Health Series

Traditional Family Medicine

# Fruits

*Mango, Banana, Papaya, Grape, Guava Jamun*

HEALTH SERIES :
TRADITIONAL FAMILY MEDICINE

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## Mango, Banana, Papaya, Grape, Guava, Jamun

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BOOKS FOR ALL
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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

Fruits and tubers must have been among some of the early discoveries by the ancient nomadic man, the former mainly serving for delight and the latter, for his very sustenance, both however forming prized articles of food. Fruits are ever precious materials for man. It is interesting to learn that a great many of the edible fruits cultivated today had their origin in the same parts of Asia that had been the early centres of human civilisation. Cultivating vast fruit orchards and making many of his agro industries based on fruits are characteristics of modern exploitation of these cherished gifts of nature to man. There is probably no area now where there is no characteristic fruit of its own. Commercially as well as geographically the fruits can be divided into temperate fruits and tropical

fruits, each group having a great number of individual varieties within. Our vast country with its varied soils and climates sustains however a great many among both of these groups.

Fruits of temperate region are more an agreeable addition to the diet than a staple food. In the tropics however, fruits are the chief and may even be the only source of all sustaining food as in the case of banana, plantain, date, fig, coconut, bread fruit and jack fruit. Temperate fruits have only slight nutritive value. The water content is about 80 per cent, the rest is cellulose that has some roughage value (viz. forming enough undigestible bulk to stimulate normal activity of the muscles of the alimentary canal), a solution of various sugars, starches and pectin, and organic acids flavoured with volatile oils and aromatic ethers. Carbohydrates, specially the sugar is abundant, the amount and kind dependent on the degree of ripeness. There is a negligible amount of fats and proteins but organic acids occur more abundantly than in any other plant products; these are mainly malic, citric and tastaric acids. Pectin compounds are many and are important in promoting jelly formations under suitable conditions. Mineral salts also occur in considerable amounts.

The number of the edible tropical fruits is just countless, specially when one takes into account those that are used by forest dwellers, many of which are still unknown to the civilised world. One estimate indicates that in the rather restricted area

of the Philliphine Islands alone there are 250 edible fruits. Local variations among these fruits are also many. It has been also seen that sooner or later the temperate regions will have to turn to the tropical countries to supplement their indigenous food reserves and fruits are the best products that tropics can offer in this regard. Some tropical fruits have been well exploited thus, the best examples being mango, pine apple and banana in that order. Still however tropical fruits have been rather neglected horticulturally and this holds true to India also. It is necessary that our entrepreneurs should look into this aspect of improving our very many 'minor' fruits by modern scientific processes. That is why along with our major fruits, some idea of these minor gifts is also attempted to be given below. Seedless pomegranates and the Allahabad variety of *guava* or *amrud* are good examples of how modern horticulture can turn them into major assets of the nation. Indian gooseberry or *amalak* (*Emblica myrobalans*) - a veritable mine of vitamins is the best example of a fruit on which Indian expertise can try its hand now with great promise. Tropical fruits in general are nutritious as well as rich in vitamins and organic salts.

Since fruits are perishable and have poor keeping qualities many ways of perserving them have been devised, technically perfected and these form the flourishing modern industries of fruit juices and canning. They are: drying, salting, smoking; sweetening with sugar, honey and spices; preserving in alcohol or other chemicals; pickling in

salt or vinegar; packing in fats; sterilisation; canning; and, freezing. The three chief methods however are: drying, canning and freezing in the advanced industrial West; pickling and preserving in sugars as *morabbas* etc. with us. Drying is the easiest and very favourite; this can be done under sun or hot air; for, bacteria do not develop if the water content is below 20 per cent. Canning is always important and is *the* method for commercial scale operations. Strong solution of sugar, honey or glucose will keep off bacterial decomposition. Hence, large quantities of fruits are preserved as jams, marmalades and candied fruits. But the quick freezing or what is called cold pack method is very effective. Here the fruit is placed in small containers and the heat is extracted rapidly from both the top and the bottom of the container, resulting in the formation of smaller ice crystals as the material freezes. The final product would thus have a better quality, colour, flavour and vitamin content. Quick freezing is quite practicable for both home and commercial scale. Still however improved cold storage methods and greater transport facilities of modern times have made the use of fresh fruit itself possible to a very great extent and in many parts of the world. Fresh fruit production is now almost an industry and the choice alphonso mangoes of Bombay are quite quickly available in Russia and the United States of America. Still, modern entreprenuers can appreciate the immense possibility of the future by the following statement: "of the thousands and thousands of edible fruits

only about 100 are now cultivated and of these, not even 50 per cent reach the market of the Developed countries".

