Health Series

Traditional Family Medicine

Spices

Pappers	– *Kala Marich*
Red Pepper	– *Lal Marich*
Long Pepper	– *Pipal, Piplamul*
Clove	– *Laong*
Cinnamons	– *Dalchini, Tejpat, Brahmi*
Cardamoms	– *Elaichi*
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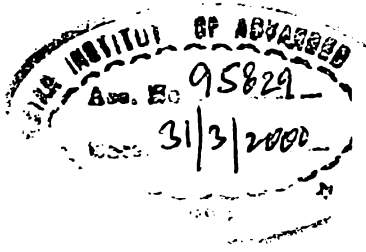
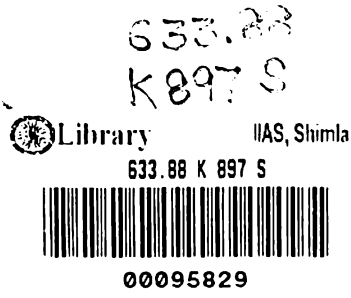
The information contained in these pages has been culled from various sources. This information is solely meant to create an interest about the wondrous qualities of our medicinal plants. On no account should this be utilised in a lay manner. Help of a trained physician is necessary.





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INTRODUCTION

The history of spices, condiments and other flavouring materials for food and as obtained from the plants verges very much on romance. Wars have been fought for them, vast expeditions and colonisations have been undertaken for their sake, the whole history of humanity has taken a different course on account of them and they have been sought after by man eagerly like gold. The craving for spices has urged generations of adventurous men to go to the ends of the world literally, plundering and conquering on the way. India and the Far East have been the main targets and the European powers, the chief actors in this drama. The role that the spices have played in international relations, discovery of new lands and shorter routes of trade, competitive capturing of trading monopolies first and then the subjugation

of the spice producing centres have all been truly astonishing. All of this has been wholly for the sake of the tickling tastes that the spices confer to the foods and the preservative effect they also have. The quest for spices among the European powers of the Middle ages lasting as late as the sixteenth century and the furore they created are paralleled only by their crusades and the wars they fought with the Middle East.

Spices have been used and cultivated however since very ancient times, almost from the beginnings of human civilisations. Their role has always been prominent in all civilisations of antiquity, in India and China, in Babylon and Egypt and in Greece and Rome. Most of the spices originated botanically in the tropical regions of Asia and they have been the first articles of commerce between the East and West. Arabs were the first traders here and they took the spicy products from South India, specially the West coast of Kerala and the Spice Islands by Caravans to Arabia and then to Europe. They had a virtual monopoly, once, of all spice trade. This was challenged and broken by several European nations subsequently who also fought amongst themselves to retain and expand this monopoly or atleast to catch a greater share in the trade. For many years Venice was the leader here and its fame consequently spread far and wide; this for example was the situation when Shakespeare had lived, and praised the bounties of Venice in spice. Portuguese assumed conrol later and held a

virtual monopoly in this trade for two hundred years. The Dutch superceded them soon and held the field for many years conquering what is now the modern Indonesia. Later on and for a very long time the British Empire conquering India as its jewel shared most of the trade in spice along with the Dutch.

The varieties of the uses to which spices have been employed have however shown some decline in modern times. Previously they have been used to add zest and taste to food, as preservaties of food, specially of the non-vegetarian kind, to overcome the odours of bad food and unwashed personal hygiene, in beverages and in commercial drinks and also in medicine—all equally abundantly. At one time spices had been actually used in lieu of hard cash as well. In the commerce of mankind they have always been expensive and in great demand by the rich as well as the poor because of their unique flavouring quality and the scarce availability.

Though the use of spices is not as much at present unlike as in the past, they still command a considerable share of the national budget of even advanced countries like the United States of America. Moreover, the stress is always to import crude drug materials as far as the spices are concerned and not the finished and powdered form in which they are actually used. This is because, adulteration is very easy in the powder form and quite rampant. For instance, for a long time, American pharmaceutical concerns were duped as

regards the supply for turmeric powder. Instead of the powder from the dried horns of the real turmeric rhizome they were supplied with the sticky wheat flour coloured with red chilly powder which also offers a pungent taste and the whole stuff flavoured with an artificial scent. Most concerns naturally therefore insist on the import of crude spice materials alone, through one cannot be very sure whether one can be very certain of securing genuine materials even then. For, because of the great value and the costliness of the spices, the varieties and the extent of adulteration are both widespread and ingeneous. For instance, black pepper grains are often mixed with dried up papaya seeds which resemble them much. Instead of *marattha moggu* buds, - a very important spice for many Indian dishes, dried young fruits of silk cotton tree are just supplied as a better grown variety, since they look bigger! Quite commonly, mere wood shavings, coloured and scented take the place of *keshar* from Kashmir, while faecal matter from birds sometimes replaces *hing* or asafoetida! It is because of these reasons, traders and consumers of spices should exercise extra caution in securing genuine spices. However the essential oils derived from these spices are presumed to be free from such adulterations and are thus willingly imported by foreign countries, in that form.

What exactly is a spice? Chamber's Dictionary defines it as an aromatic and pungent vegetable substances used as a condiment and for seasoning

food and pepper occupies the first place in the examples given. However it is interesting to note that the same dictionary traces the origin of the word spice, from the Latin species, meaning "kinds of goods" in which form alone Europe was familiar with spices for a long time. Spices are not food strictly speaking as they have very little of nutritive value. Their role is to offer a pleasant flavour and aroma to the food and add greatly to the pleasure and taste of eating. They stimulate the appetite and augment the flow of the salivary and the gastric juices. They are thus food accessories or adjuncts. This is solely because of the essential oils they contain and to other aromatic principles they have.

In allopathic medicine, the use of spices is not considered to be as important as they were once regarded as in the Middle Ages. Nonetheless they are much prevalent in Ayurvedic system of medicine and many of them happen to be officially recognised drug materials in the pharmacopea of several countries in America as well as Europe besides many other countries in the Orient. They are used as carminatives (to expel gases from the digestive system), antiseptics (as they kill bacteria) and to mask the unpleasant taste of other drugs. In addition, they do constitute an important ingredient in many industries, such as, perfumery, soap manufacturing and dyes.

The majority of spices of the world are no doubt still obtained from the tropics chiefly from Asia, viz. India and the Far East. But there are some from

other countries as well, for e.g. the grains of paradise (viz. the aromatic seeds of *Aframomum melegueta*) is from Africa, while the tropical America supplies vanilla (from the unripe but fully grown fruits of a climbing orchid *Vanilla planifolia* of its hot moist forests), red pepper or capsicum and all-spice (dried unripe fruits of *Pimenta dioica*, a small tree native to the West Indies and the Central and South America, also called pimento or Jamaica pepper. This is called all spice because its flavour resembles a combination of cinnamon- *dal chini*, cloves, *lavanga* and pepper-all put together). A small number of spices occur in the cooler temperate regions of the Old World; for e.g. star anise (*Illicium verum*) where the starshaped reddish brown fruits and their hard shiny seeds are highly aromatic with a flavour of anise. This is a native of China. Of all the spices of the world however, pepper from India occupies an exalted and universally recognised place. Still, however it is very interesting to observe and speculate upon the following fact. Though pepper is still quite important in India, its native country, modern Indian kitchen relies almost to a hundred per cent for its pungent, hot stuff on red chillies which has come to India only since about two hundred years. Till then Indian cooking had relied for its pungency almost exclusively on pepper. But the culinary art of Europeans and the Americans relie mostly on pepper for its pungency now; infact, the *chutneys* of India are too hot to the West specially because of the red chillies, while they would prefer

the pungency of the Indian pepper instead. This is an interesting case of international understanding in a way!

Classifying the spices however and to propose strict demarcating lines among them is very difficult. All aromatic vegetable products used for flavouring foods and drinks are usually referred to as *spice.* But this is too wide a definition and would also include then the sweet neem or the curry leaves. Others restrict the term spice to the hard or the hardened and preservable parts of the plants that are usually used in a powdered form. *Condiments* are spices or other flavouring substances that have a sharp taste and are usually added to food after it is cooked. *Savoury seeds* are small fruits (like coriander) or seeds that are used whole. In the *sweet* or *savoury herbs* which are also called sometimes as spices, fresh or dried leaves are used (as in sweet neem) to flavour, season or garnish the dishes. *Essences* are aqueoues or alcoholic extractions of the essential oils. The best way to go about in order to group the hundreds of substances that are used to day as spices, condiments, seasoning and flavouring materials is to take into consideration their botanical nature viz. roots, fruits, seeds, leaves, whole herbs and so on. The roots or the underground stems used as spices include gingers, turmerics and sarsaparillas from India and the galangals of China and the angelicas from Syria. The barks are: the Chinese cinnamon (cassia) and the cinnamon from India (*dal chini*).

Spices obtained from flowers or flowers buds are: cloves and saffron (or *keshar*) of India. Spices secured from the fruits are peppers from India, chillies from South America, the star anise from China and vanilla from America. Savoury "seeds" which however are botanically, specialised fruits are the aromatic spices supplied from one family of plants viz. Umbeliferae many of whom are used also as fresh leaves or whole herbs; they are better regarded therefore as seasoning herbs. Coriander, cuminum (*jeeraka*), anise (*sounf*) caraway and the like belong to this category. There are spices obtained from seeds e.g. cardamom, foenugreek or *methi*, mustard, nutmeg. Spices obtained from leaves are illustrated by *tulasi*, *pudina* and sage, thyme, sweet bay and parsley, common in the Mediteranean countries though some occur even in India. There are still a host of other spicy and garnishing materials for e.g. garlic and onion, lavender, lime, poppy seeds, rosemary sesame and so on.

In this book we confine to give an account of a selected few of common spices meaning thereby hardened, preservable plant parts and products, mostly. The list includes the following: pepper, the red pepper or the chillies, cloves, cinnamon bark (*dalchini*), *tejpat*, and cardamom and nutmeg. The seasoning herbs which are also spices are dealt with, in a separate book in this series while ginger and turmeric form the subject matter of yet another separate book.

The value of spices comes from the aromatic and the essential or the volatile oils they contain. Aromatic oils are used by man in two broad ways i.e. as perfumes or as spices. Both are also medicinal in their respective fields, the former are mainly applied as scents and the latter constitute food adjuncts and also preservatives. The oils are always present in small quantities for e.g. just 16 to 18 per cent in cloves. Chemically the oils are combinations of many substances such as terpenes, phenols, alcohols, acids, esters, aldehydes, ketones and nitrogen and sulphur compounds. India is fortunate in having a large variety of climates, altitudes and soils to support a variety of spices. Besides, many exotic plants can also be grown here. The botanical families that offer spices are also much varied viz. Piperaceae (e.g. pepper), Lauraceae (e.g. *dal-chini*), Myristicaceae (e.g. nutmeg), Myrtaceae (e.g. cloves), Umbeliferae (*eg. jeeraka* or cumin seeds) and Zingiberaceae (e.g. ginger and turmeric).

Though spices are used mainly for the special taste and aroma they confer to the food with which they are combined, they also have their value in nutrition in that they contain all the three components (viz. proteins, fats and carbohydrates) that release energy in the body ultimately and also the mineral salts. They also have their individual energy value which is technically termed the caloric value.

The following table provides a comparative estimate of the nutritional value (viz. percentage of

the first four and the caloric value) of some of the common plant products used as spices.

Spices	*Proteins*	*Fats*	*Carbo-hydrates*	*Mineral salts*	*Caloric value*
Black pepper	11.5	6.8	49.5	4.4	305
Chilly	4.8	2.7	27.3	1.8	153
Cloves	5.2	8.9	47.9	5.2	293
Cardamom	10.2	2.2	42.1	5.4	229
Ginger	23	0.9	123	1.2	677
Turmeric	6.3	5.1	69.4	3.5	349
Coriander seed	14.1	16.1	21.6	4.4	288
Cumin seeds	18.7	15.0	36.6	5.8	356
Asafoetida	4.0	1.1	67.8	7.0	297
Garlic	0.3	0.1	29.0	1.0	142

A. PEPPERS

Pepper has been the most famous of the Indian spices with a definite record of having been under continuous cultivation since last two thousand years if not much longer. Chamber's Dictionary of English derives the history of the term pepper along the following stages: *pipor* of Old English, *piper* of Latin, *peperi* of Greek and *pippali* of Sanskrit. This is the dried berry of the pepper plant, entire or powdered (black pepper) or with the outer parts removed (white pepper). Ayurvedic authors however do not distinguish among the

black and the white pepper this way. What they call as *shweta maricha* is an entirely different article and not a spice at all; this is the seed of *sahjan* or *Moringa pterygosperma* or the drumstick tree-this seed resembling no doubt the berries of pepper in a way though much larger, winged and white. English authors recognise a few more "peppers" besides black pepper (*Piper nigrum*): a long pepper which is the fruit of *P. longum*, a Jamaican pepper which is allspice, an Ethiopian or a Negro pepper (from a plant called *Xylopia*), a red pepper or cayenne pepper or chilly and also a peppermint (an aromatic and pungent species of mint - *Mentha piperita*), a pepper grass (a cress of the genus *Lepidium*) and a pepper wort (*L. latifolium*). They are all pungent, aromatic substances, used as food adjuncts or spices and resembling pepper in flavour, more or less. Of all these, pepper is the most famous and lends its name to all of these other pepper like plants. There is a sweet pepper or a bell pepper also which is the name given to a variety (*grossum*) of *Capsicum* where the pungency is restricted to the seeds only, the fruits being the mildest of the chillies. This is paprika of the Europeans or Capsicum, a common vegetable of Indian markets even, now.

Here, we restrict to the several Indian species of the genus *Piper*.

Members of this genus are mostly shrubs, rarely herbs growing erect or mostly climbing; they are often glandular and aromatic over the whole of the

aerial parts. Branches have swollen nodes. Leaves are entire i.e. undissected, their two sides along the midrib are often unequal. They mostly have stipules viz. reduced leaf like structures at the base of the stalk of the leaves and these stipules assume various shapes. Flowers are mostly dioecious i.e. male and female flowers occurring in two separate plants. They are minute and clustered in spikes, which are elongated, rather cone like inflorescences bearing a series of stalkless flowers, the older below and the younger, towards the apex. Flowers occur in the axil of bracts or leaf like structures in the region of the inflorescence. Bracts have many diverse shapes (cup like, flat etc) aiding in identification. Fruit is a small ovoid or globose one seeded bery or fleshy fruit. The genus contains about 700 species distributed in the Tropical regions of the world. There are six species in India that have assumed considerable importance. Their quick identification is added by the features of the spikes and the leaves as shown in the artifical key given below.

Medicinally, the genus is an energetic stimulant, a diaphoretic inducing profuse sweating and a carminative, capable of expelling gases from the digestive system, chiefly the bowels.

Many species are used medicinally in China. Some new and important alkaloids that serve as the active principles of the medicinal plants have been isolated from a few species. Examples are: jaboridine from *P.reticulatum*, piperine from

P.chaba, *P.longum* and *P.nigrum*; and, piperovatine from *P.ovatum*.

Several species are officinal in many countries i.e. recognised in their authorised lists of medicinal drug materials or Pharmacopeas.

Kala marich or black pepper and also the equally famous *pan* or betel leaf, both belong to the genus *Piper* of the family of plants Piperaceae. This is a very large genus of many species growing in the several subtropical and tropical regions of India in a state of nature or as intensively cultivated commercial crops. In spite of the great antiquity of the use of black pepper in India, it is very significant to note that as it exists in India even now, some of these species are still *unexplored much less, exploited for their commercial use.* It has been said that man could have chosen many other species of this genus which could have proved better than the cultivated pepper and betel leaf, if selected and propagated. These other lesser known species of *piper* therefore still constitute *potential wealth of our forests* that ought to be respected, conserved, explored and utilised when the need arises in the future. It is therefore useful to have some idea of all of these major species of this genus. It is also relevant to know as to how can one distinguish them from one another. This is possible by applying the following key.

A Key for Identification of a Few of the Species Under the Genus Piper

A. Spike (i.e. the elongated flower cluster, with stalkless flowers) are solitary. Flowers are male or female occurring in two separate plants. Bracts (i.e. the small leaf like structures below the flowers) are orblike (i.e. circular) in shape or peltate viz. their stalks are attached on the middle of their back. Fruits are very small and arranged in dense cyclindrical or rarely globe like spikes.

I. Leaves are quite hairless and smooth. (exception very slightly hairy in *P.sylvaticum).*

a. Lower leaves have a long leaf-stalk; their shape is ovate, heart like or cordate; upper ones are narrower, oblong-heart shaped, stalkless and ensheathing the stem or they are amplexicaul.
P.longum. The long pepper.

b. Lower leaves have very short stalks; these are rather leathery; in shape, they are oblong, ovate or lance like. Their tip is acuminate or long, pointed and drawn out. The leaf blade is 3-5 nerved at the base. *P.chaba*

c. Leaves are membranous and with long stalks; they are broadly ovate, or ovate-cordate; tip, acuminate. *P.sylvaticum*

d. Leaves are large, leathery and stalked. Shape of the leaf blade is obliquely ovate-oblong or rounded, ovate cordate:
P.betle, the *pan* or the betel leaf.

e. Leaves are thin, dark green, ovate, deeply, equally (i.e. not obliquely) cordate. The basal lobes of the leaf are round. There are 7 nerves radiating from the base. *P.sarmentosum*

II. Leaves are more or less hairy (i.e. pubescent)

P. aurantiacum

B. Spikes are solitary. Flowers are either male or female, occurring in two separate plants, rarely polygamous, i.e. all sexes (male, female and neutral) present together.

Fruits form loose and interrupted spikes. Fruits are stalkless.

I. Leaves are 5-9 nerved.

P.*nigrum*, the black pepper *kala marich*,

II. Leaves are 7 nerved, near the base.

P.attenuatum.

All of these are of values as spices, actually or potentially and in addition they also have varied medicinal uses. More interestingly, many of our regional languages recognise them very much, by giving them special names. We shall therefore consider every one of them in some detail.

1. Piper longum (the long) Linn.

Names

This has many names in Sanskirt: *Chanchala, chapala* (the fickle); *pippali mulam; granthika* (referring to the knotty root); *pippali; magadhi, magadodbhava, vaidehi* (all, meaning, from Bihar).

In English, it is Long pepper. Two parts of the plant are in use: (i) the whole inflorescence or spike as such, with many individual grains on it - this justifies the term Long pepper unlike as in Black pepper or pepper, where it is the individual grains that are so sold and used; (ii) the root of the plant, which receives the trade name *pippali mul* (Pepper root).

