

Health Series

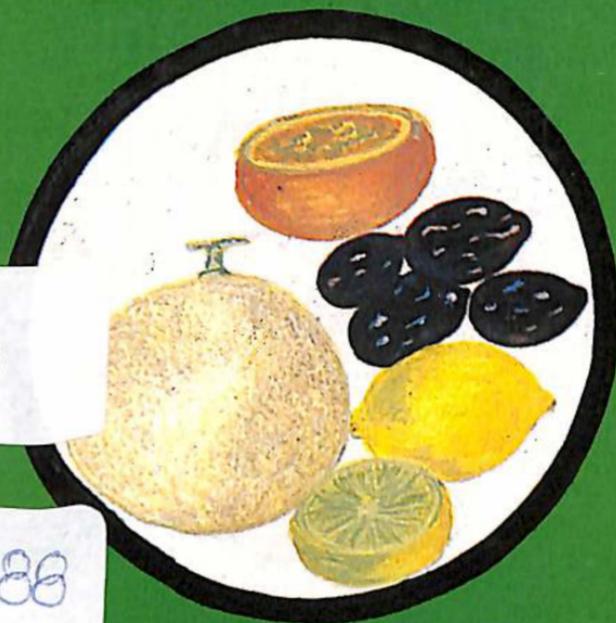


Traditional Family
Medicine

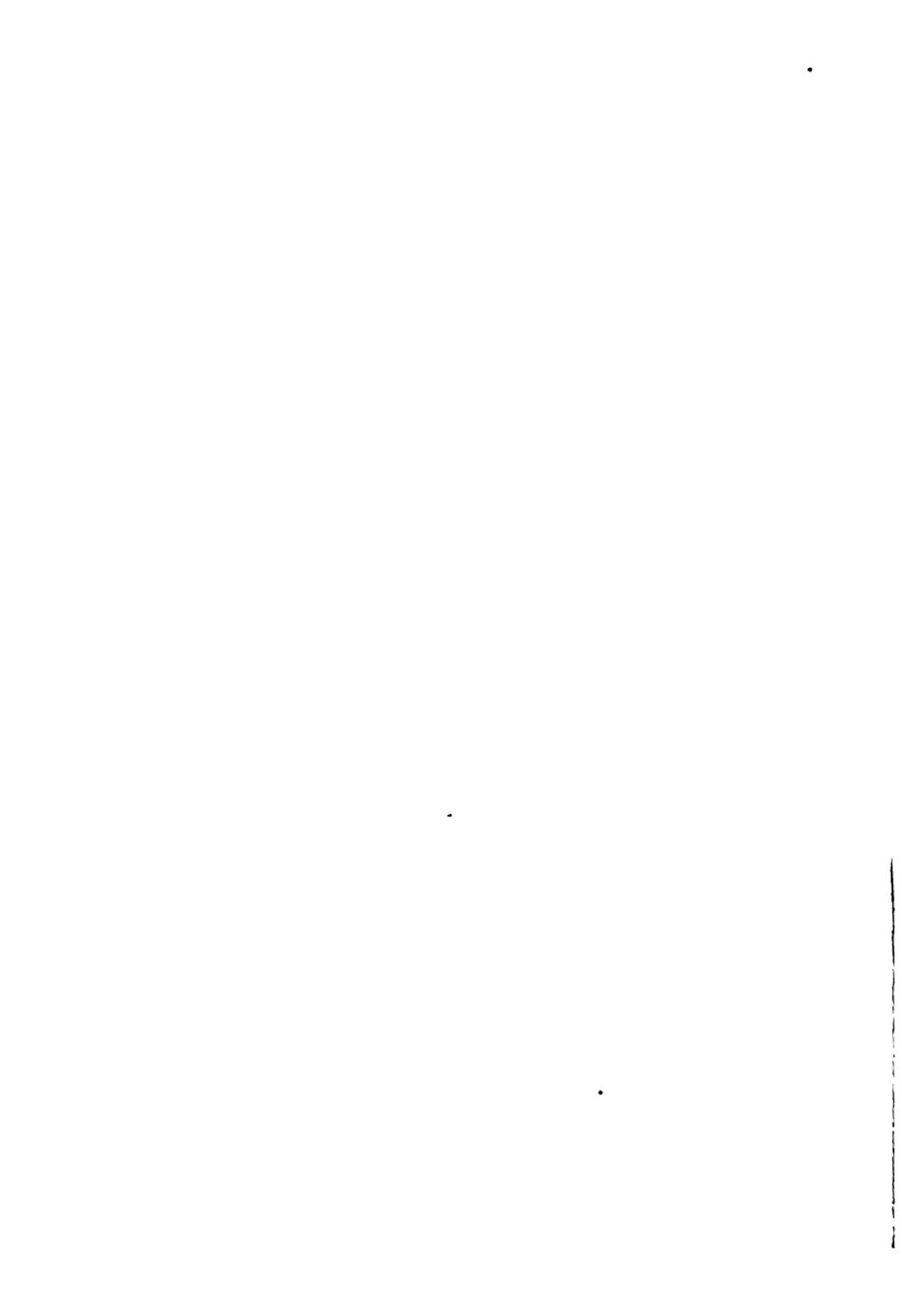


Bael, Wood Apple, Lemons, Castor

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HEALTH SERIES :
TRADITIONAL FAMILY MEDICINE

Bael, Wood Apple, Lemons and Castor

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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

There is not much of a doubt with respects to some famous medicinal plants that their value in health and therapy were first discovered in India and also utilised well. Bael, wood apple, lime and castor probably belong to this category. Of these, bael, wood apple and lime (among the citrus fruits) are believed to be botanically even, indigenous to India. While with reference to castor however though it is most probably an African plant evolutionally, its purgative importance was very detailedly understood and utilised first in the early Ayurvedic Classics. Among these four, the invaluable medicinal significance of both castor and lime is well appreciated and utilised by Modern Medicine. Whereas the other two viz. bael

and wood apple still remain unfortunately confined mainly to Ayurvedic system of medication and to some extent in the Yunani system.

It has been well emphasised that a principal cause of disease is the upset in the digestive system. The four plants selected here take care of the activities of this system efficiently at its several facets. Bael and wood apple are appetisers and promoters of digestive ability. Lime is highly digestive besides being a mine of Vitamin-C and there is nothing like castor to safe, dependable and effective purgation.

Bael, wood apple and lemons all of them come under the family Rutaceae. The famous plant of orange also belongs to the same family. The members of this group are mostly trees, often big sized, or, shrubs, often thorny, and, rarely herbs like *Ruta graveolens* or *sadab*, a well known medicinal plant specially used for cold and running nose in children. A distinguishing feature of this family is the nature of the leaf. This may be simple or compound but in all cases if you hold the leaf blade against sunlight, you can find numerous small white spots representing the oil glands scattered all over; the lamina is described as punctate with these glands. When the leaves are crushed they give the characteristic aromatic smell, the citric acid smell of the lemon. Flowers are hermaphrodite viz. both the male and the female structures are found in the same plant. Both the sepals and the petals are free and are

usually overlapping one another. Flowers are all fragrant and arranged in clusters; petals are mostly white or greenish white, sometimes purple, but always mild coloured. The fruit is again a very characteristic structure, called the *hesperidium*; this however occurs only in lemon among the three plants we have chosen.

The general pharmacological actions of the family are as follows. The members are regulative of contraction and expansion, stimulating, easily and extensively spreading in the body and destructive of *vata doshas* and promotive of sweat formation.

A. BAEL-BILWA, AEGLE MARMELOS CORR

This is one of the more famous medicinal plants of Ayurveda. Of the many names of this plant, one is rather interesting; it is called a *shailusha*, an actor referring to the many forms that the plant takes up like an expert actor in its several medicinal uses. But the plant is more well known because of its leaves, the *bilva patra*, which is the prescribed article of worship for Lord Shiva. For this purpose, young and tender leaves with their characteristic three leaflets on a stalk are specially hand picked so as not to include any that is either broken or injured. It is one of the sacred trees of India, which are never injured and are grown in most temples specially of Shiva and house gardens. Its fruits are also sacred and considered to be an emblem of riches or fertility. A comparison with another

sacred plant of India is noteworthy. According to a well known *shloka*, *tulasi* ushers in auspiciousness; while, *bilwa* confers the very *moksha* or liberation. The reference to *vilva* occurs in Vedic Texts even; so ancient is its use.

Name

Sanskrit gives quite a few significant names. They are *shriphala* (bearing auspicious fruits), *shandilya* (holy; Shandilya was a holy and much respected Brahmin, in whose name there occurs a whole clan or a family or a *gothra* called *shandilya gotra*), *shylusha* (the actor), *malura* (ushering in *ma* or Lakshmi), *shalatu* (which particularly refers to a broken piece of fruit), *hridaya gandha* (with a fragrance that is endearing to the heart), *shreyahva*, *kangata* and *putimaruta*.

In English, this is sometimes called the Bengal Quince.

Botanical Aspects

The bael tree grows to a height of 15 to 25 feet - a rather medium sized tree. Its branches have many knots all along and they grow rather crookedly from the main stock and bear straight and strong thorns. Most usually the branches are full of insects. The trunk has a bluish hue. The leaves are alternate on either side of the stem and they have three leaflets, the two laterals being equal size and the middle one, a little bigger. Lamina or the leaf blade has numerous

translucent pellucid glands all over and filled with fragrant, volatile oil; as a result, the leaves themselves are fragrant. The leaves are shed down in the winter, the fresh leaves sprouting forth in abundance during spring and summer, the months of *chaitra* and *vaishakha*. In the early rainy season the greenish white flowers burst out; they are greenish white, and are also attractively fragrant. It is pulpy within and filled with many seeds which have a gum. Fruit is hard, greenish and egg like. They are 2-5 inches in diameter. Pulp is sweet, thick and orange coloured. From fruits pickles and *murabba* or syrupy preserves in sugar are prepared.

The tree is found all over India, from Sub Himalayan forests in the North down to the ends of the Western Ghats as well as in an isolated way almost everywhere excepting probably the Thar desert. It occurs wild in the jungles or is cultivated. Two kinds of fruits are available in the bazars: one is the small and the wild variety and the other, the large and the cultivated variety. The fruit which is most preferred for medicinal purposes is the full grown fruit of either variety, when it is just begun to ripe but not yet fully ripe. There again, it is the fruit of the jungle tree rather than the cultivated one that is more preferred medicinally; this is called bael *giri* - the pulp of the *bilva* fruit.

The tree is believed be indigenous (i.e. native) to India itself.

Medicinal and Other Importance

Ayurveda specifies its properties as follows: its taste is astringent and bitter; quality, light and dry; virility, hot and post-assimilative effect, bitter. It has the effects of removing swellings, piles and pain. It is employed in curing sprue (chronic malabsorption in the intestine), defective digestion, dysentery and diarrhoea.

Ripe fruit is sweet, aromatic, cooling and alterative (causing desirable changes in vital functions). Fresh fruit is useful in habitual constipation, chronic dysentery and dyspepsia (indigestion). Unripe fruit is astringent, good for stomach, cooling and soothing. The pulp is stimulant, reduces fever and antiscorbotic. Fresh juice tastes bitter and pungent. Root and stem bark also reduce fever.

Aegelin is its alkaloid and this has been extracted and tried in treating bronchial spasm viz. waves of involuntary contraction. An estimate of the popular acclaim of *bilva* as our ancient physicians had stressed can be had from the following prescription they advise for all digestive health. A drink of water in which *bilva* leaves are kept soaked overnight, seasoned and sweetened if needed is the best morning drink. The holy water of *tirtha* of Shiva's temples is this water kept in copper vessel. Along with this, a regular consumption of *bilvadi lehya* every day is a delicious, medicative and digestive food that would

act as a preventive of all digestive upsets and disorders.

In the Ayurvedic medicine, different parts of the tree are used for very varied purposes; that is why also it is a *shylusha*, an actor drug. The root bark is employed in the form of a decoction as a remedy for hypochondria (a nervous malady often arising from indigestion and tormenting the patient with imaginary fears; morbid anxiety about health) and melancholia (a state of insanity characterised by obsessive dejection and misery). It is also beneficial in intermittent fever and palpitation of the heart. The root is infact so famous that it forms one of the Ten famous root drugs - the *Dashamulas*. The leaves are made into a poultice and applied in that form for curing inflammations. The fresh juice from the leaves is bitter and simultaneously pungent in taste; this is diluted with water and then forms one of the very praise worthy medicines for catarrh, running nose and feverishness. The fruit when green as well as when ripe is used in cases of diarrhoea and intestinal disorders. It is the cut slices of the roasted or sundried fruit pulps (*bael giri*) that are used in diarrhoea and dysentery. The rind of the ripe fruit is astringent in taste and activity; this is employed in dyeing and tanning industries and also medicinally.

The parts of the plant that are used variously are: fruit (ripe as well as unripe), dried fruit pulp (*bael giri*), root bark, leaves, rind of the ripe fruit and also flowers. The plant is popularly believed to have many and remarkable medicinal properties.

It is not at all an exaggeration to say that no drug has been longer and better known nor more appreciated by people all over India than this holy tree of *bilva vriksha*.

Constituents

The fruit pulp or *bael giri* contains a host of useful substances: mucilage (a sticky, slimy substance useful in healing); pectin and sugar; tannin (tannic acid, helpful in tanning the leathers); volatile oil - responsible for the smell; a bitter principle, which makes it very useful medicinally; two per cent ash; and, a balsamic principle i.e. a liquid resinous and oily substance acting as a healing material. The balsams are oleoresins that contain benzoic or cinnamic acid and so are highly aromatic. One of the most famous balsams is the balsam of Peru, a dark, reddish brown, thick, syrupy, viscous liquid which gets developed when the true *Myroxylon pereirae* - of Central America is wounded. This falls off or is removed and constitutes the Balsam of Peru most praised for healing slow wounds and skin diseases. During the second World War this was used in field dressing stations for quick application of a protective covering on the surface of wounds. The balsamic principle of the *bael giri* very much resembles this balsam and can very well be used similarly.

The wood ash is also rich in a variety of materials, specially, the mineral salts such as potassium and sodium compounds, phosphates of

lime and iron, calcium carbonate, magnesium carbonate, silicate, sand etc. On distillation, the fresh leaves yield a yellowish green oil with a peculiar aromatic odour; this is called marmelosin. The dry pulp of the fruit is rich in mucilage and pectin. The pulp, specially in its seeds, is rich in gums.

The *bael giri* contains an odorous volatile principle-probably the essential oil and a nonvolatile body of the nature of an alkaloid called vasicine. This alkaloid is found in the leaves to the extent of 0.25 per cent. It is easily soluble in alcohol, slightly soluble in cold water and more so in hot water. Vasicine hydrochloride occurs in light, cream coloured crystals. An essential oil is obtained by steam distillation of the leaves, flowers and roots; this is golden yellow and has a fragrant smell.

Medicinal Uses

General properties and the action of the parts used.

Ayurveda considers the taste of *bilva* fruit as sweet and astringent; virility as cold and post assimilative effect as sweet and bitter. It is useful in destroying the aggravations of the two *doshas* viz. those of *pitta* and *kapha*. It is appetising, stimulative of digestive ability, dry in quality and useful in controlling dysentery due to *vata* and fever.

The raw unripe fruit is unctuous (oily), heavy, appetising, stimulative to digestive fire, but obstructive of stools and digestive. It is useful in pains, torpor due to indigestion (*amavata*) and sprue or chronic disorder of the bowels (*samgrahani*).

The ripe fruit creates heat in the body and is difficult for digestion and causes feebleness of digestion. The root of bael is sweet and destructive of the aggravation of all three *doshas*. It destroys pains and is light for digestion and beneficial in difficult urination, *kapha*, *vata* and *pitta* aggravations. It is an ingredient of the famous decoction of the Ten Roots.

The leaves of bael destroy *kapha* and *vata* aggravations, as well as pains in general and the unassimilated food (*am*). They are made into a poultice and applied over inflamed parts. The flowers of bael destroy dysentery, thirst and vomiting tendencies. The oil of the seeds of bael is hot and destructive of *vata* aggravations. The dried pulp of the fruit destroys the aggravation of all the three *doshas*. It is important to note that in most cases, it is the ripe fruit of a plant that is most useful. In bael however it is the unripe fruit that is always preferred. The ripe fruit is associated with many deleterious effects.

The wood of bael is considered as sacred as sandal wood. This is also an ingredient of the decoction of the Ten Roots (*dashamul*). The unripe or the half ripe fruit is considered to be an

astrigent (causing contraction among the living tissues and hence healing), digestive and stomachic (good for stomach). This is regarded as an excellent remedy for diarrhoea because of the presence of tannins and mucillaginous substances in it. It is sometime used in combination with opium. As noted already the fruit is also sliced and a sugary conserve is made from it for use in the treatment of diarrhoeas and dysenteries.

The ripe fruit is sweet, aromatic and cooling. When this is taken fresh, it exercises a laxative effect. The dried pulp is pale orange or flesh coloured and when stirred and mixed with water, this yields a pleasant orange coloured *sherbet* which has mild astringent properties.

Bael and Dysentery

It has been a long standing and a traditional belief that bael is an invaluable remedy in obstinate cases of chronic diarrhoea and dysentery specially where there is no accompaniment of fever. This is given either in the form of a powder or in the form of a confection or a sweetmeat. The use of bael in this regard was so widely prevalent that it was also well employed by the Western practitioners in India in the olden days and as such it got an entry into the British Pharmacopea or the Official List of Recognised Medicines in Britain. Bael was used for this purpose in three ways: (i) extract of bael taken from fresh unripe fruits and given in half to one drachm dosage several times a day. (ii) Liquid extract of *bael giri*

prepared from dried slices of unripe fruit and given in a dosage of one to two drachms. (iii) Powdered dried pulp kept in air tight bottle (thus preventing its exposure to moisture which will spoil it) and given in a dosage of half to one drachm.