What is a fruit and how do we classify it? Strictly speaking all flowering plants invariably produce a fruit which represents its ovary after fertilisation of the ovule within, the former becoming the fruit wall or the pericarp, and the latter a seed, the two together constituting a fruit. Usually it is only the ovary that undergoes marked changes following fertilisation and goes to form the fruit' wall. Occasionally however other parts of the flower, for example, the thalamus in which the ovary is embedded as in apples, or the sepals or the calyx below the petals become fleshy and edible, as in *Hibiscus sabdariffa* (*patwa* in Hindi) or the stalk of the flower becomes the prominently fleshy, colourful and the edible portion, as in cashewnut apple. These are all called *false fruits*.

In most cases, a single or one united ovary is involved in the formation of a fruit. These are called *simple fruits* as in mango, beans and many others. Occasionally the ovary of a single flower is not a single structure but consists of many individually separate units. On fertilisation and the consequent maturation all of them become united into a single fleshy whole in which however the individuality of the component members are somewhat still demarcatable. This is what happens in *Anona squamosa* or *sitaphala*. This is called an *aggregate fruit*. Occasionally however separate ovaries of

numerous flowers of a whole inflorescence or the flower cluster become united into a single mass following fertilisation. This constitutes a *compound fruit*. The best example is the jackfruit.

Fruit may be *dry* or *fleshy*; the former may further be *dehiscent* (i.e. breaking open at maturity to release the seeds within as in cotton) or *non dehiscent* (i.e. not breaking at all, is in the nuts eg. cashewnut). All fruits contain edible matter in the wall, the seeds etc. and are therefore foods for man, or beasts or birds. Grains i.e. cereals like rice, ragi, pulses like gram, ground nuts, berries like brinjals and tomatoes are all edible fruits, botanically which are however called vegetables, as popular conception does not consider them to be so. According to these only those fruits that are usually eaten without being cooked constitute fruits. It is in this sense that the fruits are discussed here.

We first enumerate some major temperate fruits by their common English, technical and Hindi names. It should be noted that these are all actively being cultivated in India and some also have names in regional languages, an index of their familiarity. The first place here goes to apple (*Pyrus malus, safar chand*) a native of Eastern Europe and West Asia but abundantly cultivated in India now. Others are pear (*Pyrus communis, nashpati* in Hindi), quince (*P. cydonia; bedana*), apricot (*Prunus armeniaca; jardalu, khubani*), almond (*P. amygdalus; badam*), peach (*P. Persica*, a native of China but grown in some Indian Hill States, *aru* in

Hindi), plum (*Prunus domestica, alu, alucha, shanalu* found in Iran, Afghanistan and Kashmir; there are a few Indian species here *P. insititia* known in Indian bazaars as *alu-Bokhara; P. mahaleb, pryangu* in Sanskrit; *P. sylvatica, padmaka* in Sanskrit and *Padam* in Hindi; *P. padus* Bird cherry in English or *jamana* in Hindi, of Sikkim-Bhutan and an yielder of poisonous but medicative oil), cherry (*Prunus seratonia*, a native of Europe but available in India, black berry); *Rubus lasciocarpus*, an American fruit but well cultivated here for e.g. at Mahabaleshwar near Pune called *gauriphal* in Marathi); black cherry (*R. moluccanus* common in Kumaon, Nepal, Sikkim known there as *bipem kanta, kalsol, katson; sufokji* - a lepcha term; eastern India and Western Ghats); raspberry (R. *wallichii*); straw berry (*Fragaria verca* cultivated in Mahabaleshwar near Pune). All of these famous fruits come from one family Rosaceae to which the roses belong. But there are other temperate fruits: melons (watermelons, discussed in a separate book in this series), grapes, a native of Caspian sea region but well grown in India now, currants (*Ribes nigrum; nabar* in Punjabi); and gooseberries (*R. grossularia; amlanch* in Punjabi, *vaikunti* in Kumaon; both currants and gooseberries are found in the mountainous and temperate regions in Western India); there are two more species *R. orientale, gwaldakh* in Hindi, *nayiphulanch* in Punjabi and red currants or *R. rubrum, dal* in Punjabi) and mulberry (*Morus alba; tut* in Hindi).

