distillation. Spice oils have the major advantages such asstandardization, consistency and hygiene. The standard of quality expectedin spice oil will differ depending on its end uses.Therefore, these oils are custom-made to meet the exact requirement ofthe user. Spice oils are mostly used in food, cosmetics, perfumes andpersonal hygiene products like toothpastes, mouthwashes and aerosols,besides in a variety of pharmaceutical formulation. India is a leading exporterof spice oils to West Europe, USA and Far East.

Mint Oils

India is exporting sizeable quantities of Mint oil. India is now the largestproducer of Mint oil and its derivatives. Because of its cooling effect andrefreshing aroma, Mint oil has wide uses in tooth paste, mouth wash, chewinggum, candy, hair oil, perfume, cigarettes and cosmetic products. In the last few years, mint products have emerged as one of the top exportearners in the spice basket with India overtaking China as the largest producer.The production of the commodity cultivated mainly in Uttar Pradesh, Biharand Uttaranchal has been rising by 10-15% annually. Of the total productionof 35,000 tons, nearly 30% goes for export. Mint oil flavour is the second popular one in the global market after citrus flavour.Mint and mint products constituted the biggest component in the export basketat over 25%.

Oleoresins

Spice oleoresins represent the complete flavour profile of the spice. It contains the volatile as well as non-volatile constituents of spices. Oleoresinscan be defined as the true essence of the spices and can replace whole/ground spices without impairing any flavour and aroma characteristic.

Oleoresins are obtained from spices by extraction with a non-aqueous solventfollowed by removal of the solvent by evaporation. Spice oleoresins guaranteesuperior quality of flavour and aroma. They are complete and balanced,consistent and standardized. They ensure storage stability in the final productand are free from contamination. Custom made blends is also offered tosuit the specific requirement of the buyer. Spice oleoresins are mainly usedin processed meat, fish and vegetables, soups, sauces, chutneys anddressings, cheeses and other dairy products, baked foods, confectionery,snacks and beverages. India enjoys the distinction of being the single largestsupplier of spice oleoresins to the world.Spice oils and oleoresins export was the third biggest component in theexport basket at 13%. While there was nominal growth in volume of spiceoils and oleoresins exports, surge in unit value propelled value realizations
by 21%.

Beneficial potential

Over the years, investigations have been carried out to understand the chemical, biochemical and nutritional and other functional aspectof components of common as well as less common foods and of food adjuncts such as spices.

Spices contribute immensely to taste and flavor of our food. Apart from the traditional use , a host of beneficial physiological effects have been brought out. These includes influence on lipid metabolism, efficacy as anti-diabetics, ability to stimulate digestion, antioxidant property and anti-inflammatory potential.

Turmeric andred pepper and their active principles, curcumin and capsaicin were shown as effective hypocholesterolemia under various conditions. Garlic is also a hypotriglyceridemic agent and its beneficial effect was attributable to its essential oil content.

Dietary curcumin and capsaicin have been shown to have induced the reduction of gallstones in mice. The antilithogenecity of curcumin and capsaicin is due to their ability to lower cholesterol saturation index by altering the bile composition.

Dietary curcumin, capsaicin,piperin and ginger prominently enhanced intestinal lipase activity and also the disaccharidase sucrose and maltase. The positive influences of a good number of spices on these terminal enzymes of the digestive process could be an additional feature of spices that are generally well recognized to stimulate digestion.

More recently, due to an increased interest in understanding the nutritional effects of herbs/spices more comprehensively, several studies have examined the cellular and molecular modes of action of the active chemical components in herbs and their biological properties. Beneficial actions of herbs/spices include anti-inflammatory, antioxidant, anti-hypertensive, gluco-regulatory, and anti-thrombotic effects. One major component of herbs and spices is the polyphenols. Some of the aforementioned properties are attributed to the polyphenols and they are associated with attenuating the metabolic syndrome. Detrimental changes associated with the metabolic syndrome over time affect brain and cognitive function. Metabolic syndrome and type-2 diabetes are also risk factors for Alzheimer's disease and stroke. In addition, the neuroprotective effects of herbs and spices have been demonstrated and, whether directly or indirectly, such beneficial effects may also contribute to an improvement in cognitive function.

Conclusions

Many researchers have attempted to explain why hot spices are pleasant to taste. It seems the burning sensation is the pain of nerve endings on the tongue. This releases endorphins, the

body’s natural painkillers, giving rise to pleasurable and even euphoric sensations.Flowers, leaves, roots, bark, seeds and bulbs (the simplest of natural ingredients) are used in endless combinations to produce an infinite variety of flavors: sweet, sharp, hot, sour, spicy, aromatic, tart, mild, fragrant or pungent. Their tastes and aromas combine to create a kaleidoscope of exotic flavors to delight the plate. It is best to obtain spices in whole seed form and to grind them just prior to use. A number of value added products have been developed for the convenience of the consumer.**Indian spices** offer significant health benefits and contribute towards an individual's healthy life. They add flavor and nutrients to dishes without fat or calories. Understanding the health benefits of each ingredient is key to optimizing home cooked meals for the particular needs of the family.