In Bengali, it is *piplamul, pipli;* in Chinese *pipo;* in Gujarati, *pipli;* in Hindi, *gaz pipli, pipal, piplamul;* in Malyalam, *chapala, pippali, tippali;* in Kannada, *pippali, tippali;* in Punjabi, *darfilfil, pipal;* in Tamil, *pipli, tippali* (the fruits); in Urdu *pipul.*

Botany

Root stock is erect, thick, jointed and branched. Numerous stems arise from this; they are ascending or prostrate (i.e. lying along the ground), stout, cylindrical, thick above the nodes and finely hairy. Leaves are numerous, lower ones broadly ovate, base, very cordate and with broad lobes. Upper leaves are oblong, oval, cordate. Tip of the leaf blade in all, is subacute and the margin is entire. Leaf blade is thin, non-hairy, smooth, much like betel leaf but smaller and inflated like a bubble at the base; with net like ribs sunk above and raised beneath, dark green, shining above, pale and dull below. Stalks of the lower leaves are stout; but, these are short or none in the upper leaves. Fruit is very small, ovoid, completely sunk in the solid fleshy spike which is why the part is

sold as such unlike in the black pepper where individual grains are easily separable. The spike is ovoid, oblong, erect, blunt, blackish green and shining.

This is found in the hotter regions of India, Sri Lanka and Malaysia. It is indegenous to most Eastern and Southern India and Sri Lanka. It is also well cultivated in Bangladesh.

Medicinal Importance

This is a highly reputed drug in Ayurveda. The parts used are immature fruits (unripe spikes) dried in the sun, stems and root (which is *piplimul*). Constituents are: resin, volatile oil, starch, gum, fatty oil, inorganic matter and the characteristic oil piperine 1 to 2 per cent.

The root is knotty and pungent, *ushna* in action, stomachic or good for stomach, laxative, destructive of intestinal worms and carminative. It adds zest to eating, improves appetite and is useful in bronchitis, abdominal pains, diseases and enlargement of the spleen, tumours and also ascitis (dropsy of the stomach). Its excessive consumption however causes *pitta dosha* or biliousness.

The unripe fruit is sweetish, cooling and useful in biliousness. The ripe fruit is sweetish, pungent, hot, stomachic, aphrodisiac (exciting sex urge), laxative and beneficial in diarrhoea and dysentery. It is also helpful in *vata* and *kapha* aggravations,

asthma, bronchitis, abdominal complaints, fevers, leucoderma, urinary disorders and jaundice.

Yunani physicians use the root and fruit in palsy, gout and lumbago. The fruit according to them is bitter, hot and sharp in taste and is carminative, stomachic, emmenagogue (correcting menstrual disorders), aphrodisiac, digestive and a general tonic. It is also used in liver complaints, joint pains, lumbago and night blindness as well as in labour. It is also employed in paralysis and epilepsy.

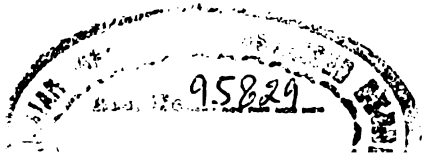
In Kerala an infusion of the root is prescribed after childbirth to cause an expulsion of the placenta, almost as a regular household remedy. As an *alterative* drug viz. one which is capable of altering important vital functions desirably, the procedure prescribed is rather unique and is designated as a progressive method *(vardhamana pipal)*. An infusion of three long peppers is to be taken with honey on the first day, then increase the dose by three peppers every day for ten days, so that on the tenth day, one dose will be that of thirty peppers. Administered thus, the drug will prove a very valuable alterative tonic for patients of paraplegia (one sided paralysis), enlargement of the spleen and other abdominal viscera (the soft parts) and also chronic, long standing cough. As an alterative tonic it is more powerful than black pepper.

Long pepper is an ingredient of many irritating snuffs. Boiled with ginger, mustard oil, butter milk

and curds it forms a beneficial liniment (thin ointment) that is very beneficially used in sciatica (neuritis or quite a painful inflammation of the nervous tissue in the great sciatic - hip region - nerve that passes down the back of the thigh) and paralysis. Roasted fruits are ground and given in the Konkan areas with honey for rheumatism. These are also given with black pepper and rock salt (2 parts long pepper, 3, of black, and 1, of salt) in colic or twisting pains of the abdomen; dose is one *tola*. The dried immature fruit and the root are extensively used as a decoction in chronic bronchitis accompanied with cough. Relief obtained this way is gradual but certain.

Pipal has diverse uses when administered along with various other drugs. *Pipal* is given along with honey in cough, breathing difficulty and fever; this also augments intellect, virility and digestive ability. Given with jaggery, it is beneficial in fever, diseases of the heart, indigestion, tastelessness and worm infection. The powders of *pipal* and dry ginger are together given with jaggery to ward off shooting pains of the stomach, swellings and indigestion. The juice of *pipal* and that of neem leaf are together boiled and used as a nasal drop with beneficial results in cases of epilepsy. Drinking a decoction of *pipal* with honey wards of fevers due to *vata* and *kapha*. Taking its powder with honey cures tendency to fits.

The root or *pipalmul* is stimulative to digestion, hot, dry, light, promotive of *pitta* but destructive of *kapha* and *vata*. This is curative of tuberculosis



and is beneficial in the disease of spleen and worm infection.

In general, just as black pepper is specific to digestive upsets, *pipal* is rather specific to the diseases of the lungs and the uterus. The latter's use is beneficial in the diseases where *kapha* and cold predominate. If labour is delayed greatly, a drink of *pipalmul* and *iswarmul* (root of *Aristolochia bracteata*) added with *hing* proves much effective. A cold infusion of *pipalmul* helps in the ejection of the afterbirth.

Ayurveda refers to three varieties: *londi* or *choti pipal* (the smaller), *sugandh pipal* (the fragrant) and *badi pipal* (the bigger); the first is the best and enters as an ingredient of the famous three pungents (*trikatu;* the other two are dry ginger and black pepper.)

Ayurvedic lexicons however recognise 4 varieties: *pippali* also called *magadh*, grown in South Bihar; *gaja pippal* (identity, is still doubtful though many consider it as *chavya;*) *sinhalee* - an imported one, from Ceylon, Singapore and Zanzibar—this is very strongly pungent; and, *vana pippali* growing in a state of nature in Assam, Bengal and Konkana - this is *Piper sylvatica*. This last particular creeper is a very long climber, leaves are like *pippali* but a little bigger. Fruit is 3/4 to 1-1/2 inch and round and less pungent; this is much used in Bengal and is often called Bengali *pippali*. There is another variety called Navasari (or Gujarati) *pippali* whose fruits are bigger than in the Bengali "variety" and

yield a powder that is beautifully green. In current use however there are only two *pippali* varieties: the bigger one which is imported (Sinhalese) and the smaller, which is produced in our own country. It is interesting to note that import trade in *pippali* is of considerable magnitude.

Specific Remedies

Pippali is a very favourite drug of Ayurveda and there are many remedies sanctioned by traditional use; quite a few of them are common household remedies. A few of them are given below. A general guideline is that the old long pepper is more effective than the fresh one medicinally.

Pippali is excellent in the affections of the lungs. It is very effectively used in cough and also for the expulsion of phlegm in consumption and many other respiratory disorders. There are many recipes for this purpose. Mix its powder with an equal quantity of the ashes of peacock's feathers and give this with honey as an electuary repeatedly; this will cure powerful hiccup, very grave cough and incurable vomiting. Fry *pippali* in gingily oil, grind and add an equal amont of sugar candy. This is to be taken in a dose of 1 to 2 *rattis** in a decoction of

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* The modern equivalents of the traditional units of the measures indicated in the text henceforth are as follows:

1 *ratti* = 1 *gunza* (the weight of one seed of *Abrus precatorius* or *gunza* plant); 8 *gunzas* = 1 *masha*; 10 *mashas* = 1 *tola*; 24 *tolas* = 1 *ser*; 1 *pau* = 1/4 *ser*; 1 *tola* = 10 grams.

kulatthi (horse gram); this is specially effective in coughing due to *kapha*. A recipe useful in all coughs is to mix the powders of *pippali* and alum in equal proportions, thin this in the juice of *dhattura*, make pills of *ratti* size and take one pill along with honey morning and evening.

For all types of fever, take 5 *tolas* each of *pippali* and *tulasi* leaves, one *tola* each of fresh ginger and clove, grind them all together with water, make pea sized pills, dry in shade and store. Two pills are to be taken with honey by licking, three times a day. This cures cough also. Dip *pippali* in *tulasi* juice seven times, then dry, powder, strain and store. Mix 1 *tola* of honey with 4 *mashas* of this powder and let the patient lick it up 4 times a day followed by a drink of 5 *tolas* of hot water. This will remove all fever. For chronic fever use goat's milk instead of hot water, or cook *pippali* in goat's milk, dry and powder. Take 2 *mashas* of this powder, 1 *masha* of white cumin powder and 6 *mashas* of sugar candy. Give this mixture in 5 *tolas* of hot goat's milk. A month's treatment this way will destory any type of chronic fever.

Pippali is much used in digestive troubles. Indigestion will not occur at all if one keeps taking its powder mixed with honey after the meals as a routine. If there is flatulence (i.e. bloating of stomach due to gases) and constipation, take 4-6 *rattis* of its powder, add 2 *mashas* of *saindhav* black salt and mix both in 10 *tolas* of butter milk. This is to be given 2 to 3 times at an interval of

one hour. This will cause flatus, remove distress and restlessness, cleanse the bowels and restore normal health.

On the reduction of shooting pains, *pippali* has a decisive role. Take 30 *tolas* of *pippali* paste (*kalka*), 7 *sers* of its decoction, 2 *sers* of ghee and cook in 2 *sers* of water till ghee alone remains, cool, filter and store. Dose is 1 *tola*—in 2 *tolas* of honey. This will destory any terrible pain of digestive tract. Powder equal parts of *pippali*, black pepper, *manakka*, liquorice *(mulethi)* root and dry ginger. Cook in cow's butter and give this as a snuff. This is effective in head-ache. A simpler recipe is to snuff a mixture of *pippali* powder and *saindhav* salt. Keep *pippali* powder mixed with honey and ghee in the mouth below the teeth; this is a much recommended drug for severe tooth ache. Using a tooth powder of *pippali*, *jera* and *saindhav* salt cures tooth ache, swelling of gum, and loose teeth. For aching ears, a fumigation of *pippali* powder on live coals and taken in through a tube proves much relieving.

2. Piper chaba Hunter

Names

In Sanskrit, this is called *chavana*, *chavi*, *chavika*, *chavya* (all referring to the chewable drug); *gandha nakuli*, *katuka*, *katu kapini* (the bitter); *kola*, *kolavalli*, *kolavallika; krikara; kutila saptaka; tejovati* (pungent); *vashira*.

In Bengali it is *chai, choi, gacha, pahari pipal;* in Hindi *chab, chavi;* in Marathi, *chavala, miravela;* in Kannada, Tamil, Malayalam, *chavya, chavyam.*

Botany

This plant is a climber, smooth, non-hairy and rather fleshy. Leaves are oblong, ovate or lanceolate (i.e. somewhat like a lance) and the tip, acuminate (i.e. drawn out like a tail). Base is round, cordate and the two halves are unequal. Nerves are 3 at the base, with 2 pairs starting from the midrib. Fruiting spikes are cylindro-conic in shape, widest at base, bright red. Fruits are drupes, very small, globose and well sunk in the flesh.

This is cultivated in several regions in India and also Malaysia. The fruit is the long pepper of European Commerce. Its present trade centre is Singapore.

Medicinal Importance

This plant may well form a good substitute for *P.longum* which is *pippali* discussed above. The root is alexiteric (i.e. counteracting to poison) and is also useful in asthma, bronchitis and consumption.

The fruit is pungent, hot, destructive of worms, expectorant (expelling phelgm by cough) and carminative. It improves appetite and increases relish in the food. It is useful in asthma, bronchitis, fever, piles and pain in the abdomen and the anus.

The fruit is a stimulant and is also used in haemorrhoidal afflections i.e. where there is a tendency of haemorrhage or blood flow. It is sometimes used in coughs, colds and throat infections; in colic or twisting pains of the stomach and in renal or kidney diseases; and tympanites or the inflammation of the ear drum. Its properties are similar to *pippali*. Yunani physicians consider the snuff of this fruit as a specific drug in epilepsy and hysteria.

3. Piper sylvaticum (of the Forest) Roxb.

Name

In Bengali, this is *pahari pipal* or the hill pepper.

Botany

The plant has a perennial root. Stem or rather its branches are creeping on the ground or rooting on trees very much like Ivy plant and as it is the case in most of the East Indian species of pepper. All the young parts look as if polished well. Leaves are alternate and stalked; base cordate (i.e. heart shaped) but both the lobes are equal in size. The tip is obtuse and the leaf blade is 5-7 nerved and smooth. Flowers are either male or female and arranged in spikes and borne on two different plants.

This plant grows in the upper and lower Assam, Bengal and Burma.

Medicinal Importance

In Bengal, the fruit is employed as carminative and also as a pacificatory drug. Roots are presumed to be an antidote to snake poison.

4. Piper betle Linn.

Names

In Sanskrit, this has many names *bhakshya patra* (edible leaf); *bhujanga lata, bhujanga valli, naga valli, nagini, naga vallika* (all, meaning climbing like a snake); *tambula valli tambuli* (a creeper used as *pan*), *vitika* (garden grown).

In English it is Betel leaf vine.

In Arabic, it is *tambol*; in Bengali, *pan;* in Gujarati, *nagar vel, pan;* in Hindi, *pan, tambuli*; in Kannada, *vilyada ele;* in Tamil, *vettele* ; in Urdu, *pan.*

Botany

The plant climbs up its support vigorously by short adventitious root-lets. Stems are semiwoody, much thickened at the nodes with its young parts completely smooth and non-hairy. Leaves are large, broadly ovate, somewhat cordate at the base and often slightly unequal; the tip is shortly acuminate or acute and the margin, entire but often undulate or wavy; leaf blade is usually 7-nerved, smooth, non-hairy, thick, bright green and shining. Spikes of the flowers are dense and cylindrical. Fruit is produced very sparingly and

they are quite sunk in the fleshy spike which is pendulous or hanging down.

This is well cultivated in the hotter and the damper parts of India and Sri Lanka, for the sake of the leaves which are very common articles of use- habitual all over India, Sri Lanka and Malaya. It is probably a native of Java in Indonesia. Parts used medicinally are leaves and fruit.

Medicinal Importance

Leaf is pungent, bitter, sweetish and acrid in taste. It is heating, carminative, stomachic, destructive of worms, laxative, tonic and an aphordisiac. This is useful in *vata* and *kapha doshas*. It removes foul smell of the mouth and is beneficial in bronchitis and also elephantiasis of the leg. This should not be taken by patients of eye diseases, leprosy, thrist, alcoholism, ashtma and those that have tendencies towards a loss of consciousness, for e.g. epileptics. This is how Ayurveda evaluates this famous plant.

Yunani Physicians consider that the leaf has a sharp taste and a good smell; it improves taste and appetite and is a tonic to the brain, heart and liver. It strengthens the teeth, lessens thirst, clears the throat and is healing to wounds and a styptic (i.e. checks bleeding) as well.

In Konkan, the fruit is employed with honey to cure cough and in Orissa the root is said to be used for preventing child bearing. The juice of the

leaf is used to cure eye diseases including night blindness. The volatile oil of the leaves has been successfully used to treat cold, running nose and also as an antiseptic. In Cambodia, the ground down fresh leaves are used to prepare lotions and baths for patients of protracted fever, enlarged glands and the inflammation of the lymphatic regions. In Philippines, leaves are eminently used in children's diseases such as indigestion, colic, diarrhoea, pulmonary catarrh and laryngitis or the inflammation of the voice box.

Constituents

Pan chewing specially after meals is an extensive habit in India and the plant is under intensive cultivation since long. There are thus numerous local varieties differing in the size, shape, texture, and taste of the leaves and many local preferences. They have a light yellow aromatic volatile oil (betel oil; 4.2 per cent) of a sharp and burning taste, and a chavi betol, another active principle that can be isolated. The oil is richer in tender leaves treated with caustic potash; it yields chavicol, a powerful antiseptic, twice as strong as eugenol. It is this that causes the characteristic odour of the leaves and the oil. Leaves also have an alkaloid araken with properties similar to the famous cocaine. The quality and the character of the essential oil determines the value of the leaf. The best oil is that which contains as large an amount of phenols as possible. Those varieties of leaves where much terpene exists in the oil are pungent and coarse.

Action

Pan chewing gives a sensation of warmth and well being in mouth and stomach. It produces a primary stimulation of the central nervous system followed by a type of inebreity or intoxication in large doses. As the leaves have large contents of a digestive enzyme called diastase, they help much in the digestion of starch. But persons not used for pan experience a disagereable, acrid and burning taste and a feeling of constriction of throat immediately; their taste perception is blunted and even slight sores on the tongue and throat may occur. But persons habituated to *pan* and deprived of it, subsequently are likely to suffer from severe indigestion.

Medicinal and Other Uses

Fresh leaves are chewed in the form of packets and with betel nut, chunam and a varied collection of *masalas*—all forming almost an art. This sweetens the breath, improves voice quality, removes foul smell of the mouth and increases salivation. In India this also serves as a vehicle for tobacco and coccaine taking by those habituated to them.

In many ailments specially of children however, betel leaf is a beneficial drug. A few such illustrations are given below.

A liquid extract of the leaf is used in doses of 10-30 minims in catarrhal inflammation of throat, voice box and bronchi and also cough, breathing

difficulty and indigestion that is so common in children. This is also given internally in snake bite. Essential oil of the leaves is also used similarly. For cold and pain in the chest, oil is sprinkled over the leaf and this is then tied on the chest. If this is tied over the belly, the gas trouble will get removed.

This is also useful in bronchitis, difficulties of breathing and coughs specially of the infants and the young children. For congestion and other affliction of the liver also this is recommended. Instead of leaves, a warm poultice of 2 parts of leaf juice and 1 part of hydrated, slaked lime is applied as the best remedy for sore-throat, laryngites and bronchites and over enlarged glands. Leaves warmed by fire and placed in layers over the breasts check secretion of milk and will also remove glandular swellings. Tender and fresh leaves smeared with ghee or medicated oil are commonly used to dress blisters and inflammed wounds. Gargling with warm juice of this leaf is useful in diptheria of children. Juice of the leaves forms an ear drop or an eye drop for painful ears and eyes, respectively.