Some major tropical fruits are the following: the famous citrus fruits (eg. lemons, limes etc.) - natives of Easter Asia and Southern Asia; banana, a native of the humid tropics of India and Malaysia; date (*Phoenix dactylifera, khajur*, a native of India/ Arabia); fig (which originated in Southern Arabia); mango, whose original home is undoubtedly India, the most important and the oldest of the tropical fruits; tamarind, another native of India, very popular and highly employed in cooking; guava, a tropical fruit of the Incas and papaya, both being the natives of South America but abundantly cultivated in India; litchi, a native of Vietnam and Thailand but extensively cultivated in Northern India; *jujub*, a Chinese plant, popular all over India; loquat, another Chinese gift, called *takta* in Tamil, *lakkote* fruit in Kannada, popular in the Nilgiris of South India; pine apple, a South American native but extensively cultivated in many parts of India; sapota of the Tropical America, nativised well all over India; pomegranate, an Indian introduction; the great jack fruit and the bread fruit, the former being a native of India; and, so on. These are just a few major fruits. Minor fruits of India are just legion.

The fruits discussed below however are just the following: mango, banana, papaya, grape, guava and jamun-among the major category. Custard apple, jujube and pomegranate are the common Indian fruits coming under the minor category.

Most of these fruit plants are also of considerable medicinal value as well, apart from their principal use as delicious fruits. This aspect will also be highlighted in the account presented below.

Fruits are protective foods invaluable for our nutrition as they are precious and easy sources of vitamins and minerals; their speciality among the foods being that they can be eaten raw, fresh and without any processing.

Among the vitamins, most fruits contain significant amounts of ascorbic acid. Orange, guava and *amalak* are particularly rich in this. One medium sized orange is adequate for the daily requirement of ascorbic acid for an adult. Apart from this acid several fruits contain a good deal of carotene. Papaya and mango are its excellent source. Among the minerals, fruits are particularly good for sodium and potassium. Some fruits like custard apple or *sitaphal* are rich in calcium. Dried fruits like raisins (dried grapes), dates and apricots have a rich percentage of calcium and iron. Fruits also have a great many variety of organic acids that are responsible for the sourness of the unripe fruits. It is a miracle of the maturation chemistry of fruit that this often intolerable sourness becomes delectably sweet in a ripe fruit. An intake of fruits leads to the formation of alkaline urine in the body. In general, fruits have a low energy value and they do not therefore serve as staple foods. Some however are exceptions like banana and mango as they have good amounts of carbohydrates and do

act as commendable sources of energy. Pectin, the cementing material and a kind of sugar richly present in fruits like guava is useful in preparation of fruit jellies. Fruits, specially the ripe ones, are particularly rich in characteristic sugars; these latter are easily digestible and completely absorbed—a very valuable aspect of fruit as a food. The more ripe a fruit, greater is its sugar content. Fruits are also rich in undigestible cellulose which is particularly valuable in nutrition as this gives a great roughage value of assisting in bowel movements.

Nutritionists recommend a daily intake of 85 grams or more of fresh fruit to maintain good health. Fruits are however costly and are thus out of reach for many. Green leafy vegetables are no doubt their good substitutes; if they are taken, need for fruit consumption will be much less. But it is very important to note that an intake of many seasonal fruits that are available easily and also cheap is also very valuable. It is one among the many food fads that only the costly and out of the season and preferably the rare fruits that are the most valuable. It is not at all necessary that every one should eat only apple, fresh fig and almond. The costly fruits are not necessarily the most commendable, nutritionally. It becomes a duty among the health workers to educate people regarding the precious nature of the many ordinary and cheap fruits.