However the use of bael in cases of amoebic entry is not much supported by any recent literature. It also does not seem to have any commendable effect in acute dysentery, specially so, when there is definite tenesmus (i.e. painful and ineffectual straining to relieve the bowels) and the discharge of blood and mucus though the powdered bael is specially recommended for this condition. Nonetheless, the beneficial effects of the bael fruit is most evident and undoubtedly so, when the condition has become sub acute or chronic. In these conditions its administration leads to clear signs of improvement: the blood gradually disappears from the discharge and the stools will also assume a more flocculent and solid form. If the use of bael is continued for sometime, the mucus also gets diminished and may in fact disappear altogether. There is no doubt whatsoever, as regards the usefulness of bael for patients suffering from chronic dysenteric conditions that are characterised by alternate diarrhoea and constipation. Bael is also reputed to be useful in relieving flatulent colic - i.e. twisting pains in the stomach accompanied with a bloating of the abdomen due to gas collection or in patients suffering from a state of chronic gastro-intestinal catarrh or discharge. In the after treatment stages

of bacillary dysentery (caused by a bacterium and not an amoeba as above) bael is an useful supportive addition. The principle difficulty of these patients is that they always have constipation and if this not relieved, the ulcerated surfaces will not be allowed to get healed firmly. It is precisely here that the bael *sherbet* is a very useful addition to the diet of the patient; this acts chiefly as a demulcent, i.e. cooling and soothing. The pulp of the fresh juice is mixed with sugar and cream or with curds or made into a *sherbet* by straining through a piece of muslin cloth so as to remove the seeds and the mucilage. In cases of sprue, a chronic debility of the bowels (*sangrahanā*) also, the bael fruit has been highly praised. For many patients of this condition, specially in the pre sprue or the early stages of the disease, bael fruit has proved to be undoubtedly beneficial. The fresh fruit is best taken raw mixed with sugar though dried fruit has also been recommended for this purpose.

Makaradhwaja made from pure mercury and gold leaf is a well known inorganic drug of Ayurveda. It is a renowned medicine from the days of Bhavamishra of the 16th Century and is still highly esteemed. But this is rarely used alone. In most cases it is mixed with various other drugs called *anupana* or adjuvants. In cases of indigestion and diarrhoea, bael fruit is the *anupana* for this drug. Bael or *Aegle marmelos* is undoubtedly one of the important antidysenteric plants of India. Some attribute an antitubercular effect also to this plant.

Bael and Diabetes; Also Prameha

The leaves of bael have been found to be very beneficial in diabetes. The patient should be given one *tola* of the freshly extracted juice of the tender bael leaves and this should be practiced for quite a few days continuously. Just a few days after the commencement of this treatment the sugar level in the urine - an important index of diabetes, gets reduced and this will totally stop after some time. The patient can be confidently advised to test the specific gravity and the sugar level in his urine on the day he starts drinking the *bilva* juice and then again after a month. He is sure to find an improvement. Till the sugar level completely stops he should be regularly taking this juice of *bilva* leaf. It has been that in a case of extreme diabetes, the patient did find noticeable relief by drinking the juice of *bilva* leaf in this manner twice a day, once in the morning and the other, at dusk, for a duration of two months.

Diabetes is a very devastating disease affecting a large percentage of our population. The familiar *bilva* leaf sacred for Shiva, would prove a boon for them.

There is another urinary affliction in which semen accompanies along with urine discharge, the *prameha* and the terrible venereal disease of gonorrhoea. For the patients of these diseases the oil from the seeds of bael has proved much beneficial. This is how to extract the oil: take half ripe fruits of bael, place them in an adequate

quantity of water and boil. When the seeds get separated from the pulp this way, remove them out, reduce them to a nice powder and treat this powder seven times (this is known as a *bhavana* process) in the decoction of *triphala* (*harda*, *baheda* and *amalaka*). The powder is then to be placed in the water again and the oil needed is to be extracted from the powder now.

The body is to be first cleaned and made ready by requisite vomiting and laxative procedure. Eight *rattis* of this oil is then only to be drunk on the first day, in milk. From then on, increase the dosage of the oil eight *rattis* every time; the dosage on the tenth day will be ten *mashas*. The patient should sustain himself during this regimen on milk and rice only. By this procedure the obnoxious diseases of *prameha* and gonorrhoea can be overcome. The body will become meanwhile strong and the eyes lustrous.

Bael and Vata: Also Nervous System in General

We have seen above that bael is used in such unusual diseases of mind as hypochondria and melancholia. It is the decoction of the root, root bark and sometimes stem bark that is used here. This decoction is also useful in intermittent fever and palpitation of the heart. Sushruta, the great surgeon includes an interesting mention for *bilva*. He does so under the section *medhayushkamiya* - meant for the augmentation and intelligence and long span of life and advises the consuming daily of the decoction of the bael root or the powdered

bark along with honey, milk or ghee and gold leaf. This however is to be done only after taking bath, carrying out the daily rituals and chanting the Shri Sukta (in praise of Lakshmi, the Goddess of prosperity).

The root of bael is pacificatory to nervous system. It is therefore much employed beneficially in *vata* diseases. Some of the effects that the roots bring about are: a pacification in increased heart-beat, insomnia or sleeplessness and insanity. Its use is however accompanied with an amount of intoxication.

Other Uses

In cough, take two drachms of the leaves with honey or with one drachm of ginger juice or a decoction of the leaves and root with pepper in a dosage of half to one ounce. This is an excellent cough mixture useful in chronic bronchitis (inflammation of the branches of the wind pipe), asthma and pthisis or consumption. In consumption specially, it is very useful in relieving the uncontrollable and the highly distressing cough because of its soothing action on the nerves. It also liquidises the hardened sputum in addition, which can then be easily expectorated or coughed out.

Both the decoction and the powders are ingredients of many Ayurvedic preparations for the affliction of the respiratory tract. Dried leaves are smoked as cigarettes with great benefits by the patients of asthma.

Bael Sherbet and Bael as a Dietary Article

A pleasant orange coloured morning *sherbet* is prepared by mixing dried pulp of the fresh ripe fruit with sugar and cream or with curds. For this purpose, two ounces of the pulp are mixed with three or four ounces of water or syrup and this is followed by a straining of all these through a piece of muslin cloth to as to remove the seeds and mucilage. Bael water prepared in the following way is a specific medication for dysenteric diarrhoea. An unripe fruit is taken; this contains much starch which is at the point of being converted to sugar on ripening. This is then cracked into two or three places and roasted; the inside of the fruit will thus become softened by the heat and the starch is further converted to sugar. This is finally mixed with hot water to which a pinch of fried and powdered *badesaunf* or anise (*Foeniculum vulgare*) is added. The whole mixture is strained; this would then have both the starch water containing bael sugar (the active antidysenteric principle of bael) and the carminative (gas expelling) property of the anise. This is also taken as food when cold, three or four times a day. No other food is given when this treatment is being continued. Extract of bael from fresh unripe fruit is also given alternatively in a dosage of half to one drachm dose, several times a day. Liquid extracted from dried slices of unripe fruit is also prescribed in a dosage of one to two drachms.

The *sherbet* has mild astringent properties; it is also a mild laxative and is a good, simple cure for

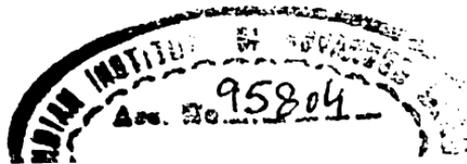
dyspepsia or indigestion. Bael fruit is eaten as a diet during convalescence after diarrhoea. The pulp of the unripe fruit and arrow root (*tabashir*) form a good diet for patients of dysentery. A bael marmalade or an aromatic confection is useful at the breakfast in the morning during convalescence from chronic dysentery or diarrhoea. It also acts as a prophylactic or a preventive agent during an epidemic of cholera. In addition, eating this regularly prevents the growth of piles.

A few different formulations of bael: Fresh juice of the leaves is given, added with black pepper in anasarca - a diffused dropsy or morbid collection of water and swelling, of the skin and the subcutaneous tissues, just beneath the skin. When diluted with water or honey this forms a highly praised medicine in running nose-catarrh and feverishness. This is largely used in Bengal as antibilious i.e. against *pitta* and as a febrifuge i.e. to remove fever. Leaf juice is applied in painful eyes. A leaf poultice is applied over the head in the delirium of fever. The astringent rind of the ripe fruit is employed by the kaviraj's of Bengal in acute dysentery. Its usefulness is heightened when combined with opium. Powder of the dried pulp stored in air tight bottles is given in doses of half to one drachm with treacle or molasses in recent dysentery accompanied with griping pain in the loins and constipation. This is used in different doses for diverse results. As a tonic, the dose is from 12 - 15 grains of the powdered pulp; as a febrifuge and an antiscorbutic. it is from 16 to 20

grains and as a nauseant and an antidysenteric, it is from 20 grains to 2 drachms. The powder is more useful in acute diseases and the syrup in the chronic cases. This is an excellent preparation for children in chronic diarrhoea: powder of unripe fruit - six grains, is to be mixed with a combine of kino powder (*vijayasar* in Hindi or *Pterocarpus marsupium*) and pure white sugar - one grain. This dose is to be given two or three times a day. Pulp of the fruit when mixed with milk and given with cubeb powder (*kababchini* or *Piper cubeba*) acts as a diuretic-inducing profuse urination. It is also an astringent-a healer, in the mucous membranes of the generative organs and is therefore beneficial in the painful sexual disease of gonorrhoea. The small unripe fruits are given with fennel seeds and ginger—all forming a decoction, in the affliction of piles. This is the practice in Konkan areas. Two *tolas* of the juice of the bael bark is given with a little cumin in milk as a remedy for scantiness in semen.

The pulp of the unripe bael fruit is to be kept soaked in an oil for a week. Before taking bath, this oil is to be applied all over the body, a massage is to be done and then only one should take the bath. This will set right the burning sensations, specially at the tendons of the hands and the feet. This was a common practice in India in the recent past.

Yunani opinion: Bael is an important drug in the Yunani system also. This is considered as first



degree hot and second degree cold. Hakims call it as *safarjale hindi*, *bal* or *bel*. They also extol its efficacy in dysentery and diarrhoea. An important stress they make is as regards its use as a preventive of haemorrhage along with its astringency. It is because of this reason it is useful in all cases of haemorrhage, dysentery accompanied with blood and excessive menstrual flow.

References on bilva in our Ayurvedic Classics:
 Since the plant is one of the very famous medicinal plants of India, its specific reference occurs in most classics of Ayurveda. An idea of this can be had by the following selected list of some of the famous authors.

Charaka: He opines 'that seating a patient of piles in a tub bath of comfortably hot decoction of *bilva* root will be highly mitigative of the distress. Prepare a paste or *kalka* from the pulp of a young, unripe bael fruit in an equal quantity of any bland oil. This is to be taken in cream, curds, ghee or oil. This will rectify diarrhoea and dysentery.

Sushruta: He advises that it is useful to make a garland of the thorns of *bilva* and place it on the neck of a child suffering from a nervous disease called *skandha graha* (seizure by *skandha*).

Unripe fruit is to be taken, its pulp is to be removed, dried and powdered. This is to be mixed with liquorice root (*mulethi* in Hindi), honey and sugar candy and then drunk in rice water. This is

a cure for dysentery due to *pitta* and dysentery in which haemorrhage also occurs.

Chakra datta: For a foul smell on the body, apply the juice of bael leaf all over the body. This will remove the foul smell due to sweating. In dysentery, take the powder of the pulp of the unripe fruit and dry ginger - both in equal quantity. This is to be drunk in butter milk. Avoid meals altogether and take only the butter milk. The violent dysentery will come under control then.

In vomiting, take a decoction of the *bilva* root mixed with honey. This will overcome vomiting tendencies due to all the three *doshas* of *pitta*, *kapha* and *vata*. In bleeding piles, taking the pulp of *bilva* and butter milk proves beneficial. In oedema, bael leaf juice is to be given with black pepper. This will remove oedemas due to all the three *doshas* and also jaundice and specially the constipation that is common in piles. In deafness, crush a bael fruit in cow's urine, warm it in an oil and use this oil now as an ear drop. This is reputed to cure deafness.

Bhava mishra: The powder of unripe bael fruit is mixed with jaggery and given in *amashula* or stomach ache in dysentery or colic (i.e. twisting) pain arising from indigestion.

Vangasena: For vomiting tendencies and dysentery in children, mix sugar candy and parched rice (*laja*) in a decoction of the bael root, to effect a sure cure.

Vaidya manorama: In malarial fever, prepare a fresh extracted juice of *bandaka*, a tree parasite, which is growing on a bael fruit tree and give this with butter milk or ghee. This proves effective.

Bael as a Household Remedy: Since *bilva* tree is very common and the fruits are also procurable with not much difficulty there exist a number of recipes for using it as a routine household remedy for some common ailments. The following are a few well known recipes of this type.

1. Take bael fruit, one part, *Holarrhena antidysenterica* or *kutaja* bark, two, sweet fennel seeds (*saunf*, *Foeniculum vulgare*), and *harda* (*Terminalia chebela*) one each; and sugar, three parts. Mix, powder all of them together. Add *isphagula* or *plantago* seeds. The dose is one to three drachms. This is useful in subacute and chronic dysentery.

2. Take the dried pulp of the bael fruit, four parts; *Scindaspus officinalis* or *gaja pippali*, *Andropogon muricatus* or *khus khus* grass and *lodhra* or *Symplocas officinalis* all, one part each. Mix and powder. The dose advised is 20 to 30 grains. This is useful in chronic diarrhoea and dysentery.

3. Take the dried pulp of the fruit, 2-1/2 drachms, dried ginger 1-1/2 a drachm, *saunf* 2-1/2 drachms, the gum of the Silk Cotton tree, 1 drachm, honey 1 drachm and sugar 3 drachms. Mix and powder to a fine degree. The dose advised

is 1/2 to 1 drachm. This is used in chronic dysentery and dysenteric cholera, of the hot climatic regions.

4. Take bael fruit pulp 1 drachm, and an equal quantity of pomegranate bark. Mix and powder. The advised dose is 1/2 to 1 drachm. This is employed in dysentery and chronic diarrhoea.

5. Take the rind of the fruit 5 parts and *guduchi* (*Cocculus cordifolius*) 4 parts, mix and prepare a decoction. Add honey and administer to check vomiting.

6. Take *bilva rasayanam* 1 ounce and an equal quantity of castor oil emulsion. Mix and administer in a dosage of one ounce every three hours. This cures dysentery within three days. The diet prescribed during this period is thin butter milk and the fruit juice of Kamala oranges.

Modern Work

The active principle here is aegelin, a neutral alkaloid. Its production in the plant shows a distinct seasonal variation. Its yield is negligible during December to February and maximum (0.2 per cent) during June to August. Two more characteristic active substances were also extracted. They are aegelenine, a minor alkaloid from the leaves of bael and marmin, a new coumarin drug isolated from the trunk bark of bael.

Extracts from the leaves taken in water and alcohol was tried on the heart of the frog. This was seen to cause an increase in the amplitude and force of contraction very much like what a well known drug digoxin brings about. The alcoholic extract from the roots and fruits of bael when tried on albino rats showed a hypoglycaemic activity viz. that of reducing sugar level in the blood - an important asset in treating diabetic patients. The fruit extract was seen to be antiviral in the Ranikhet disease. Marmelosin, another substance isolated from bael showed anthelmintic (i.e. worm killing) activity against ankylostomiasis or hookworm.

B. WOOD APPLE - KAPITTHA, FERRONEA ELEPHANTUM CORREA

In popular parlance, bael and wood apple go together and are often confused. In fact the term *bael* in some regional languages (eg. Kannada) refers to wood apple. That is why, after *bael*, it becomes necessary that we should consider wood apple. Besides, the two fruits have many common uses and actions. Kannada makes it more confusing, for, it calls the fruit of wood apple as *belada phala* or even *bilva phala*. Konkani, an allied language names it *belpatri phala*. The fruits of both the plants constitute famous medicinal drugs. And, both are used so since very remote times. Atharva Veda for instance, includes a praise of the *kapittha* roots, which is also extolled as a promoter of virility and strengthening in general.

Kapittha is one of the favourite fruits to be offered to God Ganesha. There is a popular belief that the fruits of this tree is much liked by elephants who have an interesting habit of eating them. They eat them whole, take in only the sweet pulp but discard intact the shell of the fruit as such! The specific part of the technical name viz. *elephantum* is an allusion to this belief. On the same reason, English calls it as an Elephant fruit. The name wood apple signifies the woody nature of the fruit wall within which the soft, wholly edible pulp, the apple, occurs. Wood apple is one of the important minor fruit crops of India much relished for its cooling sweet pulp of the fruit which can be eaten as such or more commonly made into delectable and refreshing *sherbet* much welcome during the summer.

Names

Sanskrit calls it as *kapittha*, *kapiipriya* (as the tree abounds in monkey who relish its fruits much); *dadhittha*, *dadhiphala* (a curds like fruit referring to the curds like consistency of the fruit pulp), *danta shata* (souring the teeth).

This is called in Hindi as *kavat*, *kavitha*, *kaitih*; in Gujarati, *kotha*, *kavit*; in Bengali, *kathbel*; in Kannada, *belada phala*, *bilva phala* or *belawalakayi*; in Arabic and Persian, *kabita*; in Marathi, *kavath*; *Velaga* in Telugu; *vilak pittam vilapalam*, *vellil* in Tamil; *vilav* in Malayalam; *katori*, *kavath* in Sindhi.