Internally, juice with honey is beneficial in coughs, breathing difficulty, deranged phlegm and indigestion common in children.

Leaf juice is given with milk in hysteria. Leaves given as a syrup and with spices, in a dose of one ounce and three times a day is useful in general weakness. This is also an esteemed aphrodisiac, increasing the urge of sex.

Roots also have their uses. In Orissa, these slender roots with black pepper are used to cause sterility in women. Singers chew the roots to improve their voice.

Tender stalks of leaves are dipped in castor oil and introduced into the rectum of the children suffering from constipation.

The general activities of the betel leaf can be summarised as follows:

It creates a sense of delight to the heart and also an amount of heat in the body. It dissolves swelling, expels *kapha* or phlegm, regulates *vata*, strengthens liver and stomach, causes salivation, strengthens the gums and removes bad smell from the mouth. As it causes salivation, this removes the dryness of the mouth and quenches thirst to some extent. Normally it is chewed with *katha*, lime, betel nut, cardamom, *saunf* and the like. Consequently it offers a desirable aroma apart from removing the foul smell, strengthens the gums and also cures any afflictions there. In cases of kidney enlargement and diabetes, chewing pan is a beneficial way of checking thirst. As it heats up the stomach, the gastric functioning is stimulated. Because of this reason and as it also expels phlegm, it is advisedly employed in cases of cough and respiratory or breathing distresses. This is particularly useful in rectifying hoarseness of voice due to cold; during this condition, the betel leaf is best taken along with liquoice (*mulethi*) root.

Betel leaf is deleterious to persons of hot constitution.

White cardamom is however the agent that would ward off such deleterious effects of betel leaf.

Modern system of medicine considers betel leaf as an excellent stimulant, a good digestive, and an efficacious phlegm destructive agent. This also destroys swellings and oedema, stabilises and kills pain and heals up the wounds. Its juice is an excellent antiseptic. It is presumed that this is much better an antiseptic than even the famous carbolic acid. It is a very useful medicine in all distresses where *kapha* or phlegm is the predominant factor. The juice of the leaf is administered as a drug in cases of asthma, bronchites and inflammation of the respiratory channels in general. Gargling with its juice in warm water is remedial in cases of diptheria.

5. Piper nigrum (the black) Linn.

Names

This has many names in Sanskrit: *dharmapattana, dharmavarttana* (coming from Dharmapuri area now a district of Tamil Nadu?); *kapha virodhi* (countering *kapha dosha*); *katuka,* (pungent); *shyama, krishna* (the black); *maricha, mrishta; kola, kolaka; sarvahita; vallija, vellija* (creeper born); *yawaneshta, yavana priya* (liked by *yavanas*) and so on. In English, this is the Black

pepper or Pepper. This is the most famous of the peppers. In Bengali, it is *gol morich, kala morich;* in Gujarati, *kala mari, miri;* in Hindi *choca mirch, gol mirch, habush, mirch;* in Marathi, *kalimirch, mire;* in Kannada, *menasu;* in Tamil *milagu;* in Telugu *marichamu.*

Botany

The plant is a stout, smooth and non-hairy climber. Stems are smooth and cylindrical, sparingly rooting and much thickned at the nodes. Leaves are leathery, broadly ovate, acuminate, smooth, hairless, 5-9 nerved, the nerves immediately above the base are usually alternate; leaf base is usually rounded and more or less oblique. Flowers are male or female; they occur in separate plants but sometimes the flowers are polygamous, viz. male, female and neutral, all occurring together. Fruit is globose, at first yellow or greenish yellow but becoming attractively red when fully ripe.

This is a perennial climbing shrub indigenous to the west coast of South India.

Parts used are the dried unripe fruit - the black pepper or the *kala marich.*

Medicinal Importance

Ayurveda praises this drug very much. The fruit is pungent, bitter, hot and destructive of worms. It is useful in *kapha* and *vata doshas*, asthma, pains

in general, diseases of the throat, piles, urinary disorders and night blindness. It increases biliousness, brings in sleep and also epileptic fits.

Yunani physicians consider the fruit as having a sharp, pungent and slightly bitter taste. It is carminative, aphrodisiac, purgative and counter acting to poison and is useful in tooth ache, inflammation in general, pain in the liver and the muscles, diseases of the spleen, leucoderma, eructations or belching, lumbago, paralysis and chronic fever. It facilitates menstruation.

Pepper is quite a popular remedy as an aromatic stimulant in cholera, weakness following fever (given then, specially in the form of hot pepper soup), vertigo or giddiness and coma or loss of consciousness. It is beneficial in dyspepsia or indigestion and in removing flatulence or abdominal morbid collection of gases. It is antiperiodic (viz. destructive of the intermittent fever) in malaria and a recommended alterative bringing about desirable alterations in the vital functions in cases of paraplegia and arthritic diseases.

Externally its application is preferred as a rubifacient (bringing about a desirable reddening of the skin) and as a reliever of sore-throat, piles and some skin diseases. Chinese consider pepper as an energetic stimulant, sweat provocative and carminative. Cambodians use it as a cure for dysentery.

Constituents

The pepper fruit consists of the characteristic volatile oil piperine 5 to 9%, another alkaloid piperidine 5 per cent, a balsamic volatile oil 1-2 per cent and fat 7 per cent and 1 per cent proteids. The midportion of the fruit has chavicin, a balsamic volatile oil, starch, lignin, gum, fat 11 per cent, proteids 7 per cent and ash with organic matter 5 per cent. Chavicin is a soluble, pungent and concrete resin characteristic of *P. chaba*; it has very little piperine and no volatile oil. Piperine cystallises into flat, four sided glassy prisms that are insoluble in water.

White pepper refers to the fruits of black pepper from whom the outer skin is removed by soaking them in water, after which the fruits are dried and bleached in the sun. This removes the pungent and the acid principles that are chiefly found in the outer portions. Uses of white pepper are the same as those of the black.

A very notable use of white pepper however is as follows:

This is a component of a pill reputed to be specific to check constant attacks of fever in elephantiasis. Yunani calls this pill as *hubbai saifa* and it is prepared thus: saturate white pepper and *ativisha (Aconitum ferox)* in milk for 3 days changing the milk fresh, daily. Grind the two in wet ginger juice and prepare pills. One pill is to be taken at a time, thrice a day.

Action in General

Black pepper is acrid, pungent, hot, carminative and much used in periodic fevers. Externally it is applied as a reddening and stimulating drug to skin. On the mucous membrane it acts like *P. cubeb.*

Ayurveda regards it as bitter in taste, bitter in post assimilation, hot in virility and destructive of *kapha* and *pitta.* It is strong, dry, light and promotive to digestion. It is useful in troubles of the voice, shooting pains and in infection with germs as an antiseptic.

Uses

As a culinary spice for sweet as well as savoury dishes and condiment this is well known all over the world. There are very many medicinal uses also and quite a few famous recipes. Some ideas of them are as below. Pepper is generally much useful in cold, feverishness, cough and a number of minor ailments. Western countries import pepper from India mainly to render their meat food tasty, preservable and improved in quality.

(i) ***Anorexia or tastelessness***: Using black pepper here gives excellent results. Take a small quantity of pepper, grind them fine, mix in water. Add sugar and an equal quantity of tamarind pulp and black salt, strain and keep. Give a small dose repeatedly at an interval of three hours. If anorexia

is of one day duration taking the medicine for one day is enough. If it is of a fortnight duration or so, it will be rectified in 2-4 days.

(ii) ***Fever:*** Black pepper gives quick benefit in ordinary fevers. The grains are to be coarsely ground, boiled in water till the quantity of water gets reduced to one fourth. After this cool, strain and administer the decoction rather hot. This is to be given once in morning and next at bed time. If the fever is mild, it may disappear the next day; if it is accompanied with constipation and gas troubles, fever will subside after a treatment of 3-4 days.

(iii) ***Partial headache:*** When this commences as soon as one gets up in the morning, keep a ground mixture of black pepper and the burnt earth of the fire place in equal quantity, strained and stored in a bottle. A pinch of this powder kept at the nostril and snuffed will give immediate relief. Or, when the headache is severe, grind 10-15 grains of pepper with the juice of *bhangra* (*Eclipta prostrata*) and apply this over the head as a rather hot poultice. This is a very beneficial measure. Or, take one *pav* of the juice of *dhattura* (*Datura*) leaf, 5 *tolas* of mustard oil, 1.1/4 *tolas* of a *chutney* of pepper and cook them all together. When the watery contents disappear and the oil alone remains, cool, strain and store. Use the oil for massaging and also place 2-4 drops of it in the nostril. This is also quite beneficial.

(iv) ***Severe phlegmatic trouble***: A common ailment of bad weather is increasing phlegm, coughing, sore throat, all round uneasiness, tastelessness in food, feeble, digestion, sweetish or bad taste in the mouth and so on. For this, take 30-40 grains of pepper, crush and cook in 1 *pav* of water till it gets reduced to 1/4th. Add 6 *mashas* of honey and give this dose morning and evening. Continue for a week, even if normalcy is restored. This is a sure cure.

(v) ***Gas complaints in the bowels***: This is often accompanied with constipation and feeble digestion. Even severe complaints of this nature can be cured by black pepper. Take 1.1/2 *mashas* of this pepper, powder finely and give it as one dose to be followed by a hot drink of lime juice. This is given thrice a day. The course is to continue for a week to eradicate the complaint fully.

(vi) ***Pain in the heart***: Pains arise in the heart due to the aggravation of *vata* or *kapha*. For this, take one *masha* each of the powder of black pepper and the bark of *arjun (Terminalia arjuna)*, mix them together with 3 *mashas* of cow's ghee and administer. The pain will disappear. This is to form one dose and there should be three doses like this for a day to be continued for a fortnight to 20 days to get the full relief.

Three Special Recipes

(i) ***Kalyana ksharam:*** Take equal parts of the three pungents (*pippalimul*, dry ginger and black pepper), the three myrobalans, the three salts, marking nut, *danti* (*Baliospermum montanum*), castor oil, cow's urine and ghee. Grind them all in cow's urine, keep the paste in a new pot, cover this with another mud pot. Close with a wet cloth dipped in clay and then heat. Use the resultant medicine when cooled. Dose is 1/2 to 1 drachm thrice a day in ghee, before meals. This is given in many complaints viz. constipation, colic, gastric troubles, anaemia, worms and so on.

(ii) ***For Cholera:*** The following pill was much reputed in Bengal. Take 20 grams each of black pepper, asafoetida and opium. Powder well and divide into 12 pills. One pill is to be taken every hour or two, as required but not too long as it contains opium. This is advised at the begining itself of the attack of cholera as a preventive measure.

(iii) ***A Confection:*** Take 1 ounce of black pepper, 1.1/2 ounce of caraway powder, 7.1/2 ounce of honey and prepare a confection or an *avaleha*. Dose is 1-2 drachms twice or thrice a day. This is best for piles in the aged and the debilitated. This is also beneficial in cases of prolapse of the rectum in the old and the weak.

The benefits of using pepper are still so many. Here is a short summary of them:

Used externally, pepper first carries out a scarifying action and creates an agitatedness. But finally it is pacificatory. Chewing this in the mouth leads to profuse saliva production. Taken internally it strengthens nerves, offers additional strength to liver, stimulates digestion, expels gases from the stomach and the intestines and also promotes urination and in addition acts as a sex stimulant and also as a stimulator of menstrual flow. It removes phlegm from the lungs, strengthens the intestinal mucous lining and also acts as a counteracting agent to cold poisons and thereby removes the complications that arise therefrom.

The principal beneficial fields of action are: stimulation of digestive ability, aid in digestion and the salutary effect on phlegmatic complaints.

For freckles on the face and also for some warts on the skin, a thin film of pepper is applied. A massaging is done with it in many cases of pains to mitigate them. For curing goitre it is ground with pine and applied as a paste. Since its chewing induces profuse salivation it is used beneficially when the tongue becomes heavy by finely grinding it and coating a thin layer of it over the latter. For reducing splenic enlargement it is ground with vinegar and applied.

For cough due to *kapha* and also for difficulties in breathing, black pepper alone or along with other drugs is employed as an electuary (a *lehya*)

in honey. For the diseases of *vata* and *kapha* pepper is given internally and also applied externally.

Pepper however is harmful to persons of hot constitution and the old people. Honey and cold unctuous substances however constitute the materials that can bring about a mitigation in such harmful effects.

Modern medical opinion considers black pepper as heating, stimulating and destructive of *vata* troubles. It brings into control most inermittent fevers. It has proved much stimulatory to urinary and post rectal areas specially, because of which reason it is seen to act beneficially in cases of piles. It has a definitely promotive action on the kidneys as it stimulates profuse urination. This has a beneficial effect in cases of "cold fever" or intermittent attacks of malaria, for instance, when it is given before an onset of fever. However, since pepper exercises no curative effect in fever as such, it is best given along with other drugs meant for fever specifically.

Pepper as a Household Remedy

Pepper is almost an invariable article of an Indian kitchen. Naturally therefore there are many household remedies based on pepper. A selected list of them in common use at present is given below.

Pepper is an excellent digestive drug substance. It is a sure cure to indigestion, flatulence or bloating of stomach due to gas collection and dysentery.

Take a spoonful of ghee, add to it roughly broken down bits of pepper and salt and boil. Mix this to hot rice and take it as the first morsel in your meals. This will prevent indigestion and flatulence. Another simple recipe to avoid any possibility of indigestion is to drink a cup or two of pepper soup specially after a heavy meal. Taking hot pepper soup at frequent intervals is a good and healthy practice. It is tasty as well as medicative.

Take a spoonful of pepper grains, pound them coarsely and boil this stuff in a cupful of hot water. Add a clove of garlic to it. Remove this decoction after five minutes, decant out the liquid alone. Taking this decanted decoction along with honey and three times a day would ensure efficient urination. This is also a curative for malarial fever. Add a pinch of salt to this decoction which can then be used beneficially to gargle for children suffering from inflammation of the throat and in tonsilites.

In cases of tooth ache, grind pepper grains into a smooth paste and apply it to the gums; the vitiated material would then get expelled and the pain will quieten down.

Roast some grains of pepper and powder. Taking this powder daily mixed well with honey gives an appreciable relief for running nose, cough and asthma.

Take a teaspoonful of pepper grains, roast them to an optimum degree. Coarsely powder these roasted pepper grains and take also a fistful of *tulasi* leaves. Place them both in boiling water and let them simmer for five minutes. Filter and take this decoction twice a day for three days. This will remove whatever indigestion one is suffering from.

A simple cure for getting rid of ordinary fever is as follows. Add two to three pinches of pepper powder to a spoonful of the juice of *tulasi* leaves and take it mixed with honey twice a day for three to four days continuously. During this period one should consume only liquid food and drink boiled and cooled water.

Roast some pepper grains in ghee, mix them with an equal quantity of sugar and then grind them together to a smooth degree. Taking half a teaspoonful of this powder thirce a day would eradicate cough and common cold. One more recipe to get rid of cough and cold is as follows. Take a well ripened banana fruit, add half a tea spoonful of pepper powder and mash well. Divide this into three equal quantities and take it three times.

Roast well half a teaspoonful of pepper grains, powder them fine, add this to boiling water and

boil it again. Cool down the water and drink. Keep drinking this water alone whenever you fee thristy This is a sure cure for quenching excessive thirst.

For a cough that has come about due to throat pain, make a mixture of coarsely broken pepper grains, a little bit of *omum* or *ajawan* and a few grains of salt. Keep this mixture in the mouth and go on sucking its juice intermittently. The violence of cough will get mitigated.

A simple method of getting rid of pimples that disfigure your face is to make a gentle application over them of pepper grains ground down in curds.

For cough and cold and the uneasiness and the triedness all over the body as a result of this common affliction, take a pinch of turmeric powder, two pinches of pepper powder, add them both to a cupful of milk and boil well. Taking this milk daily after meals would be greatly relieving. You will soon regain your normal liveliness.

One can prepare a *chutney* out of pepper and garlic ground together. Using this along with meals increases digestive power and improves health.

Add coarsely broken pieces of pepper grains to a spoonful of heated ghee and also salt to taste. Mix this with hot rice and consume. This will take away the bloating of the abdomen caused by indigestion.

In obstinate, intermittent fever and flatulence coupled with indigestion, 4 drachms of pepper are boiled in one *ser* of water till reduced to a quarter. This is then cooled overnight and taken in the morning. Another dose is prepared similarly and taken at night. The course is to continue for a week.

Other Species of Piper

Piper attenuatum Ham is a rambling species not much different from *P. sylvaticum* and is mainly from East Tropical Himalays, Sikkim, Bhutan and Upper Assam and Sylhet and Khasi mountains. Its roots maceracted in water is an excellent diuretic. *P. sarmentosum* Rox is from Malaysia and Java; its root is also a good diuretic. *P. aurantiacum* wall is from Nepal and Assam; its fragrant fruit is bitter and acrid and is used as a refrigerant viz. a cooling and soothing drug. Some consider this as the famous drug called *renuka* in Sanskrit. Bengali calls this as *renuka* while in Hindi it is called *shambalu kabel.* The fruits are bitter and astringent in taste; they are useful in curing fresh fevers and to quench thirst.

6. Piper cubeba Linn. Cubebs, Tailed Pepper

This is a woody and bushy climber indigenous to Java, Sumatra and Malaysia but is cultivated in India to some extent. The fruit is commonly called cubebs and are much used as a condiment in the tropics. This was a favoured drug of Arabic and

Iranian physicians for genito urinary diseases and became an official drug of the West in the Middle Ages. The Arabic name *kibabeh* would have presumably yielded the English cubebs. The essential oil (present in 10-15 per cent) in the fruit renders it valuable. It has a pleasant and characteristic odour and a greenish or greenish blue colour. Sanskrit calls this *sugandha maricha* (fragrant pepper) while Tamil and Kannada call it *bala melagu* (the tailed pepper).

Uses

It is a carminative and much praised drug in genito urinary disorders such as gonorrhoea, gleet, leucorrhoea and other vaginal discharges in women. The oil is also used similarly and in cystitis or inflammation of the bladder. Ten grains of its powder in an ounce of cinnamon water given thrice a day is beneficial in bronchitis and laryngitis. Cubebs produce tension of vocal cords, clears the throat of mucous and are hence much used by singers. Hakims regard this as excellent in urinary stones. Cubeb powder is best taken in milk.