The food value of a few common fruits is given below.

| | *Protein* | *Fats* | *Carbo-hydrates* | *Mineral salts* | *Vit. A* | *Caloric value* |
|---|---|---|---|---|---|---|
| Banana | 1.3 | 0.2 | 36.4 | 0.7 | 124.6 | 150 |
| Papaya | 0.5 | 0.2 | 9.5 | 0.4 | 1,110.57 | 40 |
| Mango | 0.6 | 0.1 | 11.8 | 0.3 | 4,800.13 | 50 |
| Guava | 1.5 | 0.2 | 14.5 | 0.8 | 0.212 | 66 |
| Orange | 0.9 | 0.3 | 10.6 | 0.4 | 326.68 | 49 |
| Grapes | 1.0 | 0.1 | 10.0 | 0.4 | 0.1 | 45 |
| Raisins | 2.0 | 0.2 | 77.3 | 2.0 | 0.0 | 319 |
| Sitaphal | | | | | 0.16 | 114 |
| Amalak | | | | | 15.600 | 58 |
| Dates | 3.0 | 0.2 | 67.3 | 1.3 | 44.3 | 283 |
| Litchi | 2.8 | 0.23 | 6.3 | 1.1 | | 22 |
| Pine apple | 0.6 | 0.1 | 12.0 | 0.5 | | 50 |
| Pomegr-anate | 1.6 | 10. | 14.6 | 0.7 | | 65 |
| Apple | 0.3 | 0.1 | 13.4 | 0.3 | | 56 |

Calcium and iron contents in miligram of some of these fruits are as follows: banana 10, 05; grapes

20, 1.5; guava 10, 1.4; mango 10, 0.3; orange 50, 0.1; papaya 17, 0.5; *sitaphal* 398, 0.3; *amalak* 50, 1.2; dates 120, 7.3; raisins 100, 4.0.

Fruits like vegetables also constitute an important source of spreading disease-causing organisms, as they are rich foods. They should be well cleaned before use and ill preserved fruits as well as cut fruits kept open in the bazaars should better be avoided.

## A. MANGO

Mango is the king of fruits and undoubtedly accepted as a native of India, where there is also a record of its being cultivated for nearly 6,000 years. During this long period and the loving care as well as the expertise of horticultural practices, innumerable varieties of mango have been produced. Infact, it is not an exaggeration if one states that almost every region of our country has its own preferential choice variety which it often claims as the best. And mango is one of the few tropical plants that have been improved under cultivation. There are now more than five hundred horticultural varieties. These varieties differ in the size, the shape, the colour, the flavours, the aroma, the taste, the fibre content, the texture of the flesh, the keeping quality and so on of the fruit and also the branching habit, the net yield, the colour shade of the young leaves and so on, of the tree.

Though it is a native of India, the tree is cultivated now widely in Malaysia, Polynesia, Africa,

Tropical America and in the States of Calilfornia and Florida in the USA.

Mangoes in the tropics are comparable in their importance to apples of the temperate regions. Actually this importance is much more; for, as it is often pointed out, mango is the one fruit that can be eaten with relish at any stage and they are actually estimated to furnish food for atelast one-fifth of the World's population. Ninety Nine per cent of them are eaten fresh. But they are also used as preserves, pickles, salads, sauces, chutneys, *murabbas*, syrups, juices and so on. They are also cooked; dried, canned and very profitably exported outside, fresh and/or preserved. They always have a ready market.

Among all the fruits, mango is the most strengthening and nutritious. It is liked by one and all and is beneficial to the healthy persons as well as the patients. It augments the production of blood and is of great value in constipation. It has a considerably large amount of Vitmin A and its Vitamin C percentage is the greatest.

Emperors and poets have lavished their praise on the all round excellence of the mango fruit. Emperor Akbar had maintained a Lakh Bagh in Darbhanga - a garden of one thousand plants. No historical incidence regarding the extensiveness of the mango orchards can be more telling than the fact that a whole Army had taken shelter in one such orchard in the momentous battle of Plassey near Calcutta that tilted the soverignity of India to the British.

Mango has always attracted admiration at the hands of the foreigners. A well known author by name Fryes wrote thus on mango in 1673 A.D. "The Apples of the Hespirides are but fables to them for taste and the Nectarine, Peach and Apricot (the other choice fruits of this country) fall (far) short". Another famous writer Hamilton declared in 1727 A.D. that "the Goa mango is reckoned the largest and the most delicious to the taste of any in the World and I may add the wholesomest and the best tasted of any fruit in the world". The celebrated Urdu poet of India, Mirza Ghalib has written a full size poem expatiating upon the numerous virtues of this all beneficient fruit. Sanskrit poets never tire of praising the fragrance of the mango sprouts, the cool shade of the tree and the unsurpassed delicacy of its taste.

**Names**

Sanskrit has many names for mango: *amra, phala shreshta* (preeminent among the fruit), *kama vallabha* (beloved to the lovers), *chuta, vasanta dru* (the spring tree) and so on.