Botanical Description

This is a moderate sized tree armed with straight strong and sharp spines that are 1/2 to 1-1/2 inches long. Leaves smell like aniseed (*Pimpinella anisum* or *saunf* in Hindi). They are alternate on either side of the stem and imparipinnate viz they have a number of leaflets on either side of the central axis along with one more leaflet at the tip of the axis. Both the stalk of the leaf and the central axis are flat and often winged narrowly. Leaflets are 3-9 in number and are found opposite each other on the axis. They are usually obovate in shape, tip is often curled. Flowers are small, numerous, dull red in colour and are arranged in lateral or terminal hairy panicles or much branched structures. Male and female flowers are often found in the same panicle. Fruit is 2 to 2-1/2 inches in diameter, globose or spherical. The fruit wall is woody, rough and grey coloured. Seeds are many, mucillaginous and embeded in the pulp which occupies the whole of the fruit cavity. The tree is often cultivated all over India but nowhere on a large scale. It also occurs quite commonly in the forests. The plant is found also in Sri Lanka and Indonesia commonly.

Medicinal and Other Importance

Fruit, gum, leaves, bark and the fruit pulp are the parts that are used variously.

The pulp contains many valuable substances: citric acid, mucilage and ash containing potash.

lime and iron-all, in large quantities. Leaves yield an essential, aromatic oil, similar to the one from the leaves of bael or *Aegle marmelos*.

The general actions as a medicinal drug are: the fruit is aromatic, acidic, anti-scorbutic (counteracting scurvy), astringent (and therefore healing-the unripe fruit) and refrigerant (cooling and refreshing). Gum from the stem is soothing and cooling. Leaves are aromatic, carminative (i.e. gas expelling) and astringent.

Pulp of the ripe fruit tastes like coagulated milk (hence, it is named *dadittha*, and *dadhiphala*). It is eaten, mixed with sugar or more commonly with jaggery. Apart from being delectable, this is useful in excessive salivation, sore throat and other affections of the gums and the throat. A *sherbat* from this is a very refreshing drink for the summer days. A tasty *chutney* is also made with this by an addition of salt, tamarind and spiced with dry ginger, black pepper and cumin seeds. In both form, it also serves to cure hiccup, billiousness and throat affections. Tasty chutneys are made from the unripe fruits also. In cases of hiccup and dyspnea (difficulties in breathing), their pulp is given with honey and *pippali*. Another tasty and medicative preparation made from the pulp is a jelly which tastes like black currant jelly but is more astringent. The pulp is also used externally as an application in the bites of insects and snakes. For this purpose however the woody rind is also powdered and used. Unripe fruit is used

alone or with the pulp of *bilva* fruit and others as a medicine in diarrhoea and dysentery. A syrup of the fruit is prepared and given in a dose of 1/4 to 1/2 ounce with much benefit in rectifying dyspepsia (indigestion), to quench the thirst in the patients of fevers and also in scurvy. The gum exuded from the stem when cut or broken is transparent. It is soluble in water and looks very much like the famous *kikar* or gum arabic and is equally costly but more sticky. After the rains, gum exudation from the tree is profuse. This is very useful in bowel affections and more particularly to relieve tenesmus or the painful and ineffectual straining to relieve the bowels. The dried gum is powdered, mixed with honey and given beneficially in diarrhoea and dysentery. In fact, the wood apple fruit forms a valuable diet for patients convalescing from an attack of diarrhoea. A type of writing ink is prepared from this gum in Java. Many firm dyes are also prepared from the gum.

The fragrant young leaves smelling like *saunf* and also their fresh juice mixed with milk or curds and sugar candy is given beneficially in biliousness. The juice is also applied externally to cure the eruptions caused by biliousness. Leaf is carminative in addition. The young tender leaves are digestive and destroy urinary stones and flatulence. They are given in indigestion, diarrhoea and dysentery. The bark of the stem is a prescribed drug for biliousness; it is given either in the form of a powder or a decoction. A specific recipe called *pancha kaphittha* exists consisting of the five parts

of the plant (roots, leaves, bark, flowers and fruit) for the same purpose. A medicated oil is also prepared similarly with all of these materials for an external application. A famous compound powder or *yoga*, called *kapitthashtaka churna* based on wood apple is recommended by Sharangadhara, a classical ayurvedist for chronic diarrhoea and dysentery accompanied with loss of appetite and also in throat affections. This is given in doses of 1 drachm and given in milk and sugar or with honey. Its preparation is as follows: Take 8 parts of the pulp of the unripe fruit, 6 parts of sugar, 3 parts each of pomegranate juice, tamarind fruit pulp, bael fruit pulp, flowers of *Woodfordia floribunda* (*dhataki*; or *dhatua* in Hindi), *Apium graveolens* (*ajamoda*) and long pepper and one part each of another long list viz. black pepper, cumin seeds, coriander, long-pepper root, root of *Pavonia odorata* (*bala* in Hindi), sonchal salt, *ajawan*, cardamoms, cinnamon, *tejpat*, flowers of *Messua ferrua* (*nagakeshar*), ginger and *Plumbago* (*chitrak*) root. Powder all of them and mix.

Constituents

A chemical analysis of the fruit pulp shows its invaluable components. These occur in the following percentages: water 69.5, nitrogenous substance 7.3, mineral matter 1.9, fibres 5.2, carbohydrates 15.5, calcium 0.13, phosphorus 0.11. Iron content is 0.6 milligram, riboflavin 170 milligram and vitamin C 2.0 milligram in 100 gram of the material. The amounts of calcium and

phosphorus are also commendable. Besides these, the pulp shows 3 to 5 per cent of pectin which is useful in converting the pulp into a jelly. Wood apple jelly is excellent in colour as well as taste. The pulp of this fruit is useful in dysentery and sprue (intestinal malabsorption) very much like the pulp of *bilva*.

Some Specific Ayurvedic Remedies

Ayurveda designates the properties of wood apple as follows: the taste is sweet, acidic and astringent; virility is cold; post assimilation effect is sweet, acidic and bitter. It counteracts the aggravations of two *doshas*, *vata* and *pitta*.

Since the plant is one of the famous drugs of Ayurveda, it will be instructive to look at the references from a few reputed classical authors. This is as follows:

Charaka

1. *Piles*: a soup or broth is prepared from the pulp of the fruits of wood apple and *bilva* together. This is given to the patients of piles.

2. *Hiccup*: Drinking the juice of *amalaka* and wood apple pulp adding *pippali* and honey will stop hiccup. Using only *kapittha* this way is also equally effective.

3. *Cases of oral poisoning*: Much benefit can be secured by licking the pulp from the unripe fruit along with sugar candy.

4. *Cases of plethora or rakta pitta*: Prepare a paste of *rajadana* and the wood apple leaf. This is to be fried in ghee and eaten. This will cure all cases of plethora.

Sushruta

5. *Cases troubled with an application of poisonous colyrium (arjana)*: The disorders caused by such a colyrium applied over the eye should be treated with the juice of the flowers of *kapittha*.

6. *Repeated vomiting: Pippali* and honey are to be added to the leaf juice and repeatedly licked up.

7. *Freckles, black spots and disfigurements on the skin*: The juice of leaf and *rajadana* is to be applied externally.

Vagbhata

8. *Vomiting due to kapha*: Mix three pungents (*trikatu*) in the fruit pulp and eat.

9. *Ear disease due to kapha*: The leaf juice is to be dropped in the ear.

10. *Inflammation of the eye*: Mix equal quantity of honey with the leaf juice. Place this as eye drops.

11. *Urinary affliction due to kapha*: Powdered flowers of *kapittha* are mixed with honey and given.

12. *Anorexia or tastelessness*: A confectionary prepared from the pulp of the mature fruit is advised to be eaten mixed with *trikatu*, honey and sugar candy. Or, this may be kept in the mouth

like a lozenge and the juice continued to be sucked in.

Bhavamishra

13. *Diarrhoea*: Take the leaf of any one of these; *ghataki*, *badari* (*Zizyphus jujuba*) or *kapittha* and prepare a paste by grinding. This is to be drunk with curds.

Vangasena

14. *Pradara* or *leucorrhoea*: Take equal parts of the juice of the leaves of bamboo and *kapittha*. Or, if the leaves are dry, take their powders similarly. This is to be given mixed with honey.

Vaidyamanorama

15. *Hiccup*: Its violence will be much reduced if the leaves of *kapittha* are crushed with the hands and smelt.

Sharngadhara

16. *Ear ache*: Take the freshly extracted juice from the leaves of wood apple, warm it up and place in the aching ear.

Yunani physicians considers the pulp of the unripe fruits which is somewhat astringent and sour in taste and white in colour, as cold and dry in the third degree. The pulp of the ripe fruit is sweet and sour, tasty, fragrant and red; this is considered as second degree cold and dry. They presume that the ripe fruit is strengthening to the heart and creates a sense of well being and good

mental disposition (*saumanasya*). It gives strength to liver, stomach and intestines. It mitigates the violence of *pitta*, quenches thirst and pacifies the pain. It is therefore beneficial for persons of *pitta* constitution and the disease of *pitta*.

The properties and action of *kapittha* is much like those of *bilva*. But the efficiency in alleviating billiousness and the disorders of blood as found in the former is much greater. Leaves are particularly useful in cases of *vata* aggravation. The gum reduces the distress of painful stomach (*petchish* in Hindi). Seeds counteract artificial poisons viz. *gara*. They are also useful in *visarpa* (a spreading, red coloured eruption) at the cheeks.

Finally, here are a few household tips for using the wood apple: *Sherbet* of wood apple is a good quencher of thirst. For this purpose, it is better to use jaggery instead of sugar. This *sherbet* obliterates foul smell of the mouth, prevents haemorrhage and confers a power of disease resistance.

Eating the pulp of the fruit adding an equal quantity of sugar would remove phlegmatic complaints and quieten the aggravations of *pitta*. A regular consumption of wood apple is likely to improve chances of fertility among the persons who are prone to barrenness. Breasts that have become lax because of defective activity of milk glands would regain their normal state. Remove the seeds from the pulp, mash the pulp well and eat. This is good for dysentery, diarrhoea and piles.

C. LEMONS - THE CITRUS FRUITS

Lemons form an important citrus fruit. The other famous fruits of this genus *Citrus* are oranges (*C.aurantium* L) that has two varieties *nobilis* (Nagpuri) and *sinensis* (Satkudi or Musambi) and *C.decumana* L (Pomelo or Shaddock, *papnas* in Hindi). They all have the characteristic fruit hesperidium (described below). Citrus fruits were domesticated from wild ancestors in Eastern and Southern Asia in remote times. Some are under cultivation since 3000 years and are occasionally cultivated even for reasons other than eating. Citron (*bijaura* in Hindi) for example was planted in the famous Hanging Gardens of Babylon for use in cosmetic water and pomade (ointment for hair) and not for its edibility. These fruits were introduced early in the Mediterranean region where they have always been an important crop. There are nearly 100 species in the genus *Citrus* but only a few are of commercial value and well known.

The citrus plants are thorny aromatic shrubs or small trees. Their leathery, evergreen leaves are gland dotted. They look simple but are actually compound with a single leaflet with a joint between the leaf blade and the stalk. The white or the purplish flowers are solitary, produced in great profusion and often very fragrant. The citrus fruits are grown world wide. Though they are tropical plants, they form important commercial crops of the temperate regions as well. Oranges and pomelos are allowed to ripen on the tree while the lemons are plucked when almost ripe and then

ripened separately; if left on the tree, lemons are likely to be spoiled. The rind of all the citrus fruits yields a valuable essential oil. Though it is not much known, the dried waste pulp is an excellent cattle feed. Other important by-products are: citric acid, pectin (useful in jelly making) and various glucosides.

Lemon is a native of Southeastern Asia, grown there since ages but would have reached India very early. It has been grown in Europe since the days of the Greeks and the Romans. This is a small tree with short spines and large, white or purple and sweet scented flowers. Lemons contain 0.5 per cent of sugar and 5 per cent citric acid. The juice is used for lemonade (an aerated drink) and other beverages, as a flavouring material, a bleaching agent and a stain remover. The rind is the source of lemon oil forming an important industry and used in perfumery, soap making and lemon extract which is next to vanilla as a flavouring substance. The extract is made by dissolving 5 parts of the oil in 95 parts of strong alcohol.

We confine only to lemon which is botanically *Citrus medica*. This in turn has four varieties as mentioned below; all are of considerable popularity and great use as dessert fruits as well as in medicine.

Citrus Medica Linn

This is a shrub or a small sized tree, flowering almost the whole year. The young shoots are

smooth, non-hairy and often purple. Leaves are leathery, foliolate, the stalk is naked or winged. Leaflet is 6 to 8 inches long, elliptic ovate or ovate-lanceolate and usually obtuse. The margin is crenulate or thrown into many small curls or serrate, with teeth throughout but all pointed towards the apex. Flowers are white or pinkish with a sweet scent. They are borne in singles or sometimes clustered in small racemes. Sepals form a cup, which is having 3-5 parts. Petals are 4-8 in number, linear oblong in shape and thick. Stamens are many, 20-60 and their filaments are joined with one another in many ways; these are rather compressed at the base. The fruit is a berry of a special and characteristic type, unique to all citrus fruits, viz. the lemons, the oranges, the shaddoks or pummelos etc. Here the fruit wall is a thick glandular rind that encloses a number of compartments within. Each of these have a separate thin membrane that bears on its inside innumerable glandular hairs, that are the edible parts. In the centre are found a few number of rather large seeds that have a thick some white sticky coat, or the surface is mucillaginous. The whole fruit is globose or oblong and often have a knob like pointed tip viz. it is mamillate. It is usually yellow when ripe.

This is cultivated very widely all over India, specially, the warmer parts. There are many cultivated varieties, chiefly varying in the size and shape of the fruit. The three major varieties are as

follows. Every one of them however has many further variations under cultivation.

1. *Citrus medica proper*. This is the Citron (*maphal* in Hindi). The fruit is large here and oblong, obovoid or somewhat irregularly shaped. The rind is thick and characteristically thrown into irregular swellings or warts on the surface. This rind is very aromatic and encloses a scanty pulp which is less than sour and best relished with an admixture of sugar in which form it is usually taken.

2. Var. *limonum*. The lemon (*jambira* or *pahadi nimbu* in Hindi). The stalk of the leaf is winged. Fruit is ovoid, yellow and distinctly mamillate. The rind is thin and the pulp, abundant and very sour.

3. *Citrus medica*. (the medicinally valuable) L.var. *acida* (the sour). This is the sour lime (*limbu* in Hindi) of India. Here, the leaflets are elliptic-oblong. The flowers are small and so also is the raceme on which they are borne. Petals are usually 4. Fruit is mostly small, globose or ovoid. The rind is thick or thin. The pulp is pale and very sour. This is the common lemon and very widely cultivated all over India.

4. Var. *limetta*. The sweet lime of India (*mitha amrit phal*, *mitha limbu* in Hindi). Here, the fruit is globose, 3-5 inches in diameter. The rind is thin, smooth, and adhering to the pulp. The juice is abundant, sweet but not aromatic.

1. **Citrus Medica L. Citron**

Citron is the oldest of the citrus fruits and the first to be known by Europeans going back as far as the fourth century B.C. It probably originated in India and has been cultivated in South eastern Asia since ancient times. This was described from Babylon by Theophrastus, an early European herbalist. It is a small thorny tree with pretty purple and white flowers. The fruit is fragrant, greenish yellow in colour, oblong in shape and 6 to 9 inches long. The thick skin is tough and warty and the acid pulp is scanty. Commercial citron is the candied rind of this fruit- this is prepared by treating the fruit with brine to remove the bitter oil. The rind is then candied in a sugar and glucose solution. Citron is one of the best and the most expensive condiment. The essential oil of cedrat used in perfumery is expressed from the rind.

Names

Sanskrit gives a number of interesting names which have given rise to different adaptations by our regional languages. They are *bijapura* (full of seeds - from which *bijaura* of Hindi is derived) *matulunga* (the fruit like the mother's breasts-from which *madala* of Kannada and Tamil are derived), *madhulunga*; *sukesara* (with fine stamens); *phala pura* (wholly a fruit) *karuna*, *ruchaka* (tasty).

It is called *cholongnibu*, *tavanebu* in Bengali; *bijauru* in Gujarati; *mahalung* in Marathi, *bijaura*, *turanja* in Hindi; *madala hannu* in Kannada;

madalapalam in Tamil; *madalanarakam* in Malayalam; *madephalamu* in Telugu.

Its other names in English are Adam's apple, Melon lime, Cedrat.

Botany

This is a shrubby small sized plant looking much like the ordinary lemon in leaves, flowers and stamens etc. but the leaves are bigger and broader. Flowers are very many, white and fragrant. Fruit is long and pendulous, much like the breasts of the mother with a teat like tip as well. It is very large sized and weighty, ranging from 20 to 40 *tolas*; but the fruits of a single tree are very variable sizes; they are small as well as big. The rind is much warty, thick, soft, fragrant and acidic bitter in taste. On ripening, the fruit becomes yellow and beautifully coloured. There are two varieties based on the taste of the fruit, sweet and sour.

The tree forms a choice cultivation in gardens and orchards in many places in India. It is well cultivated in the Himalayan ranges even at the height of 4 to 8 thousand feet.

Medicinal and Other Importance

The parts of the plant used are: the candied as well as the raw fruit, fruit juice, stamens, seed, root and leaf.