B. RED PEPPER - CHILLY

In a book on spices of India, it is relevant to discuss chillies after peppers, not because they are Indian in origin, but because they have become so throughly acclamatised and familiar in India after its very recent introduction that Indian kitchen

now relies for its pungency on chillies rather than on its own native peppers. Chilly is the most important contribution from America to the spices of the world. This very familiar condiment is the fruit of several speices of the genus *Capsicum* of the family Solanceas to which the familar tomato and potato belong. Green chillies form fresh pungent vegetables while the red chillies constitute a valuable spice. The genus is native to tropical America and the West Indies, where however they were cultivated since very old times for e.g. even in the pre Inca period. Columbus when he reached West Indies in his search for India, found that the natives were using this pungent fruit invariably. Soon this reached Europe and was promptly named red pepper, after the pepper from India which was the sole pungent spice that the world had known till then. By 1600 A.D. this was a very extensively cultivated crop in Eastern tropics including India. Today capsicum is grown all over the world except in colder parts and forms infact the most important spice in many countries.

The very names for chilly in Indian languages betray this alien origin of the plant. It is always named after pepper. There is absolutely no reference for this in ancient ayurvedic classics. Recent Sanskrit authors call it *marichi phalam* (a fruit pepper), *katuvira* (very pungent) and *bruhi*. In Hindi, it is called *mirchi* or *lal* or *galch mirchi*; in Punjabi, *mirch, maltisa*; in Gujarati, *marcha*, in

Bengali, *lal marchi*; in Marathi, *mirchi*; in Kannada *menasina kayi*; in Tamil *melagayi* (both meaning, a pepper fruit), and in Malayalam, *kappala melakka* (pepper brought from ship) and in Malay, *chabai* (like S. *chava*) and *ladu mira*.

The plant is under cultivation since a very long time and as such there are many variations available, differing in the habit of the plant and in size, shape, colour and pungency of the fruit. In India itself there are many local preferences and varieties. The *byadagi* variety is one of the famous varieties of the South more preferred for its dense red colour rather than the pungency which is not much. The ripe fruits are dried in the sun, used whole or powdered. The ground fruits constitute the Cayenne pepper or Red pepper of commerce in the West. African chillies are the hottest but Japanese chillies are more favoured in the kitchen. The culinary use of chilli in making sauces, pickles, chutneys, curries and so on are too numerous to be mentioned. The varieties of chilli are often but different species of the genus *Capsicum*. The commonest is *C. annuum*. Linn.

Medicinal Use

Apart from its predominant and multifarious use in kitchen, chillies have some medicinal applications also. They are powerful local irritants, heart and general stimulants and also stomachic and tonic in mild doses. Their odour is pungent and the taste, sharp and burning. They are used fresh as well as dried.

The constituents are capscicin, the characteristic alkaloid which is volatile, capacin, another unique crystalline acrid substance, solamine, an alkaloid which is also found in many other members of the family (e.g. brinjal), a fixed oil, a fatty acid, a resin, a red colouring matter and ash 4 to 5 per cent. The pungency and the acridity are due to the oleoresin capsicin.

Externally a paste of chilly is used as a rubifascient (i.e. reddener of skin) and as a local stimulant in tonsilitis. In diptheria, its application is said to hasten the separation of the false membrane and thus heal. In chronic lumbago, a paste of capsicum with garlic, black pepper and liquid ambar (*shilaras*) or storax forms an efficacious application.

Internally also chilly is irritant and in large doses leads to gasteroenterities or the inflammation of the stomach and the intestine. When made into lozenges with sugar and gum tragacanth (*Astragalus strobifera, katera* in Hindi), it forms a remedy for hoarseness of voice. It is used as a tincture to stimulate as an adjunct in dyspepsia or indigestion, loss of appetite and flatulence. Pills made of chilly, rhubarb and ginger are effective carminatives. With Cinchona bark it is effective in intermittent and lethargic affections, gout and adanced stages of rheumatism. With *hing* and camphor it is used as pills in cholera. As chillies are powerful irritants specially to mucous membranes, a gargle of it in water (4 drachms in

one bottle of boiling water) is particularly effective in hoarseness and sore throat. If you pour hot vinegar on chillies all the essential qualities are preserved. Such a chilly vinegar is an excellent stomachic (i.e. good for stomach) and imparts a fine flavour to fish and meat food. The whole plant steeped in milk is successfully applied to reduce swellings and hardened tumours.

An unusual use of chilly is to make an infusion of it with sugar and cinnamon bark. This is a valuable drink for patient of delirium tremens—a disorder of the brain due to over absorption of alcohol often marked by convulsions and trembling symptoms. There is a type of madness called dipsomania which is a morbid craving for alcoholic stimulation. This chilly drink has the unique property of satisfying such cravings for alcohol in these unfortunate patients. This is used in the West Indies to relieve the common symptom of sinking at the epigastrium felt by the drunkards. Capsicum is also used in snake bites.

There is one more interesting use of chilly in the folklore. If a person is bitten by a snake and it becomes necessary to know whether the snake was poisonous or to know if he has become affected by that poison or not, give him a red chilly to chew. If the snake had been poisonous or in case he is affected by the poison, he will not feel the chilly pungent at all. If he feels it pungent one should conclude that this was not a case of a poisonous snake bite at all!

There exist a few more equally dramatic efficacies of this red chilly as it is more commonly called in India.

There is a specific *shloka* in so ancient a work as Atreya referring to one such effect of the red chilly. "A person who has lost all his senses and is also emasciated as he is sunk in the affliction of *sannipata* (which literally means a multitudinous affliction acting together) and whose pulses have also sunk, an administration of red chilly will drag even such a man from the embrace of death and make him live".

In cases of cholera also red chillies have a wonderful effect. This is how it is given then. The seeds are all taken out from them and only the skin is ground fine and strained through a piece of cloth. This powder is to be mixed with honey and pills are made out of this mixture-each of 2 *ratti* *in measure. These pills are to be dried in shade and stored. The patient has to gulp one such pill as such without any adjuvant drink whatsoever. A patient whose body has become cold, pulse is sinking and from whose skin cold puspiration is oozing out, even such a patient will display surprising results within ten minutes by this pill. The cold pespiration will stop down, warmth will return to his body and the pulse reverts to its

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* 1 *ratti* = 1 *gunza* (a seed of *Abrus precatorius);*
8 *gunzas* = 1 *masha;* 10 *mashas* = 1 *tola* = 10 grams
24 *tolas* = 1 *ser;* 1 *pau* = 1/4 *ser*

regular rate. Asafoetida and camphor are also sometimes added in making up these pills.

Take one *ratal* (2.1/2 *sers*) of red chilly seeds, add 6 *tolas* of water with it and soak over night. Secure oil from these soaked seeds now by means of a device called *patala yantra*, a press. Place a drop of this oil on a *batas* (a dry spongy sweet available in the country market). This is to be eaten with a milk *lassi*. Such a measure is extolled as bringing beneficial effects in *prameha*, an urinary disorder.

In Guiana the fruit of red chilly is considered a wonderfully exciting fruit.

If this is mixed with Cinchona it will act as an excellent medicine for destroying fever. Red chilly water is employed as a beneficial gargling fluid in cases of throat diseases.

The general action of red chilly in the body can be summarised as follows: Used externally it dissolves swellings, agitates blood and causes irritation. Chewed in the mouth, it produces much saliva and has a stimulative and regulative effect on the stomach and the intestines. If taken in excess, it may cause ulcers in the gastro intestinal tract. It is principally a stimulative, digestive material that causes an excitement to the heart as well.

It is used abundantly in India as spice in the food. By adding this in the food one can avoid the deleterious effects of *vatic* foods and those

foodstuffs that cause much gas formation within. Another advantage is that it will enable one to overcome adverse effects of frequent changes in water and climate as it comes about during a journey. Besides these, it is useful also in feeble digestion, imperfect digestion, flatulence and alcoholism.

Suppose there is a dog bite. Apply red chilly ground in water over the region concerned. Immediate effect is: a sense of severe burning. This is accompanied with an excess discharge of liquid. The final result however is that soon after this, the actual biting pain as well as the burning due to the chilly both will subside. There will not be any pus formation in the wound and the wound itself will dry up quickly.

Chilly should not be used much by persons of hot constitution.

Counteracting agents for chilly are milk and ghee.

Modern medical system concedes that red chilly is a very strong local irritant. If this is kept in intimate contact with any region to a considerable time, there will be the formation of blisters and scalds. When taken in a dosage befitting as a medicine, it causes salvation and stimulates the digestive tract as a whole. One can feel then the stomach getting hot thereby, Gastric juices are stimulated to pour out then and the rate of peristalsis or the involuntary movement in the

intestine is noticeably increased. On blood vascular system it may show astringent activity almost like that of the famous ergot drug, so that the bleeding comes under control soon.

Red chilly is much used as a sexual stimulant which has proved beneficial in such cases as impotence due to defective genital organ functioning, seminal discharge in urine (*shukra meha*) and catarrh of the prostrate gland.

Taken with *nux vomica* or (*Strychnos, kuchila* in Hindi) it is beneficial in fever with tremors and particularly in cases of extreme and chronic alcoholic effects.

In such violent situations like incoherent speech, tremors all over the body and in circumstances of bringing about a deaddiction from opium, chilly has been advised to be eaten in great quantities.

It is useful in seasickness, typhoid fever and also in chronic fever.

The other species of *Capsicum* found in India are: *C. baccata* (Brazil pepper or Pimenta), *C. Cerasiformis* (Cherry pepper, occasionally cultivated in European gardens), *C. fastigatum* (Guines pepper or *ghatior malabari mirch*, widely cultivated in tropical India; fruits oblong, scarlet, 1/2" long 3/4" and 1/5" thick, peculiar odour and a very hot and biting taste), *C. fruitescens* (Ceynenne pepper; *lavangi mirch* in *Marathi; jhal* in Hindi; used for pickling); *C. grossum* (Bell pepper -

bopla mirch in Marathi, *donne menasinakai* in Kannada, a large and inflated variety of *C. frutescens* with no pungent taste - a much liked vegetable), *C. longum* (Purple chilly. Occasionally cultivated) and *C. nepalense (Nepali marich* or *lavangi* fruit is small but very greatly pungent and much esteemed as it has a peculiar flavour).

Botanically chillies of India are considered to be of the following three species:

(i) **C. frutescens:** This is the African chilly. It is cultivated in fields and is a perennial shrub. Fruit is red, ovoid with obtuse tip or oblong and acuminate or with a drawn out tip. Mundas of Chota Nagpur use mustard oil in which roots of this chilly is mixed to shampoo the extremities to promote circulation of the blood. In Madagascar this is actually given in delirium tremens.

(ii) **C. annuum:** This is Bird's eye chilly. It is an annual or a blennetal herb or a shrub. The fruit is long and slender. (Tamil calls it *usi malagai* - needle chilly). The fruit enters into the preparation of arrow poisons of the tribal people called Dyaks of Borneo and Youri Tabocas of Brazil.

(iii) **C. minimum:** This is also Bird's eye chilli. This is a spreading herb. Fruit is ovoid oblong, cylindrical and orange scarlet, 13.20 mm long and erect. Kannada calls it *parangi menasina kayi*, foreign chilly. Tamil calls this as *usi malagayi*. In West Indies the fruit is used in scarlet fever. It is much used medicinally in Madagascar, where it is

regarded as a stimulant, a promotive of salivation, a digestive, a laxative and an antiseptic. *C. annuum* is *gach marich* in Hindi. This expels cough, kills pain, augments blood and removes swellings and pain. It is particularly irritating to skin on application. it is useful in scarlet fever and also in throat lesions, break in voice and bilious fever. In Madagascar its fruit is used to secure recovery from loss of consciousness and intoxicatedness due to alcoholic liquors. *C. minimum* is also called *gach marich* in Hindi, and *lanka mirich* in Bengali. The plant is much used in Madgascar as a stimulant, a digestive, a mild laxative, a wormicidal or worm killer and a preventer of bleeding. In Cambodia this is much praised as a drug that would bring about profuse perspiration.

C. CLOVE

Cloves form one of the most important and useful of the spices, coming down from antiquity and even now, well known. They were in use in China as early as in third century B.C., were well familar to the Romans and had reached Europe in the Middle Ages. Their source and place of origin were first discovered by the Portuguese in the sixteenth century and traced to Molucca Islands. They became first a Portuguese and then a Dutch monopoly. At present they are cultivated in many tropical countries of both the Old and the New World. Chief centres of their cultivation now are

Zanzibar, Pemba, Madagascar, Sri Lanka, Mauritius, Malaysia, Sumatra, Java, Borneo, and Brazil and Guiana in South America. It is now grown to some considerable extent in Kerala state and Tamil Nadu in India, though large amounts of cloves are imported by us from Zanzibar and Pemba.

Cloves are the unopened flower buds of *Syzigium caryophyllaeum* Gaertn (previously called *Eugenia caryophyllata*) belonging to the family Myrtaceae to which the *guava* and the *jamun* fruits belong. This is a small, conical, very symmetrical, evergreen tree. It produces clusters of crimson flowers in the wild state but never reaches this flowering state in cultivation. The flower buds are greenish or reddish while fresh but become brown and brittle on drying. Their shape is nail like; the term clove comes from a French word for nail, *clou*. Each bud has a rather cylindrical expanding base topped by the plump ball like unopened petals, surrounded by the four teeth of the sepals. The tree grows to a height of 30-40 feet with many flexible downward branches spreading all around. Bark is pale yellowish grey and smooth and slippery. Leaves are simple with an entire margin and occur opposite to each other but very closely on the stem. Leaf blade is broad in the middle and pointed at either ends. They are shining on the upper side; rather pale beneath and provided with prominent ribs. Leaves of clove taste strong and aromatic. Fruits are produced rarely; they are fleshy, red and when

fully ripe they turn blackish like the cloves of the bazaar. Flower buds are plucked out before they open and are dried artificially; these constitute the cloves. If they are of good quality they should ooze out an oil when pressed with fingers.

Flowering and fruiting commence from March to June. Two types of cloves are available in the bazaars. Some are blackish and strong smelling. They are of original and good quality. Others are brownish and somewhat bitter in taste. These are of the second grade variety from which the oil has been already taken out by steam. Clove buds are hand plucked when the green fleshy receptacle starts getting red, for, the oil content is the richest at this stage. Or, the inflorescences are also collected from movable platforms fixed to the trees, or, the buds are detached with the help of the bamboos. They are then dried in the sun (rarely in kilns) and separated from the stalks, which are also sold out as clove stalks.

The crop is often uncertain and rather hard to grow. They cannot be propagated by cuttings and the seeds grow very slowly. For large scale operations nursery seedlings have to be utilised. The yield is low till the trees are at least 20 years old, but they continue to yield till they become 60 years. There is an endless demand for cloves. India does have a climate suitable for its much better cultivation than has been so far practised specially in Kerala and Tamil Nadu and the West coast.

Names

Sanskrit calls this *lavanga, deva kusuma* (the flower of the gods); *shri samgna, shri prasuna* (the auspicious bud).

This is known as *laong* in Hindi; *lavanga* in Marathi, Kannada and Bengali, *laving* in Gujarati, *karambu* in Sindhi; *kirambu* in Tamil, *kartambu* in Malayalam; *lavangamu, karavappu* in Telugu; *karana phul* in Arabic; *mekhala, kharan ful* in Persian.

Constituents

Cloves contain a heavy volatile oil 16 to 20 per cent, a camphor resin 6 per cent, caryophylin and eugenin - the alkaloids, a crystalline substance convertible into caryophyllic or eugenic acid with the aid of nitric acid, tannin convertible into galloiotannic acid, woody fibre, gum and so on. Clove oil contains 85 to 92 per cent of eugenol which resembles phenol chemically, acetyleugenol and caryophyllene.

Actions in General

Cloves given internally are good for stomach, stimulant, carminative, aromatic and antispasmodic i.e. counteracting involuntary alternate contraction and expansion of the muscles. They also increase blood circulation, raise the heat, promote digestion specially of the fatty and the crude heavy food, augment nutrition in general and offer a relief in gastric and intestinal

pains and spasms. It gets excreted in breath, bile, perspiration, milk and urine. Applied externally it is antiseptic (preventing and killing bacterial growth), acts as a local anasthetic (a desensitiser) and also as a rubifacient i.e. it reddens the skin and activates it. It stimulates skin, salivary glands, kidney, liver and the mucous membrane of the bronchil.

Ayurveda regards it as bitter and pungent in taste, cold in virility, and light in digestion. It destroys the *doshas* of *kapha* and *pitta*. It is tasty, digestive and stimulative and good for the eyes. Therapeutically it is used in the disorders of blood, excessive thirst, vomiting, flatulence, shooting pains, cough and breathing troubles as well as in headache.

Atreya Samhita regards the clove oil as destructive of *vata* aggravation and also of *kapha*. It cures swelling of the gum and vomitings of the pregnant.

Yunani considers it to be 3rd degree hot and 3rd degree dry, aphrodisiac (increasing the sex urge), carminative and strengthening to brain. It is advised in curing the disease due to cold, and also in paralysis and apoplexy. Other uses are in bronchitis, nausea, loss of appetite and hiccup.

Cloves are used medicinally in many forms: as a paste (*kalka*), an oil (dose is 1/2 to 3 minimum), an essence, a tea (dose 1 to 4 ounces), an infusion of 1 part in 40 of water, (dose is 1/2 to 1 ounce) and also commonly as a decoction.

Medicinal and Other Uses

The use of cloves as a spice in various types of food is well known and prevails in many countries of the world.

In medicine, their very common uses are: 1. To prevent griping or spasmodic muscular contraction and expansion that often follow purgative administration, 2. To expel gas collection in the bowels and thus relieve the bloating of the belly or the flatulence caused thereby, 3. To secure pacification of various forms of gastric irritability as well as colicy or twisting pain of the stomach and 4. To increase the flow of saliva as well as cure dyspepsia or indigestion. Besides these predominant list of uses, cloves have many other familiar, well tried and traditional medicative applications. These range over many an ailment common to all. A selected list of them is given below. Among these diverse uses, we can recognise eight distinct areas of thereapeutic action on the part of the cloves in all of which cloves have proved excellent. They are:

(i) Cloves have a direct and unfailing action on digestive system. It creates taste in food, confers a feeling of well being and comfort, increases hunger and augments the secretion of digestive juices.

(ii) This is an effective antiseptic, preventing and killing bacterial growth and is thus a good preservative of food. It destroys harmful germs in the stomach and the intestines and thereby also

prevents flatulence or bloating of the abdomen that may come about otherwise.

(iii) The third significant action is that it augments the development of white blood corpuscles in the blood, which are the principal agents of our defencive mechanism of the body destroying as they do extraneous infective micro organisms. Thus cloves confer a considerable amount of resistance to disease for our body.