In term of the names there is simply no doubt as to the Indian nativity of the plant. The regional names in all languages of the North are traceable to the Sanskrit term *amra*. Languages of the South have their base in its Tamil name *manga*. The English, the European and the botanical names of the plant are all related to this Tamil term, which the Portugese from Goa had first borrowed.

This is known as *amba*, *naghzak* in Persian; *ambaj* in Arabic; *am* in Hindi, Bengali; *ambo* in Gujarati; *amba* in Marathi; *amb* in Sindhi; *manga*, *mambalam* in Tamil and Malay; *mamidi* in Telugu; *mavu* in Kannada and Malayalam.

It is mango in English, manguier in French; mango baum in German.

**Botanical Aspects**

Botanically mango is called *Mangifera indica* Linn and belongs to a family of trees called Anacardiaceae. There are quite a few other famous plants coming under this family. They are: cashewnut (*Anacardium occidentale L)*, pistachio- the famous pista in Hindi (*Pistachio vera)*, the well known ayurvedic plant *karkatashringi* (*Rhus succedanea L.f)* and the Indian Hogplum (*Spondias acuminata Roxb.*)

Mango is a beautiful, evergreen, spreading, shady and large tree growing to 50 to 90 feet in height and bearing numerous, small, pinkish-fragrant flowers in large panicles that are produced in great abundance heralding the spring. The wild varieties generally grow vertically upwards while the grafted and the choice varieties are characterised by thin low branching and more of a horizontal rather than vertical spreading.

All parts of the plant are smooth and non-hairy excepting the inflorescence. Leaves are crowded at the ends of the branches and leathery. They are

simple, alternate, 5-10 by 1;1/2-3 inches, oblong or mostly oblong lanceolate (like a little lance) in shape and shining. Tip is mostly acute, sometimes a little drawn out. The margin is entire, often wavy. Base is narrowed. Flowers are small with somewhat disagreeable smell and clustered in large, many flowered, hairy and much branched panicles. Drupes are large, fleshy with a well known mango shape. Stone is compressed, fibrous and very hard.

This is well known and cultivated in India in profusion and in the whole of the Tropics generally. It is a native of India and said to be wild in the Western Peninsula from Khandesh in Maharashtra and Southwards.

Almost all parts of the plant such as the gum, the bark, the leaves, the flowers, the fruit and the seed inside are useful in some way or the other.

**Nutritive and Medicinal Uses**

***Constituents:*** Dried unripe and peeled fruit contains 21 per cent water, watery extract 61.5 per cent, cellulose 5 per cent, insoluble ash 1.5 per cent, and soluble ash 1.9 per cent, which in turn consists of potash as well as free tartaric, citric and malic acids. Ripe fruit contains yellow colouring matters, a chlorophyll product soluble in ether, bisulphide of carbon, benzol and just a trace of gallic acid with citric acid and gum. Bark is appreciably rich in tannin. The seed within the stone contains gallic acid and tannin, fat, sugar,

gum, ash and a large amount of starch. This seed is perfectly edible and in fact quite nutritious. In the days of *The Harijan* which he was editing, Mahatma Gandhi has been strongly advocating the use of this seed as food by general public. Unfortunately as with many others of his advices this also went almost unheeded. Even now this valuable kernel is just discarded and thrown out - a huge valuable waste! Pulp of the ripe fruit has a trace of gallic acid with ctiric acid and gum. Gum of tree contains 71 per cent of sugar apart from moisture and ash, the sugars are of galactose and pentose variety. Mango flesh is a good source of vitamins, particularly Vitamin C that is so specific a cure for scurvy disease.

***Action in general, within the body:*** The fruit of mango is laxative, diuretic (i.e. promotes profuse urination), diaphoretic (i.e. sweat provoking), astringent (i.e. contractive to living tissues and hence healing) and cooling and refreshing. The fully ripe fruit is slightly laxative and diruetic but highly nourishing and invigorating. Unripe fruit is acidic, astringent but good for the stomach and is also an antiscurvey drug or . antiscorbutic. Bark is astringent and a good tonic used in the form of a decoction. The gum resin exuding from the bark is bitter and astringent. The seed kernel is starchy, astringent in taste and action and also inimical to helminth worms. *Amchur* or the dried preserved pieces of raw, unripe mango are so very valuable as an antiscorbutic drug that it had been very popular among the Indian armymen.