All the constituents as are available in lemon are found here. The citric acid from the fruit is

available here in granular form; it is this that is used most. In the rind of the fruit occur a volatile fragrant oil which contains 76 per cent citrene, 7-8 per cent citrol and some amount of cymene and citronellal; all, valuable substances in their own ways.

This is one of the well discussed medicinal plant of Ayurveda. Specific qualitative differences have been recognised for its various parts. The ripe fruit is light for digestion, oily, good for heart and pacificatory to plethora (*rakta pitta*). The unripe fruit is sour, strong, excitatory to heart and dry in quality. Both are purificatory and employed beneficially in many afflictions such as: lack of taste, vomiting tendency, feeble digestive ability, indigestion, liver and spleen disorder, breathing difficulty, cough, thirst, pain and piles. The fruit ripening on the tree itself is more efficacious than the one that is plucked and ripened. The unripe fruit causes the aggravation of all the three *doshas*. Ripe fruit is sweet, slightly astringent, strengthening, nourishing and digestive. The rind of the fruit is difficult for digestion, predominantly bitter, unctuous, hot and destructive of worms and *vata*. The juice of the rind is oily, very cold, sweet, heavy. The citric acid extracted from the juice is an excellent digestive. For many digestive disorders, it is mixed with allopathic medicine and given. If you bite well a piece of the rind once even, the foul smell of the mouth will disappear and the flatus becomes clean. Its decoction is given for worm infestation. Adding its powder to gingely oil will

yield a stimulative oil. It is said that if a piece of the rind is kept in a bottle of wine, the latter will turn into vinegar. The rind is an excellent material for making sugary preserves or *murabba* with country sugar and honey. This is given in dysentery and diarrhoea.

Fruit is used to expel poison. Pulp is cold and dry, if sour; cold and moist, if sweet. Distilled water of the fruit is sedative. The candied citron rind is well liked and constitutes a good industry in States. It is also pickled with salt, sweet oil and chillies and the like. This is a good appetiser in various kinds of fever, indigestion and inflammation. Extract of cidrat is the oil of citron dissolved in spirits to which bergamot (fine pear) is added to make a costly and refreshing drink. The fruit kernel is usually eaten with sugar and often preserved also with sugar.

Flowers are stimulative, astringent, light and cold; they are destructive of plethora. Stamens are stimulative, promotive of intellect, light, astringent, taste conferring and beneficial in the affliction of spleen, stomach, breathing, cough, hiccup, constipation, and piles. The juice of the stamens is curative of pains at the ribs and bladder; and, also anorexia and cough. Root is stimulative, astringent, cold and a pacifier of pain. There also exists an injunction of seasonal variation in using the fruit juice and pulp to derive the best effect. In rainy season, they are to be taken with *saindhav* salt; in autumn, with sugar or sugar candy; in

hemanta, *sisira* and *vasanta*, sprinkled with an oil containing salt, ginger, *hing* and black pepper; and in summer, with jaggery.

We shall now see its use in some specific diseases.

1. *Burning Sensation and Vomiting Tendencies*

Take half *tola* of the fruit juice, mix it with sugar and honey and prepare a *sherbat* and drink. Ginger powder, black pepper and *pippali* can also be added. The aggravated *pitta* will get quietened and its abundant distresses will quickly disappear. Other recipes: Mix sugar with juice, cook and prepare a syrup, and drink adding a little water. Vomiting will stop if puffed rice (*laja*), sugar, *pippali* powder and honey are added to the juice and drunk. If vomiting is due to *vata*, it is beneficial if its confection or *avaleha* is licked. This is prepared by adding cardamom, powder of ginger (wet or dry), honey and country sugar (*khand*).

2. *Hiccup and Cough*

Add a pinch of black salt and honey to the juice and drink. Or, mix dry ginger, *amalaka*, *pippali* powder and honey. This is to be slowly sipped.

For cough, add to the juice the following: fried *hing*, *triphalā*, liquorice (*mulethi*) and sugar candy - all in equal proportions and finely powdered. This is to be mixed with ghee or honey and continued to be licked. This will take care of cough due to *pitta*.

3. Disorder of Spleen, Liver and Jaundice

Mix *hing*, pomegranate seeds, *vid* and *saindhav* salts in the juice, add 1/4 quantity of vinegar (*suramand*) and administer. This is beneficial to splenic enlargement.

In liver troubles, take 2 *tolas* of the fruit pulp and give it with 6 *mashas* of black salt. This is also curative of jaundice.

4. Epilepsy

Mix neem leaf juice with the juice of *bijaura* and also the leaf juice of *nirgundi* (*Vitex negundo*). The patient take this an an *errhine* (a nasal drug) to sniff for three days.

Or, add *saindhav* salt in its juice or sprinkle *saindhav* salt on a sugar preserve of the fruit piece and administer.

5. Fevers

For *sannipata* fever, add the three salts (*saindhav*, *vid* and *black*) in a warm juice of *bijaura* and wet ginger. This is to be sniffed; the phlegm becomes loosened then and expelled, and the symptoms of headache, the pains at the heart, throat and face, the distress at the sides and the like will disappear. The patient will get much relieved.

If during the fever, the patient feels dry at the palate and too much burning, mix with the juice equal amounts of honey and ghee, add a pinch of *saindhav* salt and apply over the head.

The root bark, *amalak*, *harad*, dry ginger and the *pipal* root are made into a decoction, *javakhar* is added to it and given on the 12th day of fever due to *kapha*.

6. Pains

The pains due to *vata* will disappear by taking upto one *tola* of powdered root bark mixed with ghee. The pains of the stomach, the heart and the bladder regions will be pacified by taking the juice of the fruit or the root mixed with honey and *javakhar*.

In cases of *makkal* pains (at the uterus after child birth), a severe headache often occurs. For this, take the root, the root of jasmine, the bark of bael and *nagarmotha*. Grind them and apply over the head as a paste.

7. For Cosmetic Purposes

Along with the root, add *kachur*, *rasna*, the three pungents, *harad*, *sajjikhari*, *javakhar* and the five salts (*saindhava*, *vid*, *sanchal*, *kali* salt and sea salt) - all in equal quantity and powder. This is to be taken in luke warm water. It will promote strength, luster and digestive power.

Along with root, mix *mainshil* powder, ghee and the cowdung juice. This is to be applied to the face so as to get rid of the freckles, black spots and disfigurements and increase the lusture.

Bijaura is an excellent fruit for making many types of sugar preserves that are all very tasty and

also highly medicative. Three such examples are given below along with their mode of preparation and use.

(i) *Murabba*: Take chunks of the inner core of a ripe fruit, sudate them in a steam of water and keep them in a thick syrup of sugar. After it ripens, this will form an excellent *murabba*. This is destructive of mental confusion and bile disorders. One can add aromatic substances like cardamom, nutmace and the like and preserve for years together, without any risk.

(ii) The rind of the fruit is also a favourite material for *murabba*. Take the chunks of this rind, boil them in water to soften. Remove when fully soft, squeeze out the water fully and keep them in a thick syrup of country sugar. This is a much extolled *murabba* of the Yunani physicians called *murabba taranj*. This is to be taken in a dosage of 2 to 4 *tolas*. It is stimulative, digestive and strength giving to heart and stomach.

(iii) Take steam sudated chunks of the fruit, dry them in shade and fry in ghee. Take *vamshalochan* (bamboo manna) 8 parts, cardamom 4 parts, *dalchini* 2 parts, *pippali* 1 parts and half part each of clove, nut meg, nutmeg and saffron (*keshar*), powder them all together. Keep the chunks and this mixture in a thick syrup of sugar candy, cook for a time, and then remove from the fire, cool and store in a suitable vessel. This is to be taken 1 to 2 *tolas* morning and evening. This is a very beneficial tonic.

Modern Opinion

All parts of the plant are medicinally used. The stamens are used to give a fragrance to tinctures and decoctions. As they are hot and destructive of *vata*, they are beneficially employed in flavouring the purgative drugs for indigestion and splenic disorders. It is much used to muffle the taste of drugs like quinine. The fruit juice is cold, stimulating, delightful and also effective against scurvy. The juice is much like that of orange, but this has a greater percentage of citric acid but less of fruit sugars. If the fruit juice is taken along with the food, the supply to blood will be in the form of alkaline citrotis, potassium salts and phosphoric acid. Origination of citrotis leads to carbolic acid and water.

Potassium salts and the phosphoric acid act on blood corpuscles. Because of this, uric acid is likely to get separated from urine and settle down to yield urinary stones. That is why, by consuming *bijaura* juice for a long time, both the digestive and the urinary systems are likely to get disordered to some extent.

Its beneficial effect on scurvy is well established. The fruit juice is an undoubtedly refreshing and effective drink in cases of burnings and thirsts that accompany fever. This causes expulsion of the body impurities in two ways: by inducing extensive sweating as well as urination. As it augments antiacid reactivity in blood, it is useful in rheumatism, sciatica, pains at the loins and other

atic disturbances. The juice is effective in haemorrhage following child birth and in persons affected with *lu*. To reduce the pains of rheumatism, its oil is applied externally. This oil is obtained from the rind by distillation and expression. It is pale yellow, fragrant, aromatic, bitter and soluble in alcohol. An essential oil is extracted by means of a sweet oil from the powdered rind. This is a stimulating liniment (thin ointment for wounds) and is also used in perfumery. A similar essential oil is obtained from flowers and leaves.

2. *Citrus medica* var. *limonum* Risso (Big sized) Lemon.

Names

Sanskrit calls this *limpaka*, *jambira* and *danta shata* (as the fruit is very sour and the teeth titters as one eats it raw).

This is known as *karnanebu*, *gora nebu* in Bengali; *jumbira*, *pahari nimbu* in Hindi; *jamburi*, *thorla limbu* in Marathi; *mohe nimbu* in Gujarati; *dodda nimbe*, *kanchi kayi*, *herale* in Kannada; *khuttia*, *gulgul* in Punjabi; *peri yelimiccham* in Tamil, *pedda nimba* in Telugu.

Botany

The tree is much like *bijaura* and *kagazi limbu*. Leaves are rather ovoid and winged towards the stalk. Flower is like the *bijaura*. Fruit is much pulpy like orange, very sour, the fruit rind is very rough and pronouncedly warty. It differs from the

lime in being bigger with a rough, thin and loose rind.

Two varieties exist. One is big and the rind is also rather thick - this is called *jambira* (*gadarangayi* in Kannada and Tamil). The other is smaller, the rind is thinner - this is the smaller *jambira* or *jambirika*.

Lemon is more important than lime in the Western countries. Its cultivation is also more. As far as the qualities and actions are concerned there are not many difference between the lemons and the limes. But the lime (called *kagazi limbu* in Hindi) cannot be kept for a long time while this can be kept fresh for six months even, if placed in a cool place.

Medicinal and Other Importance

In 100 c.c. of this fruit juice, we have 5.7 per cent citric acid, glycosides and the characteristic chemical hesperidine. From finely powdered rind of the fruit, yellow, volatile and aromatic oil is obtained, called citronila oil. In the bark of the stem and more so the root are secured greaniol and licealol. Lemon is richer in juice and citric acid than lime.

Medicinal properties as Ayurveda specifies are as follows. It is heavy, strong, acidic and hot in virility. It is an appetiser, a digestive and a regulative (*anulomana*) of the digestive tract by purging. It is employed in tastelessness, thirst, vomiting tendency, feeble digestive ability, cough

and breathing difficulty and also in worm infestations.

Some of the specific uses are as follows. Sugar and water is mixed with its fruit juice and given as a drink. In ague (burning fever, a fever with hot and cold fits) or malaria, a decoction of the lemon is prepared: 1 in 3 teacupfuls of water reduced by boiling to one cupful and allowed to stand all night in the air. This is strained and given the first thing on an empty stomach in the morning. It is a very valuable remedy.

This is also useful in acute diarrhoea of the hot places and in acute *amavata* or torpor or constipation of the bowels with bloating and swelling or gland formation. There are many symptoms of this condition such as pain at the ribs, sciatica, pains at the loins, and the hips. For overcoming these, the juice is mixed with *yava kshara* and honey and then drunk. In *amatisara* (a dysentery or diarrhoea produced by vitiated mucus in the abdomen, the stools being mixed with hard and fetid matter), drinking its fruit juice will evacuate all the mucus alongwith motion, cleans the intestines within 2-3 days and the affliction will stop. For scurvy the juice is drunk repeatedly.

In *amlapitta* or acidity of the stomach, fresh lemon juice is to be drunk in the evening. This also cures indigestion, vomiting tendency and headache due to *pitta*. For an aching ear, add a little ghee to the juice, cook on fire and use it as an ear drop when it is comfortably hot. The pain will disappear.

For copper sulphate poisoning, add sugar to the juice, and drink. This counteracts many intoxicants as well.

The rind of the fruit has many uses. This is hot astringent and antiseptic. The rind of the ripe fruit is stimulative of digestion, pacifying to pains and also overcomes flatulence. The oil from the rind is medicative but more highly prized as a flavouring agent for medicines. Given in 2 to 3 drops it is a good digestive. Still however it is not much used for this purpose. It is usually mixed with various types of ointments such as spiritus ammonia aromaticus and then used.

For skin diseases, take this oil 1 part, equal quantity of chalmogra oil and one hundredth quantity of pure camphor - mix them all and let the patient drink it in 5 to 10 drops. This is a very beneficial procedure even for leprotic ulcers. To get rid of pimples on the face, sun burns, pruritis of vulva and scrotum and dry eczema, glycerine is mixed with this oil and applied with commendable results.

Lemon is more used as a sauce in India i.e. as a dressing poured over food to add a taste. Best pickles are made from the about-to-ripe fruits, cut into pieces, and preserved in their own juice and salt as well as other *masalas*. This is also a popular and effective remedy for indigestion due to overeating or incompatible eating. In rheumatic affections such as *plerodynia*, *sciatica*, *lumbago* and pain in the hip joints, application of lemon

juice with impure carbonate of potash and honey is recommended by a classical author Sarangadhara. Lemon juice and gun powder are mixed together and applied over the scabies. Juice of the baked lemon forms an excellent remedy for cough when mixed with an equal quantity of sugar or honey and taken in teaspoonful doses.

An interesting way of taking the juice is as follows. Cut unripe but well grown fruit into two halves, sprinkle over the cut half a little bit of jaggery, salt or *saindhav* salt, prick it well so that the powders enter well within, expose this for some time to the sun and slightly bake over burning cinders. The juice starts simmering. At this stage, remove from the cinders and suck the juice from the whole half by squeezing it directly into the mouth. This a home remedy for indigestion and liver afflictions.

Fresh lemon juice is recommended to be taken for dyspepsia (i.e. indigestion) accompanied with vomiting and bilious headache.

Preserved with honey or sugar, lemons are good for sore throat. They act as a detergent. They are given before purgatives to prepare the body and then to check excessive action of the main drug. In almost all countries, lemon juice is considered an invaluable adjunct for routine food. Lemon has an important role in perfumery industry. The quality of Indian lemon is quite equal to that of the internationally famous Sicilian variety. It is the recommendation of the experts that a commercial

exploitation of this aspect of our lemon is much overdue.

3. Citrus medica (medicinal) L. var acida
Lime (Acid lime, Bergamot orange, Sour lime of India).

Of all the citrus fruits, lime is the most prevalently used-medicinally and in all systems of medicine and also as a household remedy. It is well known and popular everywhere. The rind of the fruit is thin and hence it is also called *kagazi* (or papery) *limbu*. Among all the fruits, lime contains the greatest amount of vitalising acids. Other fruits are sour or astringent in the early stages and become sweet on ripening and when ripening much, they develop many types of deleterious acids like lactic acid, butyric acid and oxalic acid. The sourness of lime is not of this type. Even when fully ripe, sourness remains the same. There is a proverb in Hindi: "If one eats lime every day and grows *tulasi* in the house, physicians and druggists will curse their fate and the god of Death will not show his anger in the house". Among the citrus fruits, lime is rather small, the rind is papery thin and shows innumerable oil glands on the surface and the whole juice is more tender. In the ancient classics like Charaka and others, *matulunga* (*bijaura*) and *jambira* are described and not the lime which is just regarded as but a variety of the former. There do occur some cultivation varieties in lime, differing mainly in the size and shape of the fruit but all are similar in their properties. The fruit is called a nectar or *amrit* fruit of the rainy

season as it wards off the epidemics of the season like cholera. The flowers and fruits appear at the end of the rainy season and the fruits ripen as the winter closes. In another crop, they appear at the end of the summer and the fruits ripen in the rainy season.

Several varieties are indigenous to the Himalayas. It is largely cultivated in many places such as Himachal Pradesh, Bengal, Assam, Maharashtra and South India. It is also a commercial crop in America, Europe (specially Italy) and many Asian countries.

Names

It is known as *jambha*, *jambeeram*, *nimbaka* and *limbuka* in Sanskrit. It is called *nembu* in Bengali; *limbu* in Punjabi and Gujarati; *nimbu*, *kagazi nimbu* in Hindi; *kagdi limbu* in Marathi; *nimbe* in Kannada; *nimma pandu* in Telugu; *elimicchai* in Tamil; *cheru naranga* (the smaller orange) in Malayalam.

Medicinal and Other Importance

Parts used are, root, leaf, seed, fruit, its juice and its oil from the rind, as well as from flowers and leaves.