(iv) Cloves activate vital power. Because of this reason, the use of cloves is attended with good and explicit effects on heart, blood circulation and breathing. It is because of this reason again clove forms an ingredient of medicines given to assuage the aggravations of all the three *doshas*.

(v) Cloves are antispasmodic, rectifying undesirable involuntary muscular contraction and expansion. This is best seen in their effect on respiratory channels and this is why cloves from effective agents in asthma and breathing difficulties.

(vi) Cloves are excellent in masking obnoxious smells, anywhere in the food, medicine or the body. The last effect is utilised in getting rid of the foul smell in the mouth or that which is due to *kapha* or sputum and saliva.

(vii) Cloves are good diuretics. They promote urination markedly and thus help in cleansing the urinary system and eliminate undesirable products from the body in this manner.

(viii) A remarkably useful property of clove is that wherever it comes in intimate contact (for eg. in the form of clove oil) externally on the body, it exercises an activating, pain killing, wound cleaning and wound healing effect on the regions concerned.

Yunani physicians rate cloves as third degree hot and dry. According to them an external application of the cloves leads to a dissolution of the swellings and oedema, a disensitisation and a prevention of gangrene formation viz. rotting. Used internally cloves confer a sense of well-being and are strengthening to heart and brain, counteract spasms and expel the phlegm or *kapha* out. This strengthens also the stomach, the intestine and the liver. It expels air. It is very aphrodisiac (increasing the urge of sex) and acts as a retentive of semen.

Some Household Tips

Keeping a few cloves in the mouth and going on sucking its juice will obliterate foul smell of the mouth.

Chewing a few cloves adding a couple of salt crystals to them and sucking in the juice will destroy sore throat, and also stop coughing.

Taking the decoction of cloves thrice a day proves beneficial in flatulence or bloating of the belly due to gas collection and also indigestion.

For curing ear-ache and discharge in the ear dip a clove in gingiley oil several times. Heat this oil and place a few warm drops of this oil into the paining ear. This will remove the distress and quieten the pain.

However it is advisable that patients of diseases of stomach, intestine and kidney should better avoid consuming *masala* substances of any type including cloves. Even if they use them, it should be done in great moderation. Aromatic oils of clove contain ingredients that help in stabilising blood circulation and regulating the body temperature. Cloves are said to promote the flow of enzymes and thereby foster efficient digestion. The arthritic like muscular cramps are often mitigated by the use of clove oil as an external application and also as a poultice over the affected part.

Cloves occupy an important place in Tibetan medicine and their monasteries. The oil of clove is extolled much by them as a pain killer.

A Tibetan cocktail

The forbidden and mysterious land of Tibet, the Roof of World as it is called is famous for its centuries old Monasteries and their youthful looking lamas. There sacred men often reach beyond a century of productive and youthful life.

A secret drink that they are reputed to thrive on, is almost a Tibetan cocktail.

This is how it is prepared: Take whole and unground cloves. Select about four such good cooking buds. Steep them in a cup of boiled water upto five minutes. Strain it well. Then sip slowly.

In spite of its difficulties and uncertainties, clove is always a profitable crop commercially. Greater attention from our enterprenuring agriculturists in the future is bound to save us from importing a great quantity of cloves specially from Zanzibar and Pemba as it is done currently.

Cloves are very aromatic and the flavour is fine, delicate and imparts a warming up. Their uses are innumerable, both whole and ground. As a culinary spice they blend well with both the sweet and the savoury dishes offering a characteristic and pleasing flavour. They are much used in flavouring pickles, curries, ketchup, chutneys and sauces. They are used to perfume the breath and the air in rooms. Besides offering an agreeable aroma, they are also stimulative. This has made them to be much in demand by the chewers of pan and the smokers of cigaretee. Clove cigarettes are in great demand in Java and the rest of Indonesia as well. Medicinal uses of cloves are also many.

Clove oil obtained by distilling cloves with water or steam has still greater number of utilities. It has great application in medicine - as an aid to digestion, as an antiseptic drug and as an antispasmodic agent, counteracting involuntary, contraction and expansion of the muscles. It is a favourite antiseptic and pain killer in tooth ache

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microscopic observation in the laboratorie
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extracted and used as an imitation carnation
flower in purfumery and in preparing artificial
vanilla scent.

Clove stems also form commercial products as they contain a smaller percentage of the oil and are often utilised to adulterate cloves. The dried fruits called mother cloves also have some value.

The major clove producing countries are Zanzibar and Pemba which grow 90 per cent of the world's output, Indonesia, Mauritius and the West Indies in the New World.

Cloves are extensively used in Ayurvedic as well as Yunani Medicines, either as decoction or in powder form. Western medicine mostly uses the distilled clove oil. A special advantage of this oil is that it mixes easily with grease, soap and spirit and as such, it is employed extensively in perfurmery industries. It imparts a delicate aroma to all of its preparations and easily masks the taste of many obnoxious preparations—a point of great advantage to commercial manufacturers of medicines and food suppliers.

The demand for clove and clove oil is ever increasing and has registered a great spurt in recent years, specially to scenting the cigarettes. China, Japan and India are the three principal importing countries. As a spice in the kitchen, clove is used almost all over the world.

Modern Opinion

It is important to note that many of the traditional claims of the efficacy of the cloves have been largely supported by modern works. Modern medicine regards cloves as stimulative and expelling to the gases of the bowels. The properties of clove are traceable to its volatile oil content. If clove oil is rubbed on the skin, it proves excitatory and inflammatory in reaction. When a massaging is done with it, all the local sensory elements get excited; initially this causes no doubt a titillating action and an amount of pain and then a local desensitisation. Cloves are undoubtedly antiseptic and hence cleanse the wound from their germs. Cloves in the mouth also titillate the mucous membrane of the mouth, activate all the local sensory buds, increase salivation and then follows however a local desensitisation. Because of its pungent taste, all the taste buds on the tongue get excited. Its pungency and stimulation are felt even in the stomach. There will be an increase in gastric secretion, all over the alimentary tract.

The stimulative effect is seen even on the heart. The nervous system gets excited and experiences a sense of increased vigour. A similar stimulation is

Externally applied it has a counterirritant action. It is an ingredient of many tooth pastes and mouth washes.

The oil is in great demand industrially also. It is extensively used in perfumery, in scenting soaps and as a cleaning agent in histological work for microscopic observation in the laboratories. Eugenol which is the chief constituent of the oil is extracted and used as an imitation carnation flower in purfumery and in preparing artificial vanilla scent.

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felt at the intestines, secretion of juice augmented, gases get expelled and if there is due to irregular contraction, that would regulated and a relief sets in. Circulation of blo is increased, white blood corpuscles get augmente as noted above and the action of heart improve because of the excitation of the nervous system o the stomach and the circulation of blood. Finally, as most of the clove material gets expelled through kidneys, skin and respiratory organs cleansing all the way, salutary effects are seen even in these outpost areas of the body.

Modern medicine thus considers cloves as aromatic, digestive, gas expelling, excitatory, destructive of blood disorders and phlegm, antiseptic, diurectic and a remover of foul smell.

We shall now see some of the uses of cloves in specific diseases.

Vomiting: Take a *masha* of cloves, pound and boil in 1/2 a *pav* of water till the latter gets reduced to its quarter and strain. Give this decoction in one or two teaspoonfuls with sugar, when it is still rather warm. If need arises this may be given 4-5 times a day with an interval of 4 hours. This decoction of clove is also beneficial in excessive thirst, tastelessness and loss of hunger.

Take a *masha* of the powder of cloves, mix it with a syrup of sugar candy or pomegranate juice. This is to be taken by the pregnant by licking, to get rid of the repeated vomitings and the agitation

thereof. Cloves are the best drugs for checking such vomitings by the pregnant. An infusion of cloves also serves the same purpose but this should not be given if there is an accompaniment of fever along with vomiting.

Toothache: Keep a swab of cotton impregnated with clove oil at the teeth for 4-5 days and at an interval of 4 hours in cases of severe and continuous pain at the teeth. Pain will vanish. This is good in pyorrhoea also much like creosote, a well known drug for the purpose. Keeping a few pieces of cloves in the mouth will get rid of all types of foul smell in the mouth.

Pains: Clove oil is applied in cases of rheumatic pains as well as headache in addition to the toothache noted above. Take two cloves and 4 *rattis* of opium, grind them together, warm up and then apply at the forehead; this will get rid of the painful head-ache due to common cold and catarrh. Take 6 *mashas* of cloves, grind fine with water, make a paste, warm it up and apply at the temples. This is an effective cure for partial or onesided head-ache and other types of head-ache as well. Neuralgic pains of the head also respond well for this treatment.

Tastelessness: Take a *tola* of clove powder, mix it with one fourth *pav* of a syrup made up of ripe tamarind pulp, add one *pav* of water and add four *tolas* of sugar. This constitutes four doses of medicine. Keep giving this as a sipping drink at an

felt at the intestines, secretion of juices is augmented, gases get expelled and if there is pain due to irregular contraction, that would get regulated and a relief sets in. Circulation of blood is increased, white blood corpuscles get augmented as noted above and the action of heart improves because of the excitation of the nervous system of the stomach and the circulation of blood. Finally, as most of the clove material gets expelled through kidneys, skin and respiratory organs cleansing all the way, salutary effects are seen even in these outpost areas of the body.

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interval of two to three hours. Continue for two to four days. All types of tastelessness in food will be benefited by this procedure. At intervals the patient may be asked to keep chewing a bit of *saindhav* salt.

Fever: A drink of clove and *chirayata* (*Swertia chirayata*) in equal quantity ground in water will take care of most fevers effectively. This will also remove the sense of weakness that follows after fever.

Asthma and cough: Prepare a pill using cloves, flowers of *Calotropis* (*madar*) and black salt. This is to be kept in the mouth and the juice is to be continued to be sipped in. This will set right asthma and many disorders of respiratory tract. If coughing is very troublesome take 3 *mashas* of cloves and an equal quantity of the rind of the pomegranate fruit, powder them together and strain with a thin cloth. This is to be licked up with one and half a *masha* of honey, thrice a day. Or, just keep a few cloves in the mouth and continue sipping its juice. This removes distressing cough. This is specially beneficial in coughs. Fry cloves on fire, mix with honey and give this for licking. This is best for whooping cough.

Diseases of the eye: Powder cloves in a copper vessel, mix with honey and then apply in the eye through a collyrium needle. This is particularly advised for the ailments of the white portion of the eye.

Burning sensations at the chest: These will get quietened down by drinking cloves ground in cold water, strained and mixed with sugar candy.

Indigestion: Prepare a decoction of cloves and *haritaki* (*Terminalia chebula*), add a pinch of *saindhav* salt and give it to the patient as a drink. This will remove indigestion and also act as a laxative.

Nausea: Grind cloves with water, give this as a drink when it is rather warm. This will get rid of the nausea and will also quench down thirst.

Thirst of Cholera: Take one *tola* of cloves, boil this in 128 *tolas* of water. When it simmers 2-3 times remove from the fire, cool, keep it in a large vessel and close the lid. Give one ounce of this water every time at repeated intervals. The distressful thirst of cholera will get quenched in this way.

Ulcers: Apply cloves and turmeric ground together.

Running Nose: Administer three drops of clove oil along with sugar. Or, sprinkle clove oil on a piece of cloth and keep smelling it. Take 7 cloves, powder, mix this in 10 *tolas* of water and boil, till the quantity of water becomes reduced to 2.1/2 *tolas*, cool and strain. Let the patient sniff its fumigation through both the nostrils. When this becomes cooled down give it as a drink to the patient.

To Promote Hunger: Prepare a powder of cloves and *pipal*, strain through a piece of cloth. Let the patient lick 1.1/2 *mashas* of this powder with honey. This will take care of the feeble digestion, feeling of tiredness and weakness that follow fever. These drugs can be given in the form of decoction also.

To Expel Phlegm or Kapha: Boil 3 *mashas* of clove powder in 10 *tolas* of water till the latter becomes one quarter of its original quantity. Strain and give it as a drink while it is still rather hot. For expulsion of phlegm there is no medicine like clove.

Indigestion, acidity of belching and stomach upsets: Take one *tola* each of clove, dry ginger, *pipal* and *ajwan*, 5 *tolas* of *saindhav* salt, and 5 *tolas* of sugar candy. Powder them all together, keep in a porcelain vessel and pour over it lime juice to such an extent that all material sink in it. Expose this to sun for sometime and then store safely. It is to be taken after the meals in a dosage of 6 *mashas* to 1 *tola*. This will increase taste and relish of food, acid belches will disappear, indigestion will be removed and the entire digestion system will improve in its efficacy.

References in Ayurvedic Classics

Both Charaka and Sushruta do contain references for clove but it is mentioned mainly as an adjunct material to be consumed along with betel leaf. References to cloves as a medicinal drug

are very few. One of the names for clove is '*Varisam bhava*' born of waters; it is presumed that this name was given mainly because cloves constituted a material which was then mostly imported across the waters of the oceans.

Two specific references from the classics are as follows:

Shodala: In cholera, the water in which cloves are boiled is to be given to the patient after cooking it so as to quench the excessive thirst that such a patient usually experiences.

Vaidya Manorama: The outer skin of the clove is to be ground with luke warm water and applied as a paste for mitigating the troubles that are due to *vata.*

Clove Oil: The oil extracted from the cloves is actively employed in shooting pains of arthritis, in headache and the painful tooth ache. In all of these cases it is used as an external application.

Special, Composite and Proprietary Preparations or Yogas

There are a large number of *yogas* making use of clove as it principal ingredient. A few selected examples of this nature are given below along with the mode of their preparation and the specific uses to which they are recommended and are actually utilised. For, all of these are in actual use now and many of them are available among those who deal in Ayurvedic drugs. Quite a few of them however can be prepared at home and employed.

These preparations take various forms, tablets (*vati*), powder (*churnas*), pills (*guti*) infusions (*phanta*) and sweet meats (*modaka*).

Tablets

1. Take four parts each of cloves and opium, six parts each of *pipal mul* and pyrethrum root (*akarakara mul* in Hindi), and eight parts of honey. Powder the former, mix with honey and prepare tablets of 4 *rattis* in weight.

This is an invaluable medicine for lassitude, indigestion and general debility or weakness.

2. Take cloves, *baheda* (beleric myrobalan), black pepper and *catha* (catechu) in equal proportions. Mix and thin them in the decoction of *babul* bark (*Acacia arabica*) for 12 hours. Prepare tablets of two *rattis* each. Take one tablet a day, place in the mouth and go on sucking in the juice from these lozenge like tablets. You can go upto ten tablets a day.

This will thin down the hardened phlegm and easily expel it out. It also stops the production of further phlegm or *kapha*. Most importantly this will highly reduce the great distress felt while coughing.

3. The greater tablet (more complicated). This contains several ingredients apart from cloves, such as nutmug, coriander, white and black cumin, dry ginger, pepper, pipal, the triphala, cardamom and so on along with *vid* as well as

saindhav salts. This is also followed by treatment with mercury, sulphur and the like. Tablets of three *rattis* weight are made and taken with water as the after drink.

This is efficient in *grahani* (mal absorption), painful dysentery, excessive and painful gas trouble, shooting pains and fever due to *kapha*.

Powders

There are very many types of powders. A few are given.

1. Take five parts each of cloves and dry ginger, six parts of *ajavan*, and *saindhav* salt. Mix and prepare their powder.

This destroys indigestion and acidity of the stomach. Dosage is 15 grains.

2. Take six *mashas* each of cloves, nutmeg, nutmace and *pippali*, two *tolas* of black pepper, sixteen *tolas* of dry ginger and twenty *tolas* of sugar candy. Powder them all, strain thrcugh a piece of thin cloth and store.

This is to be taken in a dose of two to three *mashas* thrice a day and along with water.

This is beneficial for chronic mild fever, repeated but small quantities of motion, repeated onsets of cough, indigestion, flatulence, difficult breathing and the like.

A Caution : It is advisible to prepare such powder of cloves and the like that are aromatic in nature, fresh as the occasions arises. For, if they are kept stored for a long time their essential oils are likely to evaporate away.

3. Take cloves, *pipal*, and nutmeg, one half a *tola* each and black pepper, two and half a *tola*, dry ginger, twenty *tola* and sugar candy equal to the total quantities of all these. Powder and use in a dosage of three to four *mashas*.

This is excellent for cough, consumption, tastelessness, *prameha*, splenic enlargement and piles. It also purifies throat and mouth.

Decoction

Prepare a decoction of cloves and chebulic myrobalan (*harad*) one *tola* each. Add a pinch of *saindhav* salt.

Drinking this is purgative and a cure for indigestion.

A Sweetmeat or Modakam

Take one part each of the following: cloves, *pipal*, black pepper, dry ginger, white cumin, black cumin, *naga keshar* (*Mesua ferrua*), cardamom, nut meg, nutmace, *tejpat*, white sandal, *kankola*, coriander and *saunf*. And, then take clove powder equal in quantity to all there. Add them all to a syrup of country sugar double the net quantity of all these. Prepare *modakas* from this mix.

This will destroy very severe *amlapitta*, feeble digestion, indigestion and all kinds of intestinal mal absorption.

This is also strengthening and very much nourishing.

D. CINNAMONS-DALCHINI, TEJPAT

Though *dalchini* is a well known cinnamon bark, its genus *Cinnamomum* contains a number of other species which are all famous spices. Of these, Chinese Cinnamon or *C. cassia* is probably one of the oldest spices known to mankind. This was known in China even in such early times as 2500 B.C. and in Egypt in the seventeenth century B.C. while among the Mediterranean Coast also, its use was familiar since very early times. In the earlier records however, it is likely that this was much confused with what is familiar in India as *dal chini*, which it must be noted is not originally an Indian but a Ceylonese tree. Even the Chinese cinnamon is obtained from a cinnamon tree which is a native of Burma, now Myanmar.

There are several other sources of cassia of lesser importance, in the world trade of these cinnamon barks. Indian cassia comes from *Cinnamomum tamala*; Padang cassia, with smooth bark and no cork, is from a *C. burmanni*, a tree of Indonesia. Large quantities of this cassia are imported to the United States of America. Inferior substitutes of cinnamon bark sometimes

mistakenly called cassia bark come from Australia and New Guinea respectively from *C. oliveri* and *C. massoia* also called Oliver's bark or Massoia bark in turn. True Cassia bark viz. from the tree of *Cassia augustifolia* is a totally different tree, belonging to an altogether different family Leguminosae. Commercially this is known as Senna bark.

Cinnamon bark and cinnamon oil are used in medicine, for flavouring of food-stuffs and beverages, in the manufacturing of soap and in candy making as well as in perfumery industry.