Constituents: Lemon juice contains 7-10 per cent of citric acid, phosphoric and malic acid, citrate of potassium and other bases, sugar, mucilage and ashes. Lemon peel contains a volatile oil, 5 to 8 per cent hesperidine, a bitter crystalline glucoside

chiefly in the inner white of the rind and 4 per cent ash. The percentage of essential oil is less in lime than lemon. About 5-9 per cent of citric acid is available from a hundred c.c. of lime juice or 30 grains of citric acid in one ounce of the juice. The juice also contains 10.6 per cent of carbohydrates, 1.5 protein, 1.0 fats, 17 calories of heat producing energy in one ounce, vitamin A 26, Vitamin O.1 and vitamin C 63 milligram for every 100 gram. Besides these, there also occur potassium, magnesium, chlorine and many other mineral principles such as citrites, malates and tartrates. Hesperidine occurring in the fruit rind is a bitter crystalloid glucoside. The principle action of these substances in the body is to destroy, remove and expel the toxic substances; purify the blood and confer a new lustre to the skin.

General actions: Fruit is cooling and refreshing. Its juice counteracts scurvy, due to its rich citric acid. Pulp is acid and bitter. Rind is filled with a sweet essence. Inside the body, the juice enters the blood as alkaline citrates, potassium salts and phosphoric acid. Citrates are partly oxidised into carbonic acid and water. Potassium salts and phosphoric acid act upon the red blood corpuscles. They precipitate uric acid thus promoting a formation of urinary stones. If long continued therefore, citric acid impairs digestion and impoverishes blood. Citric acid is a natural antiseptic against fermentation in the stomach and the bowels. It is a germicide.

Ayurveda specifies its properties as follows. It is light, acidic, sweet in post assimilation, pacificatory to all the three *doshas* but slightly promotive of *pitta*, appetising, stimulative, digestive, regulative (*anulomaka*), thirst quenching, germicidal, purifying to blood and good for heart and the eyes. It is useful in warding off the effects of poisons, feeble digestion, indigestion and constipation; also, cough; skin diseases, burning sensations and cholera. Its best property is the germicidal nature coupled with a preventing of fermentation.

Lime removes the waste poisons of the body in all ways and easily. Nothing else exists like lime to purify liver. It is an efficacious home remedy for indigestion, burnings at the chest, diarrhoea and dysentery, belching, cold and breathing difficulties. But it is important that lime juice should always be taken all by itself and not along with other food stuff and it is better if this is taken on an empty stomach to get the maximum effect. The first action it carries out on an empty stomach is to destroy the fermentation organisms there and then enter the liver and the lymphatic system and break down all the waste matter there; the latter are the cause of many diseases such as rheumatism. This way the blood gets purified also. Simultaneously it cleanses the digestive system.

How to take lime juice? It is best to squeeze out the juice pressing the skin of the lime preferably with a squeezer press. For medicinal purpose, avoid unripe, half ripe or artificially ripened (by

placing in hay) fruits; they are harmful. Select only the fully ripe fruits. If squeezer is not available warm the fruits a little as this will render the rind and the pulp within, well softened so that the aromatic oil as well as the acidic nourishing salts can be pressed out together easily. If limes are not to be used immediately, they can be kept unspoil for considerable time either by placing them in wet sand or in water. The seeds are to be discarded while taking lemon as they are likely to cause appendicitis. Taking lime juice with the juice of other fruits for e.g. grapes is still better. Both the taste and flavour will change if taken with orange juice. If other citrus fruits are not available mix lime juice with pure water and consume. Sucking the juice alone is not advisable; it will generate heat. The juice is to be drunk on an empty stomach either in the early morning or in the evening. Taking it afternoon, specially after meals is harmful. Some presume that a still better way of deriving maximum benefit is to administer a mild purgative, clean the digestive system and then take the lime juice. Specially in digestive disorder it has to be drunk only on a hungry stomach.

Taking lemon along with meals is better avoided; it will aggravate *kapha*. But to take a little bit of its juice along with wet ginger and *saindhav* salt before the meals promotes appetite, hunger and digestion. A very tasty and beneficial way of taking lemon is as follows: Mix in its juice equal quantities of fresh ginger juice and also the juice of radish and onion - make the whole 1/2 kilogram in quantity. Add 60 grams together of all the five

salts, store in a bottle and keep it closed for seven days. This is best taken after meals in a dosage of 6 grams with an equal quantity of water. This confers many benefits and has a unique taste. Lime is to be taken in less quantity in winter than in summer; for, there will not be much sweating so that the expulsion of waste in that way does not give much scope for its beneficial action. As fresh limes are not available always, their juice can be extracted, stored in a bottle with an admixture of some almond oil. It can be preserved in this way for a very long time. When required, remove the oil, use the juice and replace the oil again. Or, take one *pav* of pure mustard oil in a bottle, fill in it half a *ser* of lime juice. For years together, the juice will remain fresh and the oil also will not get spoilt. And, this oil can be used to apply over eczema and other skin diseases.

A specially beneficial way of taking lime juice is as follows. Mix the juice of 2 to 4 limes in 1 to 1.1/2 *pav* of comfortably hot water and drink it by sipping with taste in the morning on an empty stomach. You can add honey as you like. If this is taken regularly for months together, extremely chronic disorder of blood will get totally eradicated. This will also remove constipation, tastelessness and feeble digestion. One should be observing fasts at intervals during this regimen.

Lime Juice Cure: There is a host of medicinal uses for lime juice over several ailments so that one can almost speak of a lime therapy as it were.

An idea of this multifarious utility is presented below.

In cases of the fever of malaria, influenza and the like, secure the juice, mix an equal quantity of water and keep it in a bottle. In another bottle, keep a mixture of 1 drachm of potassium bicarbonate and 3 ounces of water. Take a big spoonful of each one separately, mix them in a cup and immediately give it as a drink. This is to be done thrice a day. In fever accompanied with shivering fits, take 10 grams of eating lime powder, mix it with 25 grams of water in a glass or bell metal vessel and add the juice of one lime fruit. The lime powder will settle down. The upper water is to be slowly taken out, strained and given to the patient as one dose, an hour before the expected onset.

In fevers that appear daily or in a tertiary or quaternary (i.e. every third or the fourth day) manner, the course is as follows. Slice a lime into two an hour before the onset, sprinkle on one half the powders of black pepper, *saindhav* salt and alum.-all in equal quantity (4 *rattis* each)*, warm up this half on fire and let the patient suck the juice. After half an hour, the other half should also be taken in similarly. Fever will subside the same day. In case it doesn't, repeat this the next day. This is a very beneficial procedure for all seasonal fevers.

* 1 *ratti* = 1 *gunza*; 8 *gunzas* = 1 *masha*; 10 *mashas* = 1 *tola* = 10 grams, 24 *tolas* = 1 *ser* 1 *pav* = 1/4 *ser*

To prepare a lemonade for every type of seasonal fever, take 5-6 limes, remove the skin, cut them into two across, place the halves in a porcelain vessel and drop on them 30 *tolas* of well boiling water. When it cools down add sugar candy or country sugar in any desired quantity. The patient can drink this as much as he likes. This is good to seasonal fevers and fevers of the summer days. This is a very tasty drink that will also ward off vomiting, thirst, distress and obstructed motion. Another recipe for seasonal fever is to take 2.1/2 *tolas* (in small sips) of the juice mixed with an equal quantity of a decoction of *chirayata*.

In malaria fever, lime juice is added to strong, milkless tea and drunk. Or, a big sized fruit is taken, cut into 4 to 5 pieces, placed in 3 glasses of water in a vessel and cooked on a low fire till the water is reduced to 1/3rd. This is then removed, cooled, strained and drunk before the onset of the fever. This is more effective than even quinine.

In the fever of influenza, mix the juice of one fruit in a cup of luke warm water, add a little amount of *saindhav* salt and the powder of the three pungents *trikatu* and drink.

In cases of excessive temperature, vomitings, thirst and great upsets during fever, lemon juice to which sugar is added is given without any hesitation. If the fever is due to *pitta*, lime is cut, black pepper and sugar candy powders are sprinkle over the cut surface and the fruit is sucked. If it is a *kapha* fever mix *saindhav* salt in

place of sugar candy and the fruit is employed similarly.

Dysentery, Diarrhoea and Cholera

In dysentery due to indigestion, or when very frequent but small amount of motion is passing out, administer the sweetened lime juice or mix with its juice, onion juice and a little cold water and give this to drink. If vomiting is also accompanying, mix camphor with the sweetened *sherbet* and give 3-4 or even more number of times at an interval of an hour each time.

In ordinary dysentery, an enema is given with lime juice and water together. Lime is to be cut, sprinkled with salt, or *trikatu* powder, cooled over cinders and sucked. If one uses *hingvashtaka churna* instead of the *trikatu*, it is still better.

Lime juice is very efficacious in dysentery due to *kapha* and diarrhoea. Even a patient who has lost all hopes can be cured in a day by giving its juice upto 50 *tolas* the whole day. If there is too much mucus and twisting pains, administer 11 *tolas* of lime juice and 20 *tolas* of milk just hot from the udder. Mucus will be expelled, pains and burnings will disappear.

In cholera, one part of onion juice and two parts each of *pudina* or mint leaf juice and onion juice are mixed and given at an interval of half an hour. This is a sure and unfailing remedy. Or, mix onion juice with lime juice *sherbet* along with a pinch of camphor. For quenching the thirst during cholera.

cook 2 *tolas* of *saindhav* salt in 4 *serts* of water. When this is reduced to half, remove from the fire, cool down, strain and add 3 *mashas* of lime juice and store this in an earthen vessel. This should be continued to be given at intervals. The violence of the thirst will get quenched. To counteract cholera, if one keeps taking juice of two limes daily, one need not fear the advent of cholera at all.

Indigestion, Pains, Vomiting and Constipation

Take wide mouthed porcelain vessel, place a layer of lime juice in it, and a layer of *saindhav* or ordinary salt over it, again another layer of juice followed by a salt layer, close the vessel and keep it. Use this after a few days. This will remove all untoward effects of indigestion and kindle digestive fire powerfully and the lost taste will come back.

Take before meals small chops of wet ginger, 3 *mashas* of *saindhav* salt treated with 1 *masha* of lime juice. This will stimulate digestion; indigestion and constipation will disappear.

To check vomitings due to fermentation in stomach, lime is to be cut, sprinkled with sugar and black pepper powder and sucked. If thirst is more, only sugar will do. Or, mix one drachm each of lime juice and water and give. Or, take 3 *mashas* of lime juice, mix one *tola* each of clear lime water and honey. 20 drops of this is to be given thrice a day. This wards off indigestion, stomach pain and vomiting. This is an excellent medicine for those infants who vomit out milk repeatedly. 10 drops is

the dosage for an infant. Or, soak, 15 dry grapes in the juice of lime overnight, squeeze the juice of the grapes within and give as a drink.

For constipation, take 1 *tola* of lime juice, 10 *tolas* of water and 1 *tola* of sugar and mix. This is to be drunk for a few days at night, regularly. Constipation will disappear and the digestive system will resume its normal activities.

Scurvy

In scurvy gums of the teeth become spongy, weak; bleeding will start and the teeth will become loose. Anaemia will appear as well as glandular reddish clots on the scalp of the head. This is due to vitamin-C deficiency. Lime is an ideal medicine for scurvy. 8 parts of water is mixed with one part of lime juice and given once a day. This is good for plethora or *rakta pitta* whose typical symptom is nose bleeding which will stop by this procedure. Or add 20 *tolas* of water and 1.1/4 *tolas* of sugar to 2.1/2 *tolas* of the juice of a well ripened lime and administer morning and evening. Along with this, it is beneficial to gargle with lime juice and water mixed in equal quantities. Such a gargling is beneficial in overcoming the violent side action of the strong purgative *jamalgota* or *Croton tiglium*.

Or, take 4 ounces of lime juice, 60 grains of chlorate of potash, 6 grains of quinine, 2 ounces of sugar and 4 ounces of water. Mix them all and give 1 ounce of this drink 3-4 times a day. This is particularly effective in scurvy. The wholesome

dietary articles here are: lime, pomegrante, *jamun* and *amalak* fruits, orange, tomato-among the fruits, and the greens.

Urinary Disorders

In difficult urination, it is beneficial to give lime juice mixed with *yavakshar*, the excess of acidity in urine gets reduced. In obstructed urine, cut a lime into two, remove the seeds, fill it with *shora kalami*, cook on hot cinders and when it boils out, rub this around the navel when it is still hot. The blocked urine will get released.

Or, prepare two packets of 1.1/2 *mashas* of *yavakshar*, and 10 *tola* each of 2 glasses of raw milk. First squeeze half a lime in milk in one glass, place one packet of *yavakshar* in the mouth and drink this milk over it immediately. After some time repeat this procedure with the other packet and the glass. Do so for three days. This will ward off difficulties in urination and will also prove beneficial in gonorrhoea.

For a syphilitic patient, prepare a mixture of white *katha*, *kaladana* (black seeds of *Ipomea hederacea*), burnt fruit wall of the bigger cardamom, old betel nut - all one *tola* each and 2 *tolas* of *murda sing*. Powder them fine and treat this in lime juice. When the juice dries up, prepare pills like gram seeds (*chana*). One pill is to be taken in the morning along with water. During this regimen avoid eating bengal gram (*udad*) and *lauki* vegetable (*Lagenaria vulgaris*). This is a famous

Yunani medicine called "habba lime". This is very beneficial in syphilis and the attendant joint pains. If the syphilitic wounds are excessively painful apply a paste over them prepared by rubbing black *harad* fruit in lime juice.

For diabetes, extract the juice from 20 *tolas* of lime fruit, and drop in it *choti kaundi* (*varatikal*). Strain in the next morning and give this as a drink. Taken daily for seven days, this will cure diabetes in all ways.

To urinary stones, take 6 *mashas* of lime juice, 4 *rattis* of *kalmi shora* and 1 *masha* of ground sesame in cold water—once or twice a day for 21 days. The stone will melt out. The decoction of *kulathi dal* (*Dolichos biflorus* or horse gram) is to be taken as a salutary adjunct. Another recipe is to take the juice of 2 lime fruits a day.

Cough, Throat Pain, Catarrh and Headache

In case of such chronic cough where phlegm has become condensed and comes out with great difficulty, take a lemon, enclose it within a wet cloth and place it in warm ash for some time. Remove it when it is still hot, squeeze out the juice, add pure honey and administer 3 *mashas* each time, thrice a day as an electuary (*lehya* - to be licked). Phlegm will come out easily. In case phlegm is already coming out easily and in a thin way, taking lime in any form is *not* advisable.

By taking lime as such or warmed up as above and mixed with pure honey, 2 or 3 times a day as

needed will clear almost all the throat afflictions. If pure honey is not available, gargling well with a mixture of 1 part juice and 4 parts hot water cures throat pains. In catarrh or common cold and running nose, drinking the juice of lime cooked in warm ash as above, will stop the flow immediately. A fruit is to be slit out and the patient should keep smelling it. This also proves beneficial.

Cut a fruit into two, warm the halves, apply them on the head and the temples. Do not expose to direct wind. Headache will be removed. Another useful and quick remedy is to prepare a very strong tea, mix lime juice or pulp in place of milk and drink.

Skin Diseases

Mix the juice of 1 to 4 time fruits in 1 to 1.1/2 *pau* of comfortably hot water along with pure honey. This is to be taken regularly in morning on an empty stomach for a few months. This will eradicate fully chronic skin diseases and blood disorders.

Apply lime juice and the oil prepared from jasmine flowers over the skin. This will remove all types of skin diseases.

Rubbing with a piece of lemon and taking bath or adding lime juice and hot water with salt and then taking bath will bring out the lustre of the skin. If the skin has become dry and hard, keep it massaged with oil, add lime juice to bathing water and keep bathing in such a water only, for days

together. Soon, the skin will become soft. But meanwhile, take care to first treat if there is any germ infection or toxic substance that have caused this dryness. If there is a constipation, treat that first. If there is addiction to smoking and taking ganja, get relieved from them first. For, all of these are precipitating factors for skin afflictions. If this is due to *pitta* aggravation, keep taking lime juice with water 20 to 30 minutes prior to meals.

In case there are spots and freckles in the face or in any place on the body, an eruption, pus formation, or a clot due to some infection, spreading every where on all sides and causing much of an itching, keep rubbing these areas with a lime peel. Or, grind a *piece* of lime in neem juice, prepare a hot poultice and keep tying it over the regions. Beneficial effects are seen in a few days.

If there is an infection on the scalp of the head or small and numerous eruptions and boils appear there, or there is an itching, or hardness of the skin and dandruff is taking place, take 1 *tola* lime juice, mix with it mustard oil in equal quantity and keep applying this mixture. Along with this, first keep washing the area by rubbing it with curds. Within a few days, cure is brought about.

For boils over the head, prepare a mixture of 1 *tola* each of lime juice and cocoanut oil, add 3 *mashas* of camphor, and keep washing the area with this mixture. If one uses lemon juice instead of soap during bath, one will never get any skin

disorder; and, the skin will become reddish and lustrous.

For dark spots, freckles and wrinkles on the face, keep applying lime juice mixed with honey and also use regularly olive (*jaitun*) oil. Or, take 5 *tolas* of lime juice, 5 *tolas* of pure glycerine, 15 *tolas* of rose water and 1 *masha* of borax, mix them and store in a bottle. This is to be rubbed daily on the face at bed time. Boils, eruptions, pimples, dark spots, roughness and the like will all disappear and the face becomes beautiful and lustrous. This is excellent as a germ killer and also to bring out the colour. Or, make a mixture of the juices of lime, *tulasi* and *kali kasaundi* (*Cassia accidentalis*) and keep this in sun. When it becomes thick, rub it on the face. Or, mix milk and the powder of *kalaunji* (*Nigella sativa*) in lime juice, apply at night and wash in hot water the next morning. Or, cut a fruit into two, sprinkle *nausadar* powder on it, push this in with your fingers and rub with this half over the face for seven days. All freckles on the face will disappear. Or, when you are washing your face in the morning cut a lime, apply a little soap over the cut surface and rub this on your face in and massage and then wash in hot water. Within a few days all disfigurements will disappear and the face becomes beautiful. Or, mix turmeric and *lodhra* (*Symplocas racemosa*) powder in lime juice and keep applying this as an ointment. This will remove the wrinkles on the face within seven days. Even the spots of small pox can be removed by keeping

on rubbing with lime juice in which *murda shari* is finely ground. For itchings, eczema, scabies and even leucoderma lime has its uses. Itching will disappear if one keeps rubbing with lime juice in which turmeric and mustard are ground.

Take 2 *tolas* of lime juice and 5 *tolas* of jasmine oil. Keep them in a porcelain vessel, pound well. When a white coloured ointment is formed, rub with it at bedtime in the night. Next morning, mix wheat husk with lime juice, rub your body with this unguent now and then take bath in hot water. This will destroy dry eczema. Or, mix a little *multani* soil and the powder of black pepper in lime juice, anoint your body with this mixture and take a sun bath. After an hour or two, bathe in fresh water. Or, mix mustard or gingiley oil in an equal quantity of lime juice, massage with it and take hot water bath. Both of these measures are good for eczema.

Here is a specific medicine for scabies. Mix 10 *tolas* each of lime juice and gingiley oil, keep this mixture on a low fire, add a sprinkle of one *tola* of bee's wax and 2 *tolas* of country camphor and saffron (*keshar*). When oil alone seems to be the remainder, remove from the fire, strain it in a cloth when it is still hot. When this gets cooled down, add 3 *mashas* of chrysophanic acid, mix well and store in a bottle. Scratch in the area of the scabies and keep applying this mixture. Benefit will be seen soon.

Other recipes for the same purpose are as follows. Mix sulphur, borax and *katha* in lime juice and apply. Or, simply scratch the area 2 to 3 times a day and rub the area with a piece of lime.

Eye Diseases

In conjunctivitis (*abhishyand*) or eye sore when the eye becomes very red and painful, a lime is cut, a bit of opium and alum powder are sprinkled over the cut surface and this is tied against the eye. It will prove beneficial soon. Along with this, a drink of lime juice in which sugar candy and *saindhav* salt are mixed is also given repeatedly. This obviates eye affliction due to *pitta*. Or, take 10 *tolas* of alum, fry in an iron vessel add 3.1/2 *tolas* of opium and go on adding 40 *tolas* of lime juice little by little. Keep stirring till when all the juice is over, prepare pills. This is to be rubbed in water; heat it a little and apply all around as well as a little inside the eye. This is an excellent medicine for pain in the eyes and early stages of cataract (*dhalaka*) in which there is a great flow of tears. A simple method is to rub the lime juice well in an iron vessel and with an iron pestle. Apply this thickened juice as a thick ointment for the eye. This will remove the redness of the eye as well as the burning and the pain.

In early stages of cataract, add the juice of 2 limes to 4 *tolas* of butter from cow's milk, and thin the butter. When the juice is fully mixed, add some water and keep. This is to be done 25 times with intervals. Store this in a porcelain container and

close the lid. This is to be applied in a very little quantity on the eyes with a colyrium needle. Or, take 2 *tolas* of the seeds of *shirish* (*Albizzia lebbeck*), place them in a mortar, prepare a fine powder and go on thinning this with lime juice, till the juice of 10 fruits will enter here. This is to be applied for the eyes like a colyrium. The patient should be given *triphala* powder at night.

In the haziness of vision and cataract, take a piece of turmeric, place it in a porcelain vessel, squeeze the juice of one whole lime over it, place on fire and cook. When seven limes get incorporated this way, grind the turmeric to a fine paste. Mix an equal quantity of any colyrium (e.g. *surma*). This is to be applied at night with the needle. This is an Yunani advice.

In cases of early cataract appearing in the old after 70 years, give some drops of fresh lime juice over the eye daily at sunrise. If one keeps doing so, cataract will slowly dissolve and the power of vision improves. Tying lime halves sprinkled with turmeric and alum powder (sometimes with opium and sugar) over the eye and removing after two hours and doing this again at night will prove beneficial in redness of the eye, burning, pain and early cataract.

Mouth, Throat and Teeth Diseases

Mix 10 *tolas* of water in 2 *tolas* of fresh lime juice and keep gargling. This will cure, the peeling of the skin or sloughing of the mucous membrane

of the mouth and swellings of the gums. However, most usually the skin peeling is usually a sign of stomach upset and feeble digestion. Therefore this should be set right first. This is done by cleaning the stomach by taking 1-2 *tolas* of lime juice on an empty stomach in the morning. This itself will cure the oral symptoms. In extreme cases, even 12 ounces of juice can be given beneficially.

If one makes a habit of rubbing daily a bit of lime over the gums and the teeth, the possibility of scurvy, pyorrhoea, swellings of the gum and dental caries will not be there at all.

In case mouth is giving too much foul smell, mix one part of fresh lime juice with two parts of rose water and gargle morning and evening. Teeth will also get cleaned thereby and the very commencement of any pyorrhoeal attack will stop.

If there is pain in the throat, warm up lime juice, add pure hone and lick this up thrice a day. This is excellent for all kinds of throat pain. If pure honey is not available, mix one part of juice and four parts of hot water and gargle. This will remove pain and swellings of the throat. Lime juice with equal amount of water is an excellent gargle for bleeding gums and ulcerated mouth. During winter, lips often crack. For this, mix glycerene with lime juice and keep applying.

As An Energising Tonic

Take 20 dried grapes at night, clean, soak them in a glass of water, squeeze in it the juice of one

whole lime and keep it out in the open air. Next morning after the morning toilet, remove the grapes, eat them chewing well and drink the water of the glass over it. This is a very efficient tonic, as well as a beneficial remedy to get rid of chronic constipation, piles, many types of stomach diseases and gas troubles. The body strength gets much augmented. This is an excellent morning tonic, specially for the student who carries out his morning studies, regularly.

Or, cut a well ripened lime fruit into 4 pieces, squeeze one piece in to milk kept in a porcelain vessel and immediately drink. After 7-8 minutes take another cup of milk similarly squeezing into it another piece of lime. Consume all the four pieces like this. Carry this procedure out for a month. New blood will get formed, hunger will increase, chronic constipation will disappear and the strength of the body gets augmented.

Take *ajawan* in any desired quantity in a vessel and fill in it lime juice to such an extent that its level is an inch high over *ajawan*. Cover it with a very very fine cloth and place in the sun. When this gets dried, fill a similar quantity of lime juice. Do this seven times and store it safely. Ten *mashas* of this is to be taken daily. Strength will increase.

To Promote Dense Lustrous and Long Hair Growth

Mix the powders of the fruit of *amalak* or finely ground *gram dal* in lime juice. Apply this over the

head or rub the hair roots with it. This will render the hairs firm, black, shiny and free from all diseases. Excessive hair fall also stops. To reduce hair fall, rub the scalp with a peel of lime. Mix sugar with juice, apply over the head and wash after 4 to 6 hours. Dandruff falling will stop. Grind a hanging root of banyan in the lime juice and apply. After some time wash with water mixed with lime juice. Then apply coconut oil and comb. This will stop hair fall quickly and render the hairs long. Or, extract juice from three lime fruits, mix it with half a *ser* of coconut oil and boil them together over fire. Store this in a bottle and use this oil only for hair dressing. This will make the hairs black and dense. Hair fall will stop. This will also remove head lice.

Still More Uses of Lime Juice

There are many other uses of lime juice. An idea of them is given below:

A dosage of 4 to 6 drachms of this juice is a useful and refreshing drink in small pox, measles, scarlet fever (an infectious fever usually marked by a sore throat and scarlet coloured rashes all over) and other forms of fever where there is a very hot dry skin and much thirst. Its drink is advantageous in cases of haemorrhage in lungs, stomach, bowels, kidney and other internal organs. It is much useful in rheumatism and particularly rheumatic fevers. It offers a most likable acid to prepare effervescing draughts and beverages. It

does not merely cure scurvy; it is preventive as well. A drink of 1 part of juice in 8 parts of water and sugar is given twice daily for scurvy. It is consequently most useful for seamen and others who take long sea voyages. Hot lime juice is useful in colds and mild influenza. It is preventive of influenza as well as the tendencies to pneumonia. Lime juice in a dosage of half an ounce calms down hysterical palpitation of the heart. Half a lime fruit squeezed in a little water taken in heart burns relieves that distress. Diluted juice is useful in cholera, flue and fever. In fever it acts as a mild germicide.

An addition of lime juice to sauces, soups, gravies or stews, rice and pulses after cooking adds to the flavour and helps in digestion. Lemonade or orange ale made of oranges, lemons and limes is a valuable drink for gout, rheumatism, lumbago, sciatica and neuralgia etc. as it diminishes the acidity of blood, the citric acid being converted into alkaline carbonate in the blood. A glass of plain lemonade with no sugar and taken hot or cold before break fast and at bed time in the night is an excellent cleanser of the stomach and bowels as it has a slight laxative effect. For a bad cold the juice of two limes in a pint of boiling water, sweetened as required and taken at bed time is a magical cure. Take a drachm each of lime juice and water, mix two drachms of sugar to form an excellent linctus or *lehya* for dyspepsia and to get rid of vomiting. Weak lemonade is preferable to plain water for a diabetic patient to relieve thirst. But lime should

be avoided if it is a case of acid dyspepsia and gastric trouble. Lime or lemon eaten daily with salt is very beneficial in splenic enlargement. Lemon or lime juice with an equal quantity of olive oil beaten with an egg beater or a fork is said to be a good substitute for emulsion of cod liver oil.

There are many toxic effects to poisoning with croton oil seeds, castor seeds, physic nut and the fresh root of casava, mandioc or tapioca plant. A drink of 4 to 5 ounces of fresh lime juice at a time diluted with an equal quantity of *conjee* or plain water gives immediate relief to the purging, vomiting and other urgent symptoms of all such poisoning. In all cases of poisoning infact, lime juice should be tried first. Some relief will immediately come forth.

Lime juice, ginger juice, rock salt, black salt and *sonchal* salt are mixed in equal quantities and warmed. This is used as a snuff for expelling phlegm in fever complicated with pain in the head, throat and chest.

Externally for relieving the irritation of mosquito bites, chilblains etc., local application of lime juice is more effective than anything else. If applied to skin at bed time it is said to protect from mosquitoes. For pains such as back ache and neuralgia, the parts concerned are rubbed with a cut lime. A local application of 5 parts of lime juice, 4 impure carbonate of potash, 3 copper sulphate and 4 borax is useful for warts and tumours. Oil expressed from the rind of the fruit is called

Bergamut oil as lime is also called Bergamot orange in English. This is a big industry now in Europe. Essential oil from flowers and leaves is used to adulterate pure Bagamot oil. Both the oils are useful as efficient, stimulating liniments or thinly applied ointments.

Home Remedies

There are innumerable household uses of lime. Here are few of them. Lime fruit promotes digestive ability, quenches excessive thirst, removes tiresomness and is highly refreshing. Mix sugar in lime juice and be licking it up in little quantities to quench vomiting tendency. It cures aggravations due to *pitta*, rectifies errors due to blemishes in blood and quietens the body from distresses that may arise due to consuming intoxicating substances.

A fruit of lime is a mine of Vitamin C. Fruits that are pale yellow, small sized and perfectly spherical do not contain much juice. However, it is these fruits that are most praised medicinally. Lime fruits constitute a very effective household remedy for a varied type of afflictions.

Add to a tea spoonful of lime juice an equal quantity of white onion juice. Taking this thrice a day will cure malaria disease. If you are suffering from an abrupt indigestion take a teaspoonful of lime juice in water to which a pinch of eating soda is added. You will soon feel the relief. A simple measure for safe delivery and without much pain is

o let the pregnant ladies take a glass of lime juice daily.

If one is feeling very thirsty because of excessive fever or due to fatigue or in hot days of summer, taking lime *sherbet* is most beneficial. Prepare a glass of *sherbet* adding six teaspoonful of sugar and squeezing one whole lime fruit into it.

Lime juice always promotes hunger. It will cure distresses and pains in the stomach that arise due to indigestion. This will also stop colicky pains in the belly and vomitings common in a pregnant lady. Lime juice is beneficial to cases of diarrhoea and also piles; but for this, using salt instead of sugar is preferable. For an aching ear, mix in equal quantity the fresh juice of *tulasi* leaves, lime juice and gingiley oil. Boil them well and cool down. Place a few drops of this mixture in the ear when it is still luke warm. Do so twice a day for couple of days. Paining will stop down.

Make it a point to use lime along with a meal of fish. This will digest out fish bones in case they are still remaining in the food. Lime juice is an antiseptic drug capable of killing many disease causing bacteria. It is an admirable practice as is done in a Maharashtrian meal to include a bit of lime invariably along with cooked *tuwer dhal*.

Mixing a teaspoonful of lime juice to a cupful of tender cocoanut water and taking this twice a day is a good measure to get rid of too less an amount of urination.

Taking together honey and lime juice in equal quantity prevents head ache, chest pain, sensations of burning at the chest, stomach upsets and dizziness of the head. Make it a habit to take a cupful of buttermilk in the morning as you get up from the bed in which a fruit of lime is squeezed. This improves your health remarkably and will also promote your facial lustre. Mix eating soda and salt in equal proportion. Add this mixture in lime juice and clean your teeth and gums with it. They will be rendered strong, durable and clean. Bleeding if any will also stop. Take a cupful of warm water and squeeze a whole lime into it. Add to this four teaspoonful of honey, one fourth teaspoonful of salt and stir well. Give this to patients suffering from violent tonsillitis. He is best advised to go on sucking this *sherbet* slowly. This measure will prove quite relieving. Drinking this daily at night will prevent the infection of cold and catarrh. This will also ensure a freedom from troubles of indigestion. Stomach ache caused by indigestion can be cured by drinking lime juice to which a pinch of eating soda is added.

Lime juice is a magic medicine for scorpion stings. Place a crystal of potassium permanganate at the region of the sting. Pour a drop of lime juice over it. Within ten minutes the burning and the severe pain will disappear.

Drops of warm lime juice mixed with water when placed into the ear which is aching and giving out a discharge of pus is a simple expedient to stop the

discharge. Going on pouring lime juice drop by drop into ear will also overcome the pus oozing out.

Lime has many uses against varied afflictions of skin. Mixing sulphur powder with lime juice and applying over the affected parts will cure scabies, itching and particularly psoriasis. To prevent cracklings of skin during winter, add a few drops of lime juice to the cream of milk. Apply this gently over the face and wash your face after fifteen minutes. Your skin will become supple and will not crackle henceforth.

Take a cupful of good quality milk and boil it well. Squeeze a whole lime fruit into it. Add a teaspoonful of glycerine to this milk. After half an hour apply this mixture to pimples on the face, cracked feet or rough palms. It is best to carry this out before going to bed at night and spend the whole night that way. The afflictions will disappear, skin will become supple and also lustrous, soft and healthy. Another cosmetic use of lime juice is as follows. Mix lemon juice with coconut oil and gently massage your skin with such an oil. The skin becomes soft and lustrous.

Before you take an oil bath, rub your head with soap nut powder in which lime juice is added and then wash. This will remove out any dandruff from the scalp. Hairs will also become soft and glossy. Another measure towards the same purpose is to dry some pieces of lime, powder them and mix this powder with soap nut you use for oil bath.

Squeeze half a fruit of lime into half a cup of cold water. Add a teaspoonful of well powdered cumin and cardamom. Stir this mixture well and keep taking this once in two hours. This will stop all upsets of the stomach and will also quieten down vomiting tendencies.

Keep washing ulcers with lime juice. Quick relief is sure to be seen because of the antiseptic property of lemon. It is said that a constant use of lime is beneficial even against cancer. Applying the juice to gums will calm down the tooth ache. This juice is a sure cure to the infection of scabies. For scurvy disease this is an ideal remedy. The softened gums that continue to bleed in this disease of the deficiency of vitamin C react very effectively for a constant use of lime juice. The disease gets totally prevented. Lime juice acts as an antidote to poison. Children suffering from diphtheria will get relieved greatly by gargling with lime juice. The coarse membranous covering that appears at the throat in this disease gets destroyed thereby and the pains at the throat, will disappear. For corns growing at the soles of the feet, a measure of treatment is to place over half a lime fruit before you go to bed at night and tie well and sleep. You will find that the next day all vitiated substances within the corn as well as pus will come out and the wound would get healed. For pimples on the face that have become sprouted, wash them well in lime juice. They will fall down from the root and the face becomes lustrous.

Another effective facial cosmetic procedure is as follows: Take two spoonfuls of the cream of milk. Add to this the juice of one fourth of a lime fruit and mash the two together and well. Apply this as a cream over the face at night before you go to bed. Wash your face with cold water next day morning. Adopting this measure for a month will double the beauty of your face, increase the lustre of the skin and you will feel very lively throughout.

Lime cools down the heat of the blood, stimulates liver and renews bile juice. It is no wonder therefore that this common fruit is efficiently medicative in varied diseases. By consuming lime fruit regularly, a pregnant mother can ensure good development of the bones of the foetus as well as a valuable nourishment for its brain tissues. Taking three to four spoonfuls of lime juice will reduce excessive haemorrhage during mensus.

Washing one's eyes with water in which a few drops of lime juice are mixed will clean them well and augment their shining.

A patient of breathlessness will secure great relief by taking lime juice before meals.

The distress of severe rise in temperature in a patient of fever will get quietened down by a drink of lime juice.

Take a teaspoonful each of table salt, dry ginger, cumin seed and sugar. Grind them fine. Add this

powder to half a cup of hot water, squeeze a lime in it and take. This will stop stomach pain.