Tejpat and *dalchini* are the two important cinnamon barks of India. Cinnamon bark or *dalchini* was discovered by the European traders much later than cassia viz. the Chinese variety but once this discovery was made its superceded the latter very soon to a great extent. As usual, however, the plant was in use by the native people centuries before the Europeans became aware of it. This actually is a native of Ceylon and is often called the Ceylon cinnamon. For many years this was grown only in Ceylon and the Portuguese had held a monopoly of its trade, who were soon displaced by the Dutch and then the English. Now the tree is cultivated in South India, Burma, Malaysia and to some extent in West Indies and South America.

The genus *Cinnamonum* consists of evergreen, aromatic trees or shrubs. The leaves are opposite or alternate, gland dotted and usually have three

prominent nerves. Flowers are small, mostly bisexual (i.e. both male and female structures found in the same flower) and are arranged in much branched clusters or panicles. The fruit is a berry resting on the spreading and more or less enlarged perianth, whose segments however mostly fall down quite soon.

The genus is Indo-Malayan in distribution and contains 80 species. Of these, seven are present now in India. Many of these species available in India are much used medicinal plants in many other countries also. For example, they are *C. camphora* and *C. cassia* also employed in China and Malaysia *C. pauciflorum* and *C. tamala* much utilised in the Phillippines as well. Some of them are officially recognised drugs in the Pharmacopeas of many countries. They are *C. camphora* in Austria, Denmark, Great Britain, Holland, Norway, Sweden and United States of America, *C. zeylanicum* in Great Britain. France and many European countries and *C. cassia* in great many countries of the world.

Medicinally the species of this genus are stimulant and stomachic (good for stomach).

Concerning *tejpat* and *dalchini* the two of the most important spices of the family, it is probably corect to say that botanically speaking, *tejpat* represents the fragrant, dried leaves of *C. tamala* (*tamala patra*) while *dalchini* is the aromatic dried bark of *C. zeylanica* (*sugandha valka*). Still however, *tejpat* as it occurs in the market and as

dealt with in different regional languages refers to the leaves of many other species of *Cinnamomum* besides *C. tamala*. This happens to be so because leaves of many species of this genus are rather similar in appearance, aroma and properties and are actually used similarly under the common name *tejpat*. Something similar happens as regards camphor. Though camphor comes from *C. camphora*, many other species of the genus also can and do produce camphor.

Both the *tejpat* and *dalchini* come from the plants of the genus *Cinnamomum* belonging to a family of aromatic trees called Lauraceae to which the famous camphor plant *Laurus camphora* Linn (now regarded as a species of *Cinnamomum* itself, viz. *C. camphora*) also belongs.

The genus *Cinnamomum* contains quite a number of species, of which seven are common in different parts of India. All of these are likely to be called a "variety" of either *tejpat* or *dalchini* or even both in our different regional languages. Besides, all of them also have some medicinal value or the other in addition to being famous spices. In addition, they are likely to be often used as mutual substitutes. Because of these reasons, let us have some basic ideas of all of these seven valuable plants of our country. One more important reason for considering *all* of them is: this is how we can properly appreciate the many details of our available wealth which we have not utilised as yet at all.

The diagnostic botanical features for these seven species are given in the following key:

A. Leaves are opposite (facing each other in pairs or subopposite) with 3 prominent nerves.

1. Leaves are 7 to 5 cm long, ovate oblong or lanceolate in shape, usually acuminate (viz tip, long drawn out) and pointed; blade is 3-nerved. *C. tamala*
2. Leaves are quite smooth, hairless, 20-30 cm long, very leathery; elliptic-oblong in shape; tip, acute, obtuse, or acuminate; blade, is 3-nerved. *C. obtusifolia*
3. Leaves are quite smooth, hairless, 5.10. cm long; ovate lanceolate in shape; tip; acuminate; blade is 3-nerved. *C. pauciflorum*
4. Leaves 15.30 cm; shape, elliptic, elliptic oblong; tip, acuminate; blade, strongly 3-nerved *C. javanicum*
5. Leaves 7.5-10 cm; quite smooth, hairless; shape, oblong-laceolate tip, tail like, acuminate; blade, 3-nerved. *C. cassia*
6. Leaves, smooth, hairless. 7.5-20 cm long; shape, lanceolate oblong or linear-oblong. *C. iners*
7. Leaves, 10-18 cm long; smooth, hairless; very leathery; ovate or ovate lanceolate, in shape; blade is 3-5 nerved. *C. zeylanicum*

8. Leaves 12.5-20 cm; shape, oblong lanceolate; blade is 3-5 nerved. *C. macrocarpum*

B. Leaves alternate on either side of the stem, the nerves are many and are arranged on either side of the midrib as the feathers of a bird and not few in number, prominent and radiating from the base as it were, as in the members of the section A, above.

1. Leaves are long; tip, acuminate and blade 5-10 cm. The secondary nerves arising from the branches are 2-3 pairs. *C. camphora*

2. Leaves are 7.5-12.5cm long; elliptic-lanceolate in shape; tip, tail like-acuminate. *C. glanduleferum*

3. Leaves are extremely variable in shape; the largest is 20-10 cm, and leathery; others are thinner, almost membranous and shining beneath. *C. partheno xylon*

INDIVIDUAL SPICES

1. Cinnamonum tamala (from the Sanskrit name *tamala*) Fr. Nees.

Names

This has many names in Sanskrit, *ankusha; chadana; dala, dalahavya; gandha jata, sura nirgandha; surasa; gomeda; gopana; ishtagandha; vasanahvaya, vastra; patra, patraka; patrakhya;*

roma, romasha; shitarasa, sukumaraka, tamalaka, tamala patra; tapasa; tejapatra (pungent leaf).

In English, it is Cassia lignea, Cassia cinnamon; it must be noted that these two terms, are also applied to *C. Cassia.*

In Bengali, it is *tejpat*; in Bombay market, *darchini, tamala;* in Gujarati, *taj, tamala patra;* in Hindi *barahmi, dalchini, darchini, taj kalam, taj kalmi, tajpat, talispatri, talis putar, tezpat;* in Marathi, *dalchini tiki, sambhar, pana, tamala patra;* in Nepal, *chota sinkoli, sinkoli, tezpat*; in Kannada, *dalchini, lavangada pattai, lavanga patri, kadu dalchini*; in Tamil and Telugu *talisha patri*; in Urdu, *tejaput.*

Botany

This is a small or medium sized evergreen tree of Jayantia Hills and Bangladesh. Bark is dark brown or blackish, slightly rough. Leaves are opposite, sub opposite or even alternate, shape ovate-lanceolate or oblong; tip, acuminate; leaf is leathery, scarcely shining above but quite shining, beneath. There are 3 prominent nerves starting close from above the base and running almost upto the apex. Flowers are pale, yellowish and occur in axillary and terminal lax panicles that are minutely hairy. Fruit is a drupe (i.e. felshy with a "stone" inside containing the seed within) ovoid and black. This is the source of *tejpat* leaves extensively used in North India as spice in the *garam masala.* The bark is Cassia bark or Indian Cassia.

This is a tree growing wild in tropical and subtropical Himalayas growing at an altitude of 3,000-7,800 ft. and occurs well in Sylhet and Khasi and Jayantia Hills and Bangladesh.

Medicinal and Other Importance

Leaf is bitter and sweetish in taste; it is "heating", alexiteric (i.e. countering poison) and useful in *vata* aggravations and also scabies, diseases of the anus and the rectum, piles, heart troubles, ozoena (fetid discharge from the nostril) and also bad taste and foul smell in mouth.

Yunani physicians regard its leaf as having a sharp taste and being a tonic to the brain, destructive of worms, diuretic, good for the liver and spleen; and, useful in inflammation in general and sore eyes. Excess of salivation is stopped by using this leaf.

In Punjab, leaves are used in rheumatism, colicy pains and diarrhoea. The bark is given in gonorrhoea; its decoction or powder is given with good effect to suppress lochia or a discharge after child birth.

The bark is coarser and sold in larger pieces than the bark of *C. zeylanicum* or *dalchini* for which it is often used as an adulterant. This yields pale yellow essential oil whose chief constituent is cinnamic aldehyde just as it is with *dalchini*. But the difference between the two oils is enormous. In *dalchini* the associated materials (pinene, nonyl

aldehyde etc.) have a fragrant and delicate odour whereas in the bark here the cinnamic aldehyde is marked by terpenes which impart a rather disagreeable odour. *Tejpat* oil is also less pungent. But the trade in Cassia oil is declining as synthetic cinnamic aldehyde is available and the oil itself is sold adulterated with cheap terpenes.

The leaves are used mainly as a spice-almost an invariable ingredient of specially the North Indian kitchen. In Kashmir however they also replace *pan* or betel leaves. They find some use in dyeing industry, as clarifiers for dyeing with myrobalans or *kamala*. They are also carminative and used in colicy pains and diarrhoea. The oil from these leaves resembles the cinnamon leaf oil. The essential oil of commerce however is derived from *C. cassia* and is mostly imported from China.

Added to the food, it renders it aromatic and this also strengthens the stomach. It is used as an ingredient of many medicines meant for strengthening stomach, liver as well as other different limbs of the body. It is regulatory to *vata*, promotive of menstruation and expellant of *kapha*. In cases of excessive sweating, running nose and cough this is used alone or along with honey.

Its use is contraindicated in kidney disorders. Excessive use of *taj* is likely to have deleterious effects on the intestines. The generally advised dose is one half a *masha* up to five *mashas*.

The leaves contain an essential oil eugenol, terpene and cinnamic aldehyde. Outer bark of the plant yields on distillation an essential oil similar to cinnamon oil which is of a pale yellow colour. Cinnamic aldehyde is the chief constituent of both *dalchini* and *tejpat*. But there is an enormous difference between the two as noted already.

This is carminative, stimulant, diuretic, diaphoretic (inducing sweating) and a lactagogue, promoting milk secretion. The leaf oil is a powerful stimulant. This is also employed in flavouring sweets and confections.

A compound preparation called *trijataka* is much reputed. This consists of *tejpat*, immature fruits and flower buds of cinnamon and cardamoms and also *pippali*, sugar, raisins and liquorice root, all made into pills. This pill is used in cases of cough, flatulence and indigestion. The pill is rust kept in the mouth where it gets completely dissolved.

Ayurveda regards *tejpat* as tasty, pungent, cold in virility, dry in quality and light in digestion. It augments bile, cleanses throat, and is useful in phlegm, cough, itching, tastelessness and uterine diseases. Tejpat oil is astringent, pacificatory to vomiting and nausea, curative to dental diseases as well as flatulence and convulsions. In cases of haemorrhage, applying this oil mixed with water prevents bleeding.

There is one more species that should be considered here. This is *C. glandulíferum* Meissn or the Nepal Camphor Wood - a large tree of the Southern Himalayas from Kumaon Hills eastwards to the Khasia Hills and Sylhet. The bark here is rough, pale brown, highly scented, with a strong smell of camphor when freshly cut. In the Indian pharmacopea or the official list of authoritative drugs, experts have recommended this as worthy of much more attention than we have paid so far. The wood and the leaves yield a crystalline product which is a d-camphor. This has also been suggested as a possibly useful substitute for the oil of sassafras which is obtained from the root of *Sassafras officinale*, a tree growing in Virginia and Tennessee vally of United States of America. Sassafras oil is costly and used to a large extent in soap making and perfumery.

2. Cinnamomum obtusifolium Nees

Names

In Assamese, this is called *patichanda*; in Bengali, *kinton, ramtezput, tezpat*; in Kumaon, *phatgoli*; in Lepcha *nupsor*; in Nepal, *barasingoli, bhalesinkoli*.

Botany

This is an evergreen tree with all parts smooth and non-hairy. Bark is about 8 mm thick, grey, fibrous but even all over and narrowly fissured; the cut bark colour is greenish white. Leaves are

obtuse on a strong non-hairy stalk; rigidly leathery, non-hairy, shining beneath and strongly 3-nerved. Flowers are white, small on silky and hairy stalks and are arranged in slightly silky as well as hairy panicles in the axils of the leaves or they are crowded at the ends of the branchlets.

This is a tree of the Central and Eastern Himalayas upto 7,000 ft. and also Assam and Andaman Islands.

3. Cinnamomum iners. Reinw.

Names

In Kannada, it is *ellaga, adavi* (forest) *lavangapatre, dalchinni enne* (oil of dalchinni), *kadu* (forest) *lavanga, lavangada yale, lavanga yale;* in Hindi, *darchini jangli* (forest *dalchinni);* in Malayalam, *kat* (forest) *karva, kattu karuvatoli;* in Marathi *ranacha* (forest) *dalchini;* in Tamil *kattu* (forest) *karuvappattai;* in Telugu *adavi* (forest) *lavanga patta.*

This may be called wild *dalchini,* as some regional languages point out.

Botany

This is a tree of about 12 metres tall, with a short thick stem and a large bushy top. Branchlets are non-hairy. Leaves are leathery; white when young, then red and finally deep green. Flowers and their stalks are silky, yellow within, but foul smelling. Fruit is ellipsoid, black, pulpy and blunt.

This is mainly from Malaysia and Indonesia but is also found in the Western Ghats of South India, for instance, the forests of Karnataka.

Medicinal Importance

The seeds are ground, mixed with honey or sugar and given to children in dysentery and coughs; for fevers, they are combined with other drugs.

4. Cinnamomum zeylanicum Breyn.

Names

This has many names in Sanskrit: *bahugandha* (profusely aromatic), *balya* (invigorative), *chocha*, *chola*, *darusita* (white barked or wooded), *gudatvacha* (sweetish bark), *hridya* (pleasant), *kama vallabha* (aphrodisiac), *lata parna*, *mukhashodhana* (purifying to mouth), *nalada*, *patra*, *ramavallabha*, *rameshta*, *surabhi valkala* (fragrant barked), *surasa*, *tamala patra*, *tanutvaka* (bark, thin), *tapinchcha*, *varanga* and so on.

Botany

This is a moderate sized evergreen tree. Its bark is rather thick, smooth, and pale. Twigs are often compressed, youngs parts are non-hairy, except the buds which are finely silky. Leaves are opposite or subopposite, hard and leathery. Flowers are numerous and arranged in silkily hairy lax panicles that are usually longer than the

leaves. Stalks are long. Fruit is 1.3-1.7 cm long, oblong or ovoid oblong, with a minute spine at the apex, dry or slightly fleshy, dark purple and surrounded by the enlarged campanulate or bell shaped perianth lobes.

This is cultivated in widely scattered regions: Western peninsular India, Sri Lanka, Malaysia and elsewhere also in the tropics.

The plant is indigenous to Sri Lanka (specially Galle District of South and Negumbo on the West) and Southern India, and grows in a wild state also in the Western Ghats from Konkan downwards and the tree also occurs in the forests of Burma specially Tennasserim region.

The parts used are: dried inner bark of the shoot from truncated stalks (referred in pharmaceuticals as cinnamon cortex) and essential oil (referred as oleum cinnamomi).

Medicinal Importance

Ayurveda gives a great value for this plant. The bark is bitter, pungent with a strong flavour. It is reputed as an aphrodisiac and also as being worm-destructive. It is useful in *vata dosha*, biliousness, thirst, dry and parched mouth; bronchitis; diarrhoea; itching; diseases of the heart and rectum and urinary complaints.

The oil is styptic (i.e. astringent and healing); useful in loss of appetite and also to correct gas

troubles, vomiting, and belching. It gives an unfailing relief in tooth ache.

The bark has a sharp, hot taste as the yunani physicians consider. They regard it further as a tonic, alexiteric, (counteracting poison), carminative, aphrodisiac and expectorant (i.e. expelling phlegm by coughing out). It causes salivation and is useful in hydrocele (or a swelling containing serous watery fluid specially in scrotum), increased flatulence (morbid swelling due to gas collection), head ache, hiccup and piles. It also strengthens liver. The oil from the bark is carminative, emmenagogue (correcting menstrual disorders), tonic to the liver and is useful in inflammations, abdominal pains, cold in the head and bronchitis.

The bark is aromatic, astringent, stimulant and carminative. It is particularly useful in chest diseases, weakness of the stomach and diarrhoea. It checks nausea and vomiting.

5. **Cinnamomum macrocarpum** Hook

Names

In Sanskrit, this is *tamala patra, teja patra, tvacha* and *tvakpatra.* In Kannada, it is *bhringa, dalchini, lavanga pattre;* in Malayalam, *chochakam, illavannam, karuva, tamala, tvak patram;* in Tamil, *illavanga pattai, karuva, periya* (the bigger) *lavangapattai, siru nagappu, talichappatri;* in Telugu, *lavanga, maga cherulu; moddu*

lavangapatta, talisapatramu; in Uriya, *twokpatro.*

Botany

This is a moderate sized evergreen tree. Branches are slender. Leaves are thinly leathery. Flowers are in clusters that are shorter than leaves. Fruiting perianth is apparently fleshy and broadly funnel shaped. Fruit is large, 2.5 by 2 cm oblong.

This is a tree of the North Kanara district of Karnataka.

Medicinal Importance

The oil from the root bark and leaves is used in rheumatic affections as an external application.

The term cinnamon is applied loosely to mean the bark from several species of the genus *Cinnamomum*, though the true one is *C. zelylanicum*. This latter however does not grow abundantly in India but is imported from Sri Lanka where it grows well in nature and is also much cultivated in plantations. But, the tree is known to exist in a wild state in the Western Ghats from Konkan downwards.

Constituents

The bark contains 2 per cent of the volatile oil, cinnamic acid, resin, tannin, sugar, mannit, starch, micilage, ash etc. The oil is distilled from the cortex and consists chiefly of cinnamic aldehyde which gets oxidised into resin and

hydrocarbon plus small quantities of phelladrine, pinene, linalol, caryophyllene, eugenol etc.

Different oils are prepared from cinnamon such as (i) from the bark (in the Sri Lankan variety) (ii) oil from the leaves (by distillation); this is darker in colour and has a clove like smell and contains 70 to 80 per cent of eugenol and (iii) oil from the root; this is of yellow colour and in density it is lighter than even water.

The Sri Lankan variety is considered the best. It contains more sugar and aromatic principles, the aroma being due to the presence of the volatile oil of cinnamom in the bark.

General Actions

Bark is carminative (capable of expelling gases from the bowels), antispasmodic (counteracting spasmatic viz. involuntary alternate contraction and expansion of the muscles), aromatic, stimulant, haemostatic (stopping bleeding), astringent (inducing contraction of the liver tissues thus aiding in healing) and antiseptic (capable of killing bacteria). The oil however has no astringency according to some but is a good nervine stimulant and acts in large doses as an irritant and a narcotic poison. The volatile oils found are all aromatic.

Yunani physicians consider it as hot and dry of the second degree, stomachic (good for stomach), diuretic, aphrodisiac (a sexual stimulant) and

demulcent (soothing and cooling). They advise its external application in cases of cold, headache, *balgham* or *kapha*, palpitation, dropsy, hiccup, liver complaints and also in diarrhoea. It is a prescribed drug in melancholia or mental depression.

Cinnamon oils are obtained by distillation of the leaves alone and also leaves as well as the bark. The oil from leaf is produced in some considerable quantities in North and South Kanaras of Karnataka State and Malabar in Kerala State for export purposes.

Dalchini is more important as a delicious, aromatic spice than as a medicine. It has carminative, astringent and stomachic properties and forms an ingredient of many medicines prescribed for bowel complaints. It is used externally in nueralgia (nervous pain) and tooth ache.

Ayurveda regards the bark as sweet and pungent in taste, hot in virility, dry in quality and light in digestion. It aggravates *pitta* but is beneficial in cases of poisoning, diseases of the mouth, tastelessness, piles, ozonea (fetid smell in the nose, *peenas*) and cough. The oil is also astringent, promotive of menstruation and beneficial in feeble digestion, convulsions, flatulence, vomiting and tooth ache.

A few of the uses of *dalchini* in modern medicine are as follows: It is employed as a digestive,

stimulative, excitatory to uterus, preventive of bleeding and promotive of white blood corpuscles in the blood. It is particularly stimulative of the mucous lining of the stomach thus promoting rich gastric secretion. Its oil is mixed with sugar and given to prevent flatulence, vomiting and gripings of the stomach. Rubbing the fore-head with this oil prevents head-ache. A cotton swab drenched with 1-2 drops of the oil kept at the teeth will remove toothache. The oil is given to patients of tuberculosis. *Dalchini* contracts uterus. To augment uterine contraction during labour this is given along with *pipal mul*. In excessive menstruation this is given with opium.

Dalchini as Available in Bazaars

Dalchini is a tree that grows in the Himalayas, Sri Lanka and Malay Archipelago. It is a medium sized tree which is evergreen. It is the bark of the tree that forms the spice of the market place. The bark is somewhat thick, slippery and dull coloured. Normally there are four different materials available in the market under the name of *dalchini*.

(i) *Chinese dalchini*: This comes from China. It is sold in tied bundles, each bundle being of one *ratal* (2.1/2 *sers*) in weight. Its bits are of dull *khaki* colour and the barks are very oily. Cinnamom oil is extracted from them and the barks as such are also used as medicinal drugs.

(ii) *Taj*: This comes from Southern and Western parts of India. It is the bark alone that is utilised as a drug, here. No oil is extracted.

(iii) *Ceylonese dalchini*: This comes from Sri Lanka. it represents the inner bark of the tender twigs of the tree there that are cut down. This *dalchini* is thin, reddish brown in colour and strongly fragrant. Oil is extracted from it and the barks are also employed for extraction of oil.

(iv) The bark of *tamala*: Though this is a totally different species viz. *C. tamala* (or *tejpat*) unlike the true *dalchini* which is *C. zeylanica*, the bark of this tree is also called *dalchini* and is actually available in the market under that name.

Of all these four "Varieties", it is the Chinese and the Ceylonese varieties that are the best.

Dalchini is sold in the bazaar under two trade names: *lakadi dalchini* or woody *dalchini* and *pahadi dalchini*, the hill *dalchini*. *Patri dalchini* or the leafy *dalchini* is the name given for the Chinese *dalchini*. *Lakadi dalchini* is the name given for the *taj* and the *tamala* bark and *pahadi dalchini* is the name for the *jangli dalchini* or the forest *dalchini*. The Ceylonese *dalchini* is not much available in India.

As it happens, Cinnamon is largely sold in the market in the form of long slender sticks containing in turn numerous smaller pieces called quills which are quite thin and brittle. These latter are often marked with longitudinal striations on the inner surface. Cinnamon is frequently adulterated with a roughter, thicker and less aromatic bark from what is pharmaceutically called Cassia lignea, which actually is the bark of

another species of *Cinnamonum* altogether viz. *C. tamala.*

Medicinal Uses

Yunani physicians extol the uses of *dalchini* very much. The mode of action is explained as follows. They consider it as a drug material that sustains the strength of a person always. Since it is much mucilaginous, as soon as it enters in the body, it spreads everywhere and enters the blood. By virtue of its own innate heat, it establishes an equableness all over the body. It will dry up all the vitiations of the body, scatters them out and does not allow the development of foulness anywhere. This is also an excellent-material in promoting the lust and interest in sex. It promotes the digestive fire, purifies the blood; it is good for brain and regulates urinary function as well as menstrual flow to their normal rhythms.

This should not be given to the pregnant as it causes a fall of the foetus.

It brings about a headache if consumed by persons of hot or *ushna* constitution.

Its excessive use is also likely to be harmful to the kidneys and the bladder. The generally advised dosage is: three to six *mashas* of the bark or upto five drops of the oil.

The powdered cinnamon bark promotes an astringent benefit whereby the cellular elements of the region of application contract, heal up and

expel waste materials. It is this self cleansing efficacy of the cinnamon that makes it a much revered and valued medicine in the Tebetan monasteries.

Dalchini is principally the bark of young shoots. This itself is prescribed in the form of infusion, decoction, powder or oil in many complaints of the bowels such as dyspepsia (indigestion), flatulence (bloating due to gas), diarrhoea and also vomiting. It is frequently utilised as an adjunct drug along with bitter tonics, purgatives as well as vegetable and mineral astringents. This has a reputed application in menorrhagia and also in difficult labours that are due to defective uterine contractions.

Powdered cinnamon in 10 to 20 grains as the dosage is an esteemed remedy in diarrhoea and dysentry.

The crystalline cinnamic acid is a counteracting remedy for tuberculosis and is also used as an injection in pthisis or tuberculosis of the lungs. An oil emulsion containing five per cent of *dalchini* is given as an injection again, along with the yolk of an egg in lupus or cutaneous tuberculosis.

Cinnamon is a powerful and beneficial stimulant given in cases of cramps of the stomach, enteralgia (or the pains in the intestine), tooth ache and paralysis of the tongue. The oil as such is used advisedly for local application in nuralgia (nervous pains) and headache.

As an antiseptic and germicide it is used as injection in cases of gonorrhoea and typhoid fever. It was also used with success in treating cancer patients.

Externally cinnamon oil has many famous uses: in rheumatic pains, neuralgia, headache and tooth ache, as it is most well known. It is a good strengthened of the gums and a perfumer of breath. Cinnamic aldehyde is cheaper than cinnamon oil. As such, it finds a great commercial value in being the ingredient of chewing gums and chocolates, specially in Sri Lanka.

Cinnamon as a Home Remedy

Dalchini is a very common ingredient of the Indian kitchen store. As such, there are many common and very useful remedies using this valuable spices.

A few of them are listed below.

Take 1 drachm of cinnamon powder, 4 drachm of *harad* (chebulic myrobalan) powder, and 4 ounce of water. Boil this mixture for ten minutes. This forms a good aromatic purgative.

Take 10 grains each of ginger, cinnamon and cardamom. Powder them all together. This constitutes one dose to be taken before meals. This relieves indigestion and flatulency or bloating due to gas collection.

Take 1 drachm of cinnamon, 10 grains of clove, and 30 grains of ginger. Boil in one *ser* of water for

15 minutes. The dose advised is two ounces every three hours. This is good for influenza.

Take 1 drachm of cinnamon, 1/2 a drachm of anisum seed, 1 drachm each of *mulethi* or liquoice root, and raisins without seeds, 3 drachms of sweet almonds, 1 drachm each of bitter almond without rind and white sugar. Powder them all together and prepare a pill mass. Divide this into pills of 5 grains each. Dosage is one pill at a time but several times a day. This is good for cough.

Grind a few bits of the *dalchini* bark in lemon juice and apply the paste to the temples of the head. This will remove painful headache. The same paste proves effective in curing the pimples.

Prepare a decoction by boiling half a tea spoonful of powdered *dalchini* and a pinch of pepper grains in a cupful of water. Add honey and administer three times a day. This is a sure cure for sore throat, inflammations and wounds at the throat, common cold and also for indigestion, influenza and malarial fever.

The distress of the labour pain after child birth will get greatly relieved by a drink of the cinnamon decoction. By consuming a pinch of cinnamon powder daily at night for a month altogether would postpone the reappearance of menstrual flow as much as possible.

If one is passing urine many times during the day, consuming a pinch of cinnamon powder daily at night, mixing it with honey will prove beneficial.

This acts as a remover and expeller of phlegm in the complaints of bronchitis and asthmatic attacks. A regular use of this powder promotes the power of memory. Nervous debility will become overcome this way.

Of the other species of cinnamomum in the list given at the beginning, none are called as *dalchini* or *lavanga patte* or *tejpat* in any regional languages and hence are rather irrlevant here. But they do have other points of importance *C. camphora Nees* (commonly cultivated in India, China and Japan) is the camphor tree. *C. glanduliferum* Meissn (of Central Himalayas and Khassia Hills) is a good substitute for sassafras from North America whose oil is much medicative; this is called Nepal Camphor wood. It is a lofty tree whose wood and leaves are used; these yield a d-camphor and an essential oil. This is a good stimulant and a carminative. *C. malabothricum* is called the country cinnamon or *jangli dalchini*. Bark is used in curries and condiments. Dried buds are employed with various combination in diarrhoea, dysentery and cough.

E. CARDAMOMS

From very early times cardamom that refers to the dry thin walled capsule of several tropical plants of the ginger family (Zingiberaceae) bearing strongly aromatic seeds has been a highly valued spice of the orient. 1. *True Cardamom* which is botanically called *Elettaria* (coming from the Sanskrit word

'Ela') *cardamomum* Maton is a native of India. It is indigenous to Western and Southern India being found wild in the rich moist forests of the Coastal Karnataka as well as Travancore and Cochin in Kerala State. It is also intensively cultivated there in the tea and rubber estates and along the gullies and trenches of coffee plantations of Coorg as it thrives best in damp shady places. The plant occurs wild in Sri Lanka, Burma and Malay Archi pelago. The source for most such plantations is however believed to be India ultimately. It is now grown in large quantities in the moist forests of Central America, particularly Guatemala. Several varieties of the true cardamum are available in the market.

The plant shows quite an amount of variation under cultivation, and the consequent naming of the varieties after the place of their respective cultivation has been an important reason for confusion in their identity. Two varieties are based on the size of the fruit. (i) *E. cardamomum* var. *major* refers to the wild indigenous cardamom of Ceylon or the Greater oblong Cardamom or the Long Cardamom and (ii) *E. cardamomum* var *minor* refers to all the cultivated races, particularly those known as Malabar and Mysore cardamom. This however includes a large number of races differing in the size of the plant, the nature of the leaf surface, the features of the flowering panicles and also the fruit capsules. But all of them are interfertile and the great amount of variation noticed is mainly due to intensive cross breedings.

Mysore variety is suitable to elevated areas, while Ceylon's indigenous cardamom is a robust variety of the wet forests of Sri Lanka and has been successfully introduced to South India. There is a type called *mysorensis* common throughout India and another growing in the cardamom estates of Manjarabad near Mysore designed as var *laxiflora*, with loose panicles.

Cardamom cultivation is always attended with much care; infact, among the spices, there are almost none equal to cardamom in the care bestowed on its handling. Cardamoms are a favourite masticatory (i.e. a spice that is chewed) in India. They are extensively used in sweet preparations such as *kheer*, confections, *halwas*, curries, pickles and innumerable dishes, sweet as well as savoury to impart the characteristic aroma. They also find some application in medicine. Cardamom oil has some uses in cooking and in flavouring beverages.

Early European physicians speak of five varieties of Cardamoms (i) Ceylon wild, much used by them (ii) Round Cardamoms coming from Java, Thailand and China (iii) Bengal Cardamoms (iv) Nepal Cardamoms and (v) Winged Cardamoms, where the capsules have wing like expansions.

Names

Naturally this plant has a large number of names in Sanskrit many of them quite significant

and revealing. They are *bahula; bhringa parnika; chandra bala; chandra sambhava, chandrika, chhardikaghna* (destructive of vomiting), *dravidod bhava, dravidi* (born in the South, *dravida* regions); *ela; gandhakutt; gandhaphalika* (with fragrant fruits); *gaurangi, kapotavarni; kshudraila* (the smaller *ela* fruit); *sugandhi, sukshmaila* (the slender *ela*); *tikshna gandha; upakunchika, triputa, truti.*

This is called *elaichi* or *ilaichi* in Bengali, Hindi and many regional languages; *elakki* in Kannada; *elakkay* in Tamil and *elakkaya* Malayalam.

Botanical Aspects

Cardamom is a perennial, evergreen bushy herb with thick, fleshy, branching rootstocks or rhizomes (as in ginger) and leafy stems growing to a height of 4 to 8 feet. It has a long branched inflorescence or panicle that arises near the ground level. The stem is clothed below with spongy leafy sheaths. Leaves are almost stalkless, 30-60 by 7.5 centimetre broad and oblong-lanceolate in shape. Panicles are several to one per a leafy stem, 30-60 centimetre long. They bear bracts i.e. leafy structures along with flowers and these are also linear and oblong and they persist for long. The lip of corolla is white and is streaked with violet markings. The fruit is subglobose or oblong, about 13 milimetre long and marked with many fine verticle ribs. The fruits are borne in bunches.

The capsular fruit is somewhat triangular or three sided, rather pointed towards the tip and somewhat rounded at the base. The fruit wall is like paper, thick and almond coloured, on the surface of which the vertical lines are clearly discernible. The fruit is tasteless. The seeds inside are many, characteristically aromatic, hard, some what triangular but not pointed and slightly wrinkled. These are reddish black on the surface and whitish inside. The fragrance they have is delicate and very charming. The taste is bitingly pungent in a way but full of fragrance. After eating these grains, mouth experiences a sense of coolness. The seeds get spoiled if they are exposed to air. Therefore the capsules are never opened until needed. Inside the capsular coat the seeds can retain their quality and virility for three years duration. Fresh, big and strongly aromatic cardmoms are considered the best.

Constituents

The seeds contain a fixed oil, an essential aromatic oil - the active principle (four to eight per cent), considerable amount of terpinyl acetate, cineole, free terpinol and limonene; potassium salts, starch, nitrogenous mucilage, an yellow colouring matter, ligneous or woody fibre and ash containing manganese.

General Actions

The smaller variety removes *kapha*; it is cold in its virility and is useful in cough, breathing difficulty, impotency and difficult urination.

Medicinal and Other Uses

Cardamom is an article of some considerable commercial value. It is exported largely to foreign countries where its use as a spice is much prevalent specially as a flavouring agent for sweet meats, beverages and liquors. In the Middle East, cardamom is much used to flavour coffee.

In medicine it is used mostly as an adjunct to other carminative medicines. But its use is officially recognised in the authoritatire Pharmacopoeas of both the United States of America and the Great Britain. They use it as carminative, stimulant and flavouring agent. Cardamom oil is employed in medicine as well as perfumery industry. From times immemorial in India cardamom has been used to render sweet preparations and beverages, fragrant. Ayurveda also uses this to improve the quality and the taste of most of its medicinal preparations such as powders, pills, confections and so on. All cardamoms are powerful aromatics, stimulants and carminatives. They are also excellent stimulants and stomachics. These actions are all due to the essential oil within them.

Cardamom is a safe carminative and can be employed well in convalescent stages following diarrhoea.

In the form of tincture i.e. spiritious liquor preparation, cardamom is advisedly used in both Western and Indigenous systems of medicine as a

frequent adjunct to other stimulants, bitters and also purgatives.

A popular and domestic remedy to get relief from giddiness caused by billiousness or *pitta* is to prepare a decoction of cardamoms together with their fruit wall, add jaggery and administer this as a drink.

A powder made of equal proportions of parched cardamom seeds, anise seeds and caraway seeds is given in one teaspoonful doses as a good digestive. An excellent stomachic powder is prepared by grinding together equal amounts of cardamom, dry ginger, cloves and caraway.

To check vomiting, a compound powder is made from cardamom seeds 5 parts, resin of *Shorea robusta* 2 parts, *Cyperus rotundus* or *musta* 4 parts, red sandal wood 2 parts, long pepper 3 parts, cloves 2 parts and *nagakeshar* or *Mesua ferrua* 1 part.

There is a proprietory preparation or *yoga* called *eladi churna*. This is made up of cardamoms 1 part, *dalchini* 2 parts, flowers of *Mesua ferrua* 3 parts, black pepper 4 parts, fried borax 5 parts, long pepper 6 parts and sugar equal to their united measure viz 21 parts. This is a good nutritive tonic and demulcent (cooling and soothing), being useful in bronchial affections. This is given in doses of 5 to 20 grains three times a day.

Yunani physicians consider this as hot and dry for the second degree. They recommend it alone or

along with water to be chewed so as to secure a fragrant smell, and a sense of well being. This is best in stomach pain, due to *vata* indigestion and flatulense. It strengthens heart and keeps the mind and temperament gracious and pleasant.

Cardamoms are harmful to patients of chest and lung diseases.

Modern medicine considers that employing cardamoms is beneficial in those diseases of digestive tract that have rendered it weak or inflammed. If there is less secretion of intestine or there is disorder in bile secretion, cardamoms are advised.

Another area where using cardamom is highly beneficial is in cases of neuralgic pains. Here 15 *rattis* of cardamom are given along with 2-3 grains of quinine. A summary of the Ayurvedic and Yunani opinion on cardamom can be stated as follows: Ayurveda regards the seeds as bitter, cooling, pungent and richly aromatic. They cause billiousness. They also act as counteracting poison, but cause abortion. They clear mouth, and are pleasing to heart and good to brain. They are useful in asthma, bronchitis and consumption and the diseases of throat. They are useful in scabies and pruritis among the skin affections. They are employed beneficially in the diseases of kidney, bladder and rectum. Yunani physicians regard them as fragrant, stomachic, laxative, diuretic and carminative. They act as tonic to the heart, lessen inflammations and are useful in headache,

toothache and ear-ache as well as in liver complaints and those of the chest and the throat.

Both the root and the fruit are Cambodian medicines also. The root is used for its laxative and tonic properties. The fruit is considered tonic, stimulant, stomachic and emenagogue- correcting menstrual disorders. Internally it is given in liver diseases and uterine complaints. Externally it is applied to the tumours of the uterus.