Grind two to three cloves well and mix this powder with lime juice. Gently rub the paining gums and teeth. Tooth ache will calm down. Mixing lime juice with water and consuming it thrice a day will remove all indigestion. Squeeze a quarter of lime fruit into a cupful of warm water and drink it in the morning daily. Adopting this measure for about a week would stop dizziness of the head. A medium sized lime fruit should be wholly squeezed into a cupful of cold water. Taking this juice for four to five days will eradicate burning sensations at the chest. Consuming one lime a day in this manner during summer is a good method to reduce excess fat in the body and to reduce the weight as well. This is a simple but an excellent slimming down measure for all those who are obese.

Prepare a paste of sandal wood by grinding it with a little quantity of water. Mix this paste in hot water and stir well. Add some lime juice to this water and gargle well. This will remove all foul smells of the mouth and also render the gums strong.

For preventing excessive hair fall, rub the scalp of the head well with lime juice. Wash after half an hour in cold water. Adopt this procedure at frequent intervals. Falling of the hairs will be prevented. Rub the face disfigured with pimples by means of the rind of lime fruits. This proves

beneficial after a few attempts. Grind young leaves of lime along with turmeric into a fine paste. Apply this as a face cream. Pimples would vanish away and the lustre of the face will get heightened. Dry such rinds of lime fruit quite well. Set fire to them afterwards and powder. Mix salt with this powder well and store. This constitutes as excellent tooth powder.

There are many useful external applications of lime. In cases of scabies, psoriasis, itchings and many other minor skin affections, take equal proportions of turmeric, *tulasi* leaves, salt, cow's urine and lime juice. Grind them all to a fine paste and apply twice a day. Improvement can be soon seen.

Take tender leaves of lime, grind them to a smooth paste, mix this paste in gingiley oil and boil that oil well. This oil now is a very effective medicine for joint pain, muscle pain and also the pains due to spraining. Apply the oil over the affected parts and massage well. Pain will soon disappear.

Take lime leaves, sweet neem leaves, tender mango leaves, *Calotropis* leaves, *tulasi* leaves and also the leaves of bael or *bilwa*. Boil them all together in water and decant out the decoction. Add this to comfortably hot water and take a bath. After the bathing is over, remove all wetness of the body by pressing well with a dry cloth. Sprinkle sandal powder all over or apply sandal paste and rub. This is an excellent measure for all types of

itching and scratchings and also psoriasis and for the maintenance of skin health.

To get rid of acidic belchings take the juice of a whole medium sized lime. To get rid of vomitings keep licking little quantities of sugar mashed with lime juice. To get relief in severe burnings associated with urination, squeeze half a lime into a cupful of boiling water, add a spoonful of honey and take.

Taking a teaspoonful of lime juice along with well ripened plantain fruit and honey proves beneficial in jaundice, dysentery, diarrhoea and piles. Lime juice is advantageously taken in during sea-sickness, vomiting, upsettings during travelling, tiredness, headache and shooting pains in the head, burning sensations at the chest and whooping cough. Lime fruit is a sure medicine for joint pains. Mix equal quantities of lime juice and castor oil and massage the affected parts with this mixture. The pain will disappear. If in the meanwhile, you keep consuming a teaspoonful of lime juice added to a cupful of hot water and honey, the relief seen becomes quicker.

Take about thirty juicy lime fruits, cut each into two. Fill these halves with table salt and dry them for a fortnight in sun. Powder these dried pieces and store the powder in a dry tightly closed bottle. Take a teaspoonful of this powder daily in the morning and on an empty stomach. Such a measure continued for a month will ward off blood pressure.

Take a medium sized lime fruit, squeeze out its juice fully and add half its quantity of pure castor oil. This is a good remedy for getting rid of twisting colicky pain of the stomach and secure the much needed relief.

Mix a little lime juice with water and drink thrice a day. It will remove indigestion. In case you feel upset in a motor journey and cannot tolerate either the smoke or the smell, smell a few crushed leaves of lime. You will feel alright.

A wonderful property discovered recently from the lime rind is that it can protect one from the deleterious effect of x-ray radiation. Scientists in Florida have successfully experimented on mice and shown that this can protect them even from atomic radiation and this effect was also seen to be beyond their expectation. It has become a practice in the States now to powder the lime peels and mix this powder in most food stuffs and eat. The rind is also rich in proteins, fats and many types of minerals. The powder of shade dried rind is useful in insanity and confused states of mind; take 6 *mashas* of this powder, soak it overnight in 40 *tolas* of water, add sugar candy in the morning and give it as a drink.

4. Citrus medica var. limetta W & A Tree Sweet Lime

The tree is quite similar to lime or *kagazi limbu* in appearance, flowers and leaves. But the leaves are bigger. Flowers appear in the month of April, they are white with slightly reddish spots

and fragrant. Fruits come out in June, they are bigger than lime and rather pressed down on either side, spherical or more usually a little oblong, 3-5 inches in diameter and reddish yellow when ripe. When young and unripe, the fruit is slightly sourish sweet but when ripe, it is excessively sweet with no touch of sourness. The rind of the fruit is very thin, slippery, rough, mostly loosely attached to the pulp.

This is found in many parts of India, specially in Kumaon Hills in the North and the gardens of South India.

Names

In Sanskrit this is known as *mishta nimbuka*, *madhu jambira*, *sharkaraka*-all stressing the sweetness.

This is known as *mitha lebu*, *chota chamtr*, *kamala limbu* in Bengali; *mitha nimbu*, *mittha*, *sharbati neebu* in Hindi; *sakhar limbu*, *god limbu* in Marathi; *dodda nimbe* or *gaja nimbe* in Kannada; *pertya elmiccham* in Tamil; *peddanimbain* Telugu.

Medicinal and Other Importance

Ayurveda recognises its properties as heavy, unctuous (oily), sweet, sweet and sour, sweet on post assimilation, cold in virility and pacificatory to *pitta*, quenching to thirst and appetising. It is useful in the diseases of anaemia, disorders of blood, plethora; seminal debility; and the disorders of fever and poisoning.

Fruit is extensively used as a cooling and refreshing agent and in fever and jaundice. This has a sweetish taste at all stages like sugar and water. It is eaten fresh or preserved. Still however it is not so much valued medicinally as the sour lime.

A swab of cotton is dipped in its juice and applied at intervals of 2 hours in cases of diphtheria in children and tonsillitis.

In cholera two *tolas* of red chilly seeds are gradually crushed and mixed with half a *ser* of this juice and stirred continuously till a consistency from which pills can be made, is attained. Pills are of the size of $1/2$ *ratti*. Giving 1 or 2 pills is definitely beneficial. For preventing vomiting, dried fruit is roasted and converted into ash. This is given with honey. This checks down the vomits of cholera also.

The rind is ground, mixed with butter and applied and massaged over the face. This gets rid of the pimples, freckles and black spots.

A few compound preparations or *yogas* are the following:

Pills of Sweet Lime: Soak 5 *tolas* of gram in one *ser* of the fruit juice in a bell metal vessel for 5-6 days. Close the vessel with a tight lid. Keep the grams with the juice in a mortar and pound well, adding 5 *tolas* of the powder of *ajawan* and 6 *mashas* of camphor. Prepare pill of 5 *rattis* weight.

dry and store. 3-4 pills are to be eaten in cases of digestive troubles, flatulence and constipation.

Pickles of Sweet Lime: Cut the fruit into 4 pieces. Add 20 *tolas* of jaggery and 10 *tolas* of salt in one *ser* of the fruit. Keep in an earthen ware jar for medicines (*martaban*), place this daily in sun, stirring it 1-2 times. Pickles will be ready in a month. This is an excellent pickle, digestive as well as appetising.

Or, squeeze out the juice of 50 fruits, strain well, add 1.1/2 *ser* of country sugar, 20 *tolas* of *sambhar* salt, 10 *tolas* of black pepper and 5 *tolas* of cardamom after grinding them. After a month, an excellent digestive *rayata* or gravy is formed.

Murabba or Confection of Sweet Lime

Take a *ser* of sweet lime juice. Keep this in lime (*chunam*) water. Take this out after two days and wash and heat on fire. When it becomes hot, mix with a syrup of 4 *sers* of sugar. An excellent *murabba* results. This is very tasty, very agreeable and removes weakness of the body and is highly beneficial in the aggravation of bile or *pitta*. But this should not be used by persons of cold, constipation or when one is having a cold and running nose. The aggravation of phlegm will increase thereby.

5. *Atalantia monophylla* DC Wild Lime

Though this does not belong to the genus *Citrus* which includes oranges, lemons and limes, it

becomes necessary to consider it here, as it is always referred to as wild lime in many languages and also used rather similarly.

Names

Sanskrit calls this *atavijambira*.

It is known as *atavijambira* in Bengali; *nibu jangli* in Hindi; *ran limbu*, *makad limbu* (monkey lime) in Marathi; *dodi nimbu* in Gujarati; *kadu nimbe*, *dodda huli* (the greatly sour) in Kannada; *kathu elumicchai pazham* in Tamil; *male narakam* in Malayalam; *nargumi* in Oriya.

Botany

This is also lime like small sized, spiny tree. Leaf is 1-2 inches long, rather thick at the end and fragrant. Flower is white and lime like. Fruit is spherical, with 4 cells every one having only one seed and yellow like lime when fully ripe. Seeds are specially fragrant. Flowers are in October, November and fruits in February.

This is found in many parts of South India such as Konkan, Karnataka, Tamil Nadu, West Coast and Orissa and Sylhet in the North. It also occurs in Sri Lanka.

Medicinal and Other Uses

This is hot, sour, pungent, appetising and useful in destroying germs as well as curing *kapha* aggravation.

Fruits form an excellent pickle. This is given in the form of a *kadi* and as a salutary diet for patients of fever. It is a good appetiser and is used in loss of appetite, taste and hunger.

Leaf juice forms an ingredient in a compound liniment (thin ointment) used in hemiplegia. It is also used alone to massage such patients. A thick decoction of the leaves is useful in itching and other skin diseases.

Fresh seeds are powdered and mixed with any sweet oil. This will turn it yellow and fragrant. Such an oil is used for massaging which will create heat in the body. It is beneficial in chronic *vata* diseases. An oil is extracted similarly from the flowers useful for application and massaging in cases of glandular swellings and paralysis.

Root is antispasmodic (counteracting involuntary contraction and expansion), stimulant and believed to be useful in snake bite.

D. CASTOR - ERANDA

Castor is an important plant on three accounts, medicinally, ornamentally and industrially. Its medicinal value mainly as a purgative is well known from remote times. The plant is so profusely grown and horticulturists have worked so much on it that there are many varieties of castor that are picturesque and pretty. In the United States it is more a favourite ornamental plant than an oil yielder. Castor oil is a versatile oil. Though it was mainly used in medicine previously, 90 per cent of

oil production, specially in the developed countries is now used industrially in the manufacture of some 25 types of different useful products. It is water resistant and therefore used for coating fabrics and for protective coverings of aeroplanes, insulation, food containers, guns and so on. It is an excellent lubricant specially so for aeroplane engines. On hydration, it is converted into a quick drying oil which is employed extensively for manufacturing paints and varnishes. There are many other uses of this superb oil. It is used in making soaps, inks and plastics, and also to preserve leather and in addition as an illuminant. It is not merely the oil that is useful though it is the most important product of the plant. Leaves have insecticidal properties and as such are used in pest control, specially for the standing crops and the stored grains. The stalks and the twigs of the plant are a good source of paper pulp and cellulose. The oil cake is somewhat poisonous but forms an excellent and valuable manure.

Castor is an important commercial crop of our country cultivated extensively. Still however this is not believed to be indigenous to India but comes from Africa.

It is presumed to be a plant originally coming from Africa where it actually occurs as a forest plant. But this is now cultivated very widely in most warm parts of the world and this has been so from very early times. Its earliest written reference exists in Chinese literature of Tang period-618 to

906 A.D. There is ample proof to say that Egyptians had been using castor and extracting oil to light their's lamps since four thousand years. Egyptians of marshy places had been using the oil even for massaging. The early European herbalist Dioscorides mentions its use in expelling worms from the stomach and in bringing about a vomiting and a purgative effect. Nonetheless, castor oil took much time before its fame became well known all over the world. The use of castor was well known to the classical authors of Ayurveda like Charaka and Sushruta. Sushruta recognises two varieties in it—red and white and also specifies many uses of the fresh parts of the plant in various ways. Castor did form one of their many famous purgative drugs. It is interesting to note that even now in the interior forests of the outer Himalayas, castor grows in a wild state, much as it does in Africa. It is not probably wrong therefore to claim that along with Africa, India also must have been a native country for this valuable plant.

It is only since thirteenth century that European medicine has started acclaiming the value of castor oil. This popularity can be traced to one specific article written by a physician named Peter Kenwen, who had been practising in West India for a long time and wrote forcefully as regards the castor oil and its comfortably purgative action. From then on however, its popularity increased and the plant soon secured a place in the official pharmacopea of many countries. The initial European supply of

castor came from Jamaica but soon India became an important supplier.

Names

Sanskrit offers a large number of names indicating the popularity of the plant and many refers to the characteristic leaves. There are many names indicating the varieties.

In Bengali, this is known as *bheranda*; in Hindi and Marathi as *eranda*; in Punjabi as *aneru*, *hanoli aranda*, *arinda*; in Gujarati, as *erando*; in Kannada, as *haralu*; in Tamil, as *amanak chittamani*; in Malyalam as *chittamanakku*, *eranda thailamu*, *amidamu* in Telugu.

Botanical Aspects

This is an always green small sized tree or a big sized shrub. There is a famous proverb in Sanskrit "in a region which is treeless, castor becomes called as a tree". Leaves are its characteristic and identificatory features. They are large, well uplifted on long stalks and about 10 to 30 centimetres long. Lamina is palmately lobed, large, the margin, teathed, the teeth pointing towards the end. Leaves have an attractive reddish hue, specially when young. Flowers are either male or female both occurring in the same cluster. Fruit is a special type of capsule, dry and dehiscent, breaking open with a sound to expose the seeds at maturity.

As the plant has been under cultivation all over the world since a very long time, there occur many

varieties in castor. Some of them are beautiful creations of horticulturists - only of the last century, specially in their attractive leaves and tender shoots. About 16 varieties are recognised all over the world; among them, many are not very clearly distinguishable from others. Two prominent varieties recognised almost by all are the following:

One is the bigger variety, living for many years, almost a tree and mostly grown as a border plant, chiefly to give shade to other tender crops all around the fields. Fruits are bigger, seed is red, big and yields a greater percentage of oil, nearly 40 per cent. But the oil is of an inferior variety, mainly used for burning and lighting purposes and also as a lubricant to machines. The other is much smaller and an annual shrub. This is well cultivated in the fields often alternating with other crops. The seeds here are smaller, white and with brown spots all over and yields 37 per cent of oil. The oil is of a superior quality and is mainly used in medicine.

There is one more variety which can be called sweet or edible castor. Its seeds do not contain any toxic principles and they yield an oil which can be used like a cooking oil. Chinese do use a type of castor oil for cooking. The fruits are glossy and slippery. It is said that the Negroes of Africa and West Indies know of a castor much useful for producing cooking oil. There is a reputation that people along the Jhelum river use castor seeds as a condiment. The purgative property of castor is not known in Khorasan; castor is mainly used there for burning purpose.

Yunani system mainly recognises two varieties, the red and the white, the red being more efficacious. Ayurvedic writers recognise red, white as well as the big and the small varieties; the big or the *sthula eranda* is regarded as more effective.

Though castor is mainly a cultivated plant in India, very commonly it is found to be growing on its own as an escape, specially in waste places near human habitations.

Commercial Aspects

Castor is very extensively cultivated in India and forms one of its important export material since a long time. India was an exclusive supplier once to the States and Great Britain. Many countries have now started its cultivation, such as warmer parts of North West Indies and America as well as Italy. Castor oil is used in great quantities all over the world more for industrial purpose though its medicinal use is also of great importance. India still remains an important centre of World's castor production.

Properties and Constituents

Castor oil is viscous, thick, sticky, colourless or light yellow. Smell is light. It tastes sticky and slippery and is tasteless to start with but afterwards pungent and distasteful. It does not dry and evaporate even in thin layers and is fully soluble in absolute alcohol, ether and turpentine.

Seeds contain 45-52 per cent of the fixed oil, 20 per cent proteids and 10 per cent starch, mucilage, sugar and ash. The oil chiefly consists of ricinoleate of glycerol or tri ricinolein, which is a mixture of glycirides of ricinoleic and isoricinotecic acids and a small quantity of palmitin and stearin. This oil is found in the white kernels of the seeds. There also exists a very toxic substance ricin in the seed but not in the oil. Besides, there is a viscid oil, the purgative principle. Unlike most fixed oils, castor oil has a remarkable capacity of mixing with absolute alcohol and glacial acetic acid in all proportions; this improves the utilisability of the oil to a great extent.

There are two methods of extracting oil:

Cold Method: Seeds are beaten and the oil is pressed out without the addition of heat. The oil secured thus is colourless or faintly yellow or straw coloured, practically odourless and has a bland and slightly acrid taste. Both taste and flavour gets spoilt in the oil expressed after boiling the seeds and the oil itself becomes rancid much sooner.

Hot Method: The hard coats of the seeds are removed, the inner kernel is ground and is then boiled in water. The oil that floats on the water is skimmed out and strained. Again this is mixed with little water and boiled to remove the bitter principle. To secure greater amounts of oil, seeds are repeatedly roasted; but this will render the oil

bitter and brown. The common hot pressing process consists of having a slow fire burning under the mill. This liquifies the oil and increases the yield. The oil is bleached by exposing it to sun and is clarified by boiling with water which process coagulates the proteins and dissolves out the mucilaginous material.