Excess use of cardamom is harmful to the chest and the lungs. *Vamshalochan* or bamboo manna and the bigger cardamom however counter the deleterious effects.

Cardamom as a Household Remedy

Some of the household tips for using cardamom in many further profitable ways are as follows:

If one chews well a few grains of cardamom and gulp them in finally, mouth will remain fragrant for a long time, the distress of thirst will be overcome and the food taken in will get easily digested.

In case any poisoning is suspected, eating a few grains of cardamom before meals is safe and a good preventive measure.

Chewing these grains well and gulping in, will ward off stomach upsets, dizziness of the head and oozing of water in the mouth as well as the tendency to vomiting. Another measure to overcome dizziness and avoid vomiting tendency is

to take the cardamom powder in a glassful of lemon juice.

Gulping in a whole cardamom along with its husk and keeping it within a morsel of well ripened banana fruit and to do so daily before one goes to sleep in the night proves beneficial in constipation, indigestion as well as piles.

Drop a pinch of cardamom powder in a glassful of milk and boil well. Add to this milk a spoonful of honey or powdered sugar candy. Consuming this milk daily at night is condusive to developing excellent memory and warding off burning sensations during urination. This is also a good aphrodisiac.

Adding a pinch of cardamom powder to a decoction of cumin seeds and to keep consuming a cupful of it will remove the distress of liver complaints, stomach upsettings, vomiting and dizziness.

A hot cup of tea prepared with an addition of cardamom powder proves much welcome and is also beneficial for tiredness in the body, dysentery, diarrhoea, obstructed urination and burnings accompanying urine flow.

Drop three to four pinches of cardamom powder into a cupful of tender cocoanut juice, add two spoonfuls of honey to it and take in. This will stop vomiting. In case however, vomiting is too violent, adopt this measure thrice a day for two to three days. That will give an excellent result.

Warm up cardamom seeds, throw them along with a small amount of mastich gum (*mastagi* in Hindi—a kind of fine resinous gum excreted from the trees of *Pistacia lenticus* Linn, a type of *pista*) in a glass of boiled milk and take a small bout of it inside. This will quieten the burnings associated with urination.

Prepare a powder of the seeds of cardamom and *pipalmul*. Mix the product with ghee and use it as an electuary i.e. to lick up as a medicine. This wards off heart diseases due to *kapha*.

Give cardamom seeds along with the seeds of cucumber. This proves very beneficial in cases of stones in kidney and bladder.

Grind down the cardamom powder to a fine consistency. Sniffing this will induce a good sneeze and this would also relieve headache.

If you are troubled by indigestion due to a heavy consumption of banana fruits, chewing a few grains of cardamom will set the matter right.

In general, cardamom proves beneficial in cases of all those diseases of digestive tract where a burning sensation is predominant or there is an over all laxity. They are also advised if there is a scantiness in intestinal secretion and if biliary i.e. liver secretion is not satisfactory.

In nervous pains, giving fifteen *rattis* of cardamoms mixed with two to three grains of quinine proves highly profitable. Cardamom seeds are the best masticatories (a flavouring spice), but

used only to some extent in Europe while the greater use there is for sweetmeats. Its oil extract is however used well in medicine as well as perfumery.

The need for considering after cardamom now a few *Amomum* species, as below, - a totally different plant, arises because of the following reasons: they are regarded and used as Bigger cardamoms; the action and use are more or less the same; more importantly, the genus *Elettaria* has only one species viz. *cardamomum*, though this shows many variations under cultivation, while the genus *Amomum* has 100 species many of them (nearly 45) not still investigated and thus offers a potential wealth worthy of being given greater attention than we have bestowed upon them till now. Of these many species four occur in India and three of them are considered as some type of cardamoms in our regional languages. They are as below.

Several species of *Amomum* enter into the Malaysian medicine.

1. Amomum xanthoides wall

Names

This is known as *elach* in Bengali, *ilaichi* in Hindi; *elachi* in Marathi; *elam* in Tamil; *elakulu* in Telugu; *so sha mi* in Chinese and *sai yin* in Malay.

Botanical Description

This is a herb with the leafy stem growing to a height of 1.5-1.8 metres. Leaves are smooth, non-

hairy, firm and bright green. Spikes have but a few flowers and are globose. Corolla tube has a lip which has an orb like blade that narrows suddenly to a broad claw.

Medicinal and Other Importance

The seeds are stimulant and carminative and are useful to all affections in which the common cardamoms are effective. They are particularly useful in securing relief from gripes and tenesmus or ineffectual and painful straining to relieve the bowels and even some cases of dysentery and frequency of motion. For this purpose the seeds are always powdered and given with butter.

Chinese use the seeds as a condiment very much like the true cardamoms. They also employ them as tonic, stomachic and carminative efficacies.

2. Anomum subulatum Roxb. The Greater Cardamom

Names

This has many names in Sanskrit: *aindri; indrani, balavati, brihadela, bhadraila* (the bigger and the auspicious ela); *charmasambhava* (referring to the leathery capsular wall?); *diwyagandha* (divinely fragrant); *ghritachi, goputa, kanta* (pleasing) *kanya kumari, kayastha; maleya* (from Malaya?), *sthulaila* (the stout *ela*), *triputa.*

It is called *bara elaichi* in Bengali; *moto ilachi* in Gujerati; *bari ilachi* in Hindi; *dodda elalkki* in Kannada; *motivelode* in Marathi; *kattu elam* (the forest *ela*), *periya elam* in Tamil; *pedda yelakki* in Telugu; *illayachi kallan* in Urdu; *brihadupa kunchika, sthulaila* in Uriya.

This is the bigger cardamum of most regional languages.

Botanical Aspects

This is a herb with leafy stem smaller than the above plant and reaching to a height of 0.9 to 1.2 metres only. Leaves are oblong lanceolate, green and smooth as well as non-hairy on both the surfaces. Spikes are globose, very dense. Bracts are red-brown. The outer ones have a horny cup while the inner ones are shorter. The lip of the corolla tube is obovate and wedge shaped with the lip deeply notched, yellowish white and rather longer than the other corolla segments. Capsules are big, 2.5 centimetres long, globose, red-brown and densely but minutely spiny.

This is a native of the Eastern Himalayas and believed to be indigenous to Sikkim. This is infact a very promising spice crop of Sikkim and is grown in extensive plantations there and to a small extent in the Darjeeling Hills of West Bengal. The capsules here are large, triangular and with a reddish brown tinge and the seeds are also numerous and dark brown. The plant type is also quite different from the smaller and the true

cardamom, being a perennial herb with underground rhizomes which are the *real* modified stems and aerial leafy shoots which are the *false* stems. The leaves grow upto 2.5 metres. The flower cluster is a spike and the flowering stalks arising from the base of the stem are short. In Sikkim there are three cultivated varieties of this species besides some other local wild varieties also known as *churumpa*.

This has an extensive market specially in North India and represents one of those highly potential sources of future wealth if properly exploited and cultivated elsewhere as well. Some cultivation is no doubt practised in the South also near the hills of the sea coast. But it is necessary that we should give greater attention to this valuable herb than we have so far done.

Medicinal and Other Importance

Parts used are the seeds and the essential oil extracted from them which is rich in cineole and is of medicinal value besides being important in flavouring. Seeds are somewhat feeble in taste and aroma but their fragrance becomes much evident when crushed. When fresh the seeds occur within the fruit enclosed together in a viscid sweet pulp which however gets liquified when the fruit is fully mature. Seeds retain their quality for two years when they are within the fruits and for one year when they are separated from the fruit wall.

Seeds are aggreeable, aromatic stimulants and are much used for flavouring, specially the savary and the pungent preparations but also for the sweetmeats. Because of their cheapness they also replace true cardamom sometimes.

Seed is a good stomachic, specially used to calm down the irritation produced by cholera and such other affections. It is also stimulant and carminative. Its decoction is a beneficial gargle in the affections of gums and teeth. In cases of stones and gravels in the kidney it is used in association with the seeds of melon. It has proved of much value in those ailments of digestive tract where there is scanty intestinal secretion. It promotes elimination of bile and is thus useful in liver complaints—specially the congestion and the abscesses. It is given then in doses of 10 grains. It is given beneficially in neuralgia in larger doses of 30 grains along with quinine.

This is a common ingredient in both Eastern and Western medicine for many preparations of stimulants, bitters and purgatives and it is employed either as powders or tinctures. Sometimes the oil is used to pacify inflammation of the eye lids.

F. NUTMEG AND NUTMACE

Nutmeg and nutmace are both procured from a handsome tree botanically called *Myristica fragrans* Houff of the family Myristicaceae. This is a native of Mollucca islands or Spice Islands but now grown

in many tropical regions for instance in Mauritius, Madagascar, Seychilles, Zanzibar and the West Indies. It is a popular spice now but probably not much known in the early times. This had reached Europe however by twelfth century. Upon the discovery of the Spice islands in 1512 A.D., the Portuguese secured a monopoly of its trade. This was wrested then from them by the Dutch. Later on, some of these trees were smuggled into French and British Colonies and the monopoly was broken soon after, when cultivation flourished in the new areas.

Nutmegs are not much used medicinally but the volatile oil procured from them enters into several important and widely utilised pharmacopoeial preparations like spiritus ammoniae aromaticus, tinctura valerianae ammomiata and so on.

Several species of the genus *Myristica* are found in India, in the Nilgiris and the Malabar Coast. From the ancient records it appears that nutmeg tree flourished in India once. A Portugese physician Garcoa de Orta had found a luxuriant tree of nutmeg in India in sixteenth century itself but the trees are never found in abundance anywhere in India. The Malabar nutmeg is a different species viz. *M. malabarica* and this is available in India but this does not possess the delicate aroma of the true nutmeg.

It should be noted however that with a little better attention to nutmeg cultivation, India can

easily avoid its import altogether as it does now and infact can be easily in a position to export this important crop. Some promising trends are seen towards this end of late in Kerala; much encouragement is being given there for growing them even in house gardens. The tree can be easily cultivated near the sea along the East and the West coastal areas. The economic importance of nutmeg oil is very great. USA imports nearly thirty crores of pounds of oil annually, while India imports about six lakhs worth.

The family Myristicaceae consists of only one genus *Myristica* and 85 species, all distributed in the tropical regions of the Old World.

They are evergreen trees often having star shaped hairs. Leaves are alternate, entire, often gland dotted. Flowers are small, unisexual, male and female flowers found in separate plants. They are clustered in fascicles, umbels or panicles. Fruit is more or less fleshy or thickly leathery, often splitting into two (rarely four) valves. Seed is erect, enclosed in a fleshy or membranous *aril* that is entire or mostly much dissected, usually highly coloured and often strongly aromatic. This *aril* constitutes the nutmace while the hard thick seed within is the nutmeg.

Medicinally the plants of this family are aromatic stimulants. Which is given below :

Myristica fragrans Houtt. Nug meg, Mace Tree.

Names

Sanskrit offers a large number of names: *ghatastha; jaiphala, jati, jatikosha, jatiphala; kosha, koshaka; mada shaunda* (intoxicating); *majjasara, malatiphala, rajabhogya* (fit for the kings); *shaluka.*

This is called *jayphal* in Hindi; *adipalam, jati, kayi* in Tamil, *jaji, jaikayi, jaji patre* in Kannada and Telugu; *jati, jatikka* in Malayalam.

Botanical Description

This is a handsome, evergreen and lofty tree reaching to a height of 30 to 60 feet, with slender branches all around and dark green leaves. It is normally dioecious (viz. there being separate male and female plants) with small pale yellow flowers, that are fleshy and fragrant. Leaves are leathery, elliptic oblong, base is acute, pale yellow brown, paler with red brown nerves, beneath. Nerves are about 8 pairs. Fruit is ovoid, sub globose or pear shaped. The ripe fruits are golden yellow and resemble plums are apriocots. They gradually dry out and when fully ripe the husk splits revealing the shiny brown seed and the bright red branching veil like cover of the aril, enclosing it. Inside the seed is the kernel which is the nutmeg while aril forms the nutmace.

The tree is propagated by nursery saplings. They come into age when about 20 years. Alter this long delay however it continues to yield for 30 to 40 years. And, the yield is very high, a large tree

furnishing about 1000 nutmegs annually. Moreover the fruits develop through out the year. After the husks split open, the fruits are picked, the husk is removed and the mace is stripped, flattened and dried when it turns yellowish brown. The seeds are also dried separately and the shell cracked, the kernels are removed, sorted and often treated with lime to prevent insect attack.

Medicinal and Other Uses

Nutmace is one of the most delicately flavoured material among the spices and is much used in savoury dishes and also in making pickles, ketchups, sauces and curries.

Nutmeg is a choice spice for many of the luxurious puddings, custards and other sweet dishes, *palavs* and also various beverages. A delicious jelly is made out of the husk of the ripe fruit. Nut meg oil is used in aperient (i.e. laxative) pills and other preparations to prevent griping and is also given in sugar as a stimulant and a carminative. The oil however contains a highly toxic substance called myristicine and can therefore be used only in small amounts. Caution must always prevail in the use of both nutmeg and nut mace as they are also intoxicating to some degree.

But the aromatic and volatile nutmeg oil is a highly prized article in soap and perfumery industry. Nutmegs also contain a fixed, non-evaporating oil known as Nutmeg butter in

commerce. This is an yellow fat found in the seeds of nutmeg and allied species in about 40 per cent and this has a flavour and consistency of tallow or animal fat i.e. specially that of ox or sheep. Nutmegs that are unfit for use in spice trade are roasted, powdered and the oil is extracted between metallic plates. Several varieties of Nutmeg butter are available in the market. They are all used in making ointments or candles. Nutmace also yields a similar material.

Constituents

Nutmeg contains a volatile oil 2.8 per cent, a fixed oil, proteins, fats, starch, mucilage and ash. The nutmace has a volatile oil 8-17 per cent of the same nature as found in the nutmeg, a fixed oil, resin, fat, sugar, dextrin and mucilage. The fixed oil forms the numeg butter and consists of myristicin and myristic acid and a small percentage of the essential oil. The latter contains myrisiticin and myristicol and is of an yellow colour.

Action in General

Nutmeg is aromatic, stimulant and carminative. It is narcotic (i.e. intoxicating) in large doses. The fixed oil is used as a rubifacient i.e. a reddener of skin, while the volatile oil is stimulant, laxative and carminative. The nutmace is carminative and aphrodisiac, Hakims praise the nutmeg as stimulating, intoxicating, digestive, tonic and aphrodisiac, increasing the urge of sex.

Ayurveda regards this as of pungent taste, hot in virility, light in digestion, appetising, stimulative, astringent, good for voice and mouth and useful in vomiting, breathing difficulty, diseases of the heart and impotency.

Yunani physicians regard this as hot 2nd degree and dry 3rd degree. Nutmeg is stomachic, aphrodisiac, and useful as a uterine tonic as well as in vomiting, hiccup and inflammation. Nutmace is hot 2nd degree and dry 2nd degree. It is stomachic, digestive and carminative and is useful in diarrhoea, consumptive fevers and as an aphrodisiac.

Uses

As a spice, nutmeg is closely allied to cloves and cinnamon bark (*dalchini*) to which this may be substituted.

There is a considerable range of medicinal uses also besides its major use as a spice.

A compound powder made up of 5 grains each of nutmeg and ginger and 10 grains of caraway seeds constitutes a good carminative best taken before meals.

It is mostly employed as a flavouring adjunct in culinary and medicinal preparations in Europe. The Chinese use nutmeg more as a medicine than as a spice; they use it as a carminative, stomachic and antispasmodic drug, specially suited for the

children and the aged. In Cambodia, the nutmeg is a remedy for looseness of the bowels.

Half a drachm of nutmeg powder in milk cures diarrhoea of the summer seasons. This can also be given beneficially for such cases of delirium tremens and insomnia where opium has failed and chloral the other drug for this purpose is contraindicated. This may also be used as a carminative in convalescence after diarrhoea.

The fixed oil of nutmeg is used in mild cases of ringworm and is added to pomades to stimulate the growth of hairs. Mixed with a sweet oil it makes a good liniment for chronic rheumatism, paralysis of limbs and sprains.

Household Remedies

In many Indian kitchens nutmeg and nutmace are also stored though not so commonly like ginger and turmeric or cloves and cardamom. Mostly they are used along with betel nut while taking betel leaf.

However there do exist a few household remedies with nutmeg as the principal ingredient. Some selected examples are as follows:

It is a common practice to use broken bits of nutmeg and nutmace along with *supari* powder. This is stimulative of sexual urge. Nutmeg powder taken with honey is presumed to be particularly effective here. Such a *supari* also promotes digestive strength. Consuming nutmeg powder

along with ripened banana fruit will stop loose motion that is due to indigestion. A very good use of nutmeg is as follows. Add a pinch of the powder of the nutmeg in a spoonful of the juice of *amalaka* (Emblic myrobalan) fruit. Consume this thrice a day for a few days together. Appreciably noticeable benefits are seen thereby but gradually, in patients of indigestion, persistent weakness and disinterest in all daily routines, mental excitement, insanity, forgetfulness and also hiccup. It is important to note however that using nutmeg in an over dose is always attended with deleterious effects.

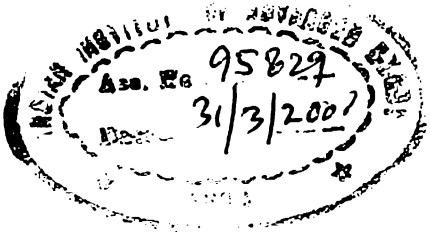
Powder the nutmegs very well and cook this powder in gingiley oil. Massaging with this oil will remove shooting pains of headache and the excruciating pains of the joints. This medicated oil is beneficial for curing even very long standing and indolent ulcers and wounds, that have not responded well to other treatments.

Take a pinch of nutmeg powder. Place this inside the pulp of a well ripened banana fruit and eat. This is an effective measure to stop loose motion that takes place following indigestion.

Nutmace or Jayapatri

Giving nutmace keeping it in the betel leaf is useful for asthmatic bouts due to phlegm or *kapha*. This is usually added to drugs meant for augmenting virility in man. In chronic intestinal diseases that are highly emasciating to the body it is beneficially given upto 6 to 10 *rattis* in a dose.

This is warmed up in fire and given with profit in cholera. Nutmace should not be given in excess. A dosage more than 3 to 4 *mashas* will give an intoxicating effect and may also cause loss of consciousness. To obviate the deleterious effect of the over dose of nutmace, employ butter, sandal wood and sugar candy as an electuary or a *lehya*.



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