Several qualities of oil are available in the market. The best for medicine is what is secured by clearing and dehusking the seeds with hand, drying in the sun and then breaking in a crushing machine. The advantage in this process is that it is simple and the acidity and nauseousness associated with oil will be avoided thereby. The oil from the perennial variety is darker and thicker than that from the small seeded annual type. There is a method to purify raw castor oil. Grind animal charcoal to a fine degree and mix it with crude oil. Place this in glass or porcelain jars, expose to sun for a fortnight successively. All the impurities would be absorbed by the charcoal. On filtering, a refined oil is obtained.

Non-Medicinal Uses

Since very ancient times castor oil has been used in India for burning lamps. This is considered the best oil in India for such lighting. In this respect, this oil is believed to be giving more cooling, clean and excellent light than any other oil, other vegetable oil like linseed oil or mustard oil, or mineral oil like kerosene, or even animal oil. Moreover, it burns at a slow and steady rate, so

that the cost gets reduced by one fourth or even half. There is absolutely no risk in using this oil for lamp light, for which purpose therefore it is the best available oil.

To preserve skin, hides and all leather goods, applying a coat of this oil is the best means one can think of. This will keep these articles safe from rats and mice and would not spoil their polish. Indian workers have been using castor oil as an adjunct material in preparing many types of dye stuffs. This is also used in printing over fabrics.

But the best use of oil is because of its remarkable lubricant property; it resides almost permanently in the form of a non-evaporating film. It is used in all types of machine and watches, big or small, wherever an unobstructed motion is desired.

This is the cheapest and the best oil for making all types of soap and also hair oil. The reason is: it is one of the best substances for an external application, keeps the head cool, renders the pores on the skin open and smooth and firms up the roots of the hair.

The cake remaining as a residue after oil extraction is a good burning material. In many places in India, where the available amount of coal is less, a type of gas is prepared out of this cake which is useful just like coal gas and in some respects, better than it. The oil cake is rich in nitrogenous material. It is therefore in great

demand as a fertiliser to the fields. It has been found that using castor cake as manure will increase the yield undoubtedly and to a considerably great extent. Since it contains oil as well, the nutritious substances get released in a gradual way which is excellent for the growing crops.

Some consider that feeding milch animals with this cake increases the milk yield. But European dairymen opine that this may have dangerous effects. However, by heating for a few hours in a temperature of 115° , the cake becomes pest free; the harmful ricin in the seed will be destroyed thereby. The cake is an unfailingly good feed for pigs. Cows eat the leaves of castor with relish. In Tamil Nadu, feeding cows with the leaves purposefully is a method to increase the milk yield. For the buffaloes, the leaves are given in plenty; even a drink of the leaf juice is administered for this purpose.

Castor leaves are fed to silk worms in Assam just like the mulberry leaves. From the branches, the stalks of the leaves and the stem bark, a good quality of paper is prepared there.

Even the dried castor plants are much useful. Along with the oil cake these are useful in preparing jaggery out of sugar cane juice and also as excellent burning materials.

Though castor is a weak and fragile plant likely to break in any strong wind, if the stems are cut

and dried, they become strong enough. In this form they are much used in India as a thatching material for huts instead of bamboos or as an adjunct in making mortar walls. An additional advantage is, they are insect and termite free.

Medicinal Uses

Castor oil is a harmless, safe, wholly dependable and active purgative that can be given to persons of all ages and types of constitution without any hesitation whatsoever. Its employment is not attended with any untoward effect or heat formation unlike many other purgatives and the action is clear cut and definitive. It is so safe that this is probably the only purgative that can be given without any fear to the pregnant, or, soon after delivery, to patients of piles and anal fistula, very delicate ladies, infants, the aged people or those who are very weak. For all, it is safe and excellent. In cases of surgery of stomach region, pelvic diseases, fever, constipation of intestinal fever and before or after administering a dose of santonin to expel the worms-using castor oil for purgative purposes is the safest. For three weeks continuously castor oil is given to new born infants in very small doses. Sushruta extols the use of castor oil to pacify all diseases of the lower parts. Even flowers are used as purgative drugs. Root bark is also reputed to be purgative. There is a veterinary use of castor. The root bark is ground along with some red chillies and tobacco leaves

and made into balls like a lime fruit. These are given as a medicine for constipation of the horses.

For dysentery due to undigested food in infants and the aged, giving one dose of oil is adequate and profitable. Some amount of a tincture of opium is added along with it. For stomach patients, purging is to be effected with milk prepared with this oil. In cases of retention of faeces (*udavarta*) oil is given in soup or a juice of *triphala*. To get rid of the shooting pains, drinking of a decoction in water of the castor root and dry ginger in which *hing* and *saurchal* salt is added will be giving a quick relief. Giving the oil in *corjee* water or *varuni* liquor is advised by Charaka for patients of splenic disorders, and if it is a case of splene affliction due to *vata*, giving oil with milk is better. In cases of anal and rectal prolapse, oil is given as an enema very successfully.

This is an excellent medicine, for acute dysentery. This is best given in the initial stages itself and if opium is mixed with it the often attendant sprains will stop soon. For this, oil dose is 2 to 4 drachms and the tincture of opium is of 10 to 20 drops. The same procedure but in smaller dosage will prove advantageous in chronic dysentery. For this purpose, oil is given in 15 to 20 drops and the tincture of opium in 5 to 10 drops and in the form of an emulsion in water. Charaka advises that if the root of castor is cooked and given as a drink in dysentery, the accompaniment of blood along with the discharge will stop.

Besides as a purgative which is its major use, castor is employed for a few other medical purposes as well. Some of them are as follows:

In cases of piles a fomentation is done with a decoction of the leaves of castor, *Calotropis (madar)*, *bilva* and bamboo. Sushruta advises a fomentation with castor oil in cases of convulsions and fits.

Leaves are externally applied on painful joints. In cases of chronic disorders of *amavata* (constipation or torpor of bowels with flatulence and swellings) castor oil is a very influential medicine. It is given in the form of various specific recipes for this purpose. The roots of castor are also employed in many *vatic* diseases and in the diseases of the nervous system, in various forms. Caraka considers castor as one of the best drugs for virility and in destroying *vata* aggravations. He counts castor as one of the ingredients in his several famous groups of the ten drugs under the categories of those meant for massaging the limbs, to cause sweating and to regulate and remove obstructions. In old rheumatic inflammations, castor oil applied externally will remove the pain and lessen the hardness. There is one more name for castor, *vadari* (enemy to *vata*) signifying its efficacy for *vata* troubles. Bhavamishra opines that in curing such grave diseases as *amavata*, castor oil alone is sufficient. Even general literature in Sanskrit makes much mention of this oil in curing hip pains, *sciatica (gridhrasi)* - painful neuralgic

pain along the sciatic nerve down the thighs), paralysis and such other local manifestations of *amavata*. Boil the dehusked and ground seeds of castor in milk; the water of this milk is a very great medicine for pains at the loins and sciatica, as Bhavamishra emphasises. He further states that taking castor oil along with cow's urine for a month regularly at the mornings will be very beneficial in sciatic seizure. Taking this oil along with *harad* in the prescribed way would ward off *amavata*, sciatica and hemiplegia or partial facial paralysis. To reduce the glandular swellings and the breast pains of the ladies, leaves and seeds are ground, a poultice is made and then tied. Leaves are also effective this way but to a lesser extent. The juice of the leaves is used to clean wounds and injuries.

The castor root has a property of counteracting fever. Therefore a decoction is made from its milk and given as a drink. This decoction is particularly useful in giving relief to pains or sprains in the stomach.

Castor has some use in cough. The three pungents and castor leaves are advised to prevent cough. Yunani physicians have great many uses for castor oil: in paralysis, asthma, running nose, intestinal pains, flatulence, oedema and the absence of menstrual flow. Fresh juice is used in cases of poisoning by opium and other narcotic substances to induce immediate expulsion by vomiting.

Castor has an important topical value. For those who would like to slim down, the juice of the leaf is given as a drink along with *hing* and the supernatant rice water. Another method is to keep castor root soaked in honey overnight and the water is given to drink. The stoutness will reduce, the belly will not budge. If milk in which castor oil is added is taken daily for a month without any break, excessive fat will not develop at all. In *vatic* swellings and oedemas, castor oil is drunk with the water of cow's urine.

For any type of disturbance in the eye caused by the fall of a foreign matter for e.g. flints and steel particles and a rubbing thereby on the cornea, a drop of the oil on the eye (between the lower lid and the eye ball) will calm down the distress. In many diseases of the eye, leaves and roots are utilised in various ways. The oil may be dropped into the eye in conjunctivities and this is specifically beneficial in dissolving cocaine, bomatropine and other alkaloids used in eye troubles. It may be repeated often as a first aid until regular medical aid is obtained for the removal of the foreign body.

A decoction of the bark, the leaf and the root prepared in water and goat's milk is beneficial in the swellings of the eye. Seeds are applied along with barley flour in the form of a poultice in swellings of the eye.

Oil is used as an ear drop in deafness. This oil is much used in many skin diseases. In chronic skin diseases the root bark is given as a purgative as

well as a *rasayana* drug; it is also applied externally. In spots believed to be formed due to disorders of blood, castor oil is applied in Konkan areas. It is a common practice in South India specially to anoint the head with castor oil and then take an oil bath. This is presumed to be most cooling and particularly recommended in cases where heat has become an excess. It is equally well known that castor oil forms the base for many types of hair oil and pomades meant for the health and the luxurious growth of the hair.

Chinese medical men use the ground seeds and the oil together as an external application in many diseases. These are particularly useful in cases of scalded and burnt skins. Seeds are crushed and used as a massaging material over the temples in headache and the limbs in paralysis. The oil is utilised to open the urethral aperture in cases of obstructed urine. Crushed seeds are applied to hasten child birth and also in cases of operation for lithotomy or to expel the after-birth, and in peritonitis, dysentery and inflammatory diseases of urinary organs. The dose is about one teaspoonful for a child gradually increasing to two or three tablespoonfuls which is the full dose for an adult. This is best given floating on milk, strong hot coffee or in dry ginger water or omum water. In cases of painful affliction of the rectum, in piles and to prevent the patient straining at stool, the oil in small dose is greatly useful as this will soften the stools and lubricate the passage.

For sore nipples the oil is smeared fully, every time the child has its feed. For constipation, the oil serves as a useful enema; two ounces of it emulsified with a pint of soap suds and water is adequate to cause a copious evacuation of the bowels. To remove any sharp foreign bodies such as glass pieces in stomach giving a purge with castor oil is most suitable. In patients of *peenas* (maggots in the nose) castor oil is heated to concentration and sniffed through the afflicted nostrils.

One of the much praised use of castor oil is its efficacy in chronic rheumatism of the joints, for which this is used in several combinations. An important and compound medicated oil is prepared with 10 parts of castor oil, and a watery paste made up of *madar* (*Calotropis*) 5, the three myrobalans (*triphalā*) 5, tumeric 4, dry ginger 4 and *daru haldi* (*Berberis aristata*) 3 parts—all boiled together to a thick consistency and strained. This is a beneficial application to the abdomen in colic or twisting pains, to the back in lumbago and to the thigh in sciatica.

The root is a valued ingredient for many medications for nervous diseases and rheumatic afflictions such as lumbago, pleurodynia (pain in the sides) and sciatica. Sharangadhara recommends the giving of a decoction of the root along with impure carbonate of potash in pluerodnyia. Dried root is useful in fever.

Action: Castor oil is a non-irritant and a very comfortable purgative. Its mode of action in the body is well understood. When it reaches duodenum, it get decomposed by the pancreatic juice into ricinoleic acid which irritates bowles, stimulates the intestinal glands and the muscular coats thus causing purging. When given by mouth, this gets saponified and the free acid is liberated producing this effect. It shows its action in 4-5 hours causing liquid stools without pain or griping (i.e. contractive pains) usual in many purgatives and also has a sedative effect on the intestines. If glycerine is added, the effect of the oil is increased. Ricinoleic acid is absorbed into the blood and tissues and is excreted with milk which when sucked produces a purgative effect in the child. Ricinin is a violent irritant of the intestines, kidneys and bladder. It gives rise to inflammation of the bile duct and very often to jaundice and to dysuria. Ricin is a -powerful poison having a definite effect on the coagulation of blood. This has no purgative action; instead, it generates a bleeding inflammation of the stomach and the intestine even when given beneath the skin by an injection.

Root bark and leaves also have a purgative effect. Leaves are galactogouic i.e. they promote milk formation in the breasts. There is one more poisonous substance ricinin in the seed. Seeds counteract irritation and soothing.

Castor oil is a soft, non-irritating oil like the almond oil and the olive oil. It causes purging even

when rubbed on the skin or applied at the rectum. It is said to increase milk flow when applied over the chest but in this respect an application of a poultice of the leaves is more effective. An oral intake causes purging two to four times. Stools are mucilaginous or semiliquid but not watery. The oil will come out along with the last evacuation some times, causing sprain.

The quantity of ricinin, the poisonous substance, increases much when seeds start germinating. The two active component here are curcine (as found in *jamalgota* or *Jatropha Curcas*) and abrine (as found in *ratti* or *qunza*, *Abrus precatorius*). Seeds become poisonous, often fatal, because of this ricin. This clots up or coagulates blood. Even one seed may prove dangerous. The activities of ricin disappears in the hot temperature of the boiling water. The traditional method of roasting the seeds first to cause greater yield is quite likely to have kept this aspect also in view—that heat will destroy the poisonous aspect of the seed. Seeds that are roasted well can be eaten without any fear.

It is said that seeds are more effective than the oil. But a roasted seed causes an agitation in the stomach and the intestine and commences both vomiting and purging which soon takes up the form of a violent cholera attack.

Method of Intake

The dosage advisable for purging is minimum 30 drops of oil, and maximum 8 ounces for a young

adult. For an infant this should not be more than a small teaspoonful. Oil taken out in the old way is tasteless more or less and can be given like cod liver oil. The distasteful smell and the sliminess of the oil can be overcome by mixing it with the *babul* gum or gum arabic or the egg beat, or when given in the form of a capsule. It is helpful if oil is taken along with hot coffee or milk or if a cup of hot tea or water is taken after two hours following oil. One should preferably take this on an empty stomach, for, meals will obstruct or enfeeble the action of the oil. It is said that adding a few drops of turpentine will augment the purging action of the oil.

Home Remedies

Castor oil is a well known, ancient and traditional purgative material. Taken in accordance with age and in proper dosage, this is a safe, sure and healthy purgative, that will confer a great relief to the body.

Taking castor oil mixed with lime juice will eradicate distresses of stomach upsettings, and also vomiting and colicky pains of the stomach.

If there is a prickling sensation in the eyes, redness of the eye, or burning at the eye, pure castor oil mixed well with breast milk is a very effective application as an eye drop.

Apply castor oil all over the body, massage well and then take a bath in hot water. This will remove

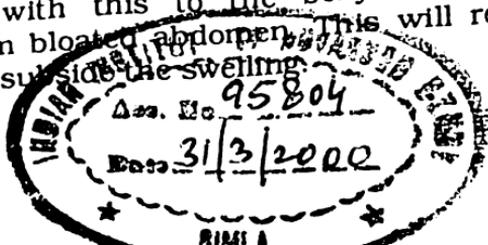
body ache, joint pains and will also confer a sound sleep and a relief from lassitude.

Taking a head bath once a week this way is a good practice. This is cooling to the eyes and much welcome to the body. It will render the skin soft and lustrous. One become lively all over.

Apply pure castor oil to the eyes before you go to sleep at night. Take a head bath in this way next day morning. Consume only liquid food and take ample rest. This will remove distresses such as burning at the eyes or pricking sensation of the eyes. Another method towards this effect as well as to stop the redness of the eye is to remove the outer shell of the castor seeds, take out white portion alone, grind this in breast milk and apply to the eyes for two to three days. All such distresses of the eye will disappear. Applying castor oil over the head will ensure freedom from dandruff and also a rich growth of the hairs.

Massaging the breasts after child birth and applying castor oil will augment stimulation of the milk glands and a greater milk production. Applying this oil to the teat daily and massaging outwards even before child birth will ensure ease in breast feeding.

Take betel leaf, apply castor oil all over it, warm this against a lighted lamp and then give a fomentation with this to the belly of a child suffering from bloated abdomen. This will remove the pain and subside the swelling.





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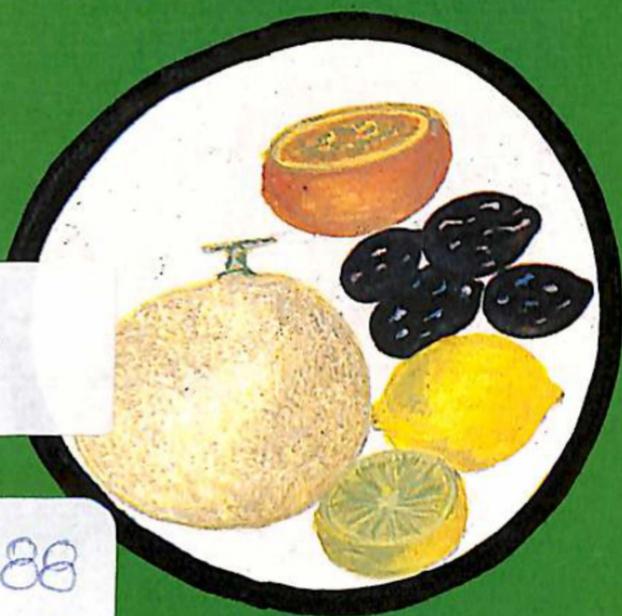
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