**Use of Mango**

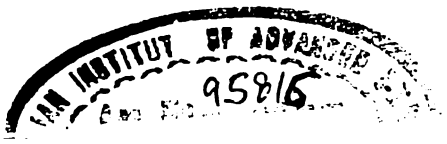
The way in which mango is being used as food in India are just legion. From the fruits are prepared *sherbets*, custards, preserves, curries, jams, chutneys, *amchur* (from the unripe fruits) and so on. Only the juice is extracted from the fruit and these form the base of mango juice, mango milk shake, mango mix and so on. In Konkan and Maharashtra and some places in the North, the juice of ripe mangoes is spread about on an oil or ghee besmeared plate and dried in the sun. Over such a dried cake, another layer of the fresh juice is spread and dried along with the previous one. In this way a dry flat cake of several layers in thickness is made. This can be stored for a long time and chewed as a relish or an appetiser and as the occassion demands. This is the famous *ampoli* or *sathe* of Maharashtra.

Medicinal preparations of mango are also many. They are fluid extracts and infusion of the bark, powder and decoction of the flowers and leaves, decoction and dried powder of the seed kernel, fumigation of the burning leaves that give a characteristic mango like acrid smell, ashes of the mid ribs of the leaves and the sweet, acrid and astringent gum exuding from the bark. Almost every part of the plant has some medicinal use or the other.

However, it is as a fruit that mango is most praised for its excellence and deliciousness.

**Fruit**

Ripe fruit is very wholesome, nourishing and completely satisfying. It is also useful in nervous upsets and a tonic (where the muscular tone of the alimentary canal is upset) and in dyspepsia or indigestion and also in constipation. A confection is prepared from the juice of the ripe fruit adding sugar and extra aromatic substances. This is a nice restorative tonic specially for the debilitated. Another type of confection is made out of the baked pulp of the unripe fruit mixing it with sugar. This is taken internally in times of the epidemics of cholera and plague. This is also rubbed then all over the body as a prophylactic or a preventive measure. A fluid extract either from the fruit pulp or the rind alone is taken out; this is a beneficial and astringent tonic to mucous membranes of the body. Its effects are very commendable in cases of grave throat afflictions like diptheria. Locally, this constitues a useful external application to prevent or check haemorrage or bleeding. A green unripe fruit is taken, the stone is removed, the flesh is cut into desirable sizes. These are put into curries or *sambars* or gravies and so on to yield many delicacies of the season. They are also made into pickles of numerous varieties depending upon the *masalas* and the mode of preparation; the ingredients are salt, sweet oil, chillies, fenugreek, turmeric and so on. *Moramba* or *gulamba* is a jam like preserve made by boiling and cooking the mango in syrup. It is also dried into *amboshi* used as a stored source of acidity to certain types of



curries. Small sized whole fruits are salted and pickled for a choice type of pickles called *mamidi*. *Young unripe fruits* are cut into small pieces mixed with salt and chillies or ground well with the latter two and then seasoned to yield very popular Indian chutneys. Mangoes that are almost nearly ripe are used to make a curry that has a very welcome sweet and acid taste. *Unripe fruits* are very much used in India in conserves, and tasty chutneys. *Juice of the unripe fruit* is applied to cracks in the sole or heel of the feet caused by cold; they will heal well. In Konkan and South Canara, fresh juice of the unripe fruit is extracted by fully squeezing its gratings; this is then sweetened with sugar, some cumin seeds are ground and mixed with it. This is a very refreshing mango juice for the hot days of summer. *Rind of unripe fruit* is cut into pieces, fried in ghee, mixed with sugar and the whole stuff is made into a pill mass. Several pills are made out later and these are given in stipulated doses in case of menorrhagia or excessive menstrual flow. Rind is ground with milk, a little amount of honey is added; this is given in bleeding dysentery. Take $2^{1}/_{2}$ *tolas* of the rind of an unripe mango, rub this into an emulsion with curds. This is a remedy for cholera morbus.

**Kernel of the Seed**

This is powdered and given in doses of 20 to 30 grains with or without honey in many afflictions: asthma, diarrhoea, chronic dysentery, blood vomiting, excess menstrual flow, bleeding piles, round worms and so on. In mucous dysentery this

kernel ground down with curds forms a good remedy. For dysentery in pregnant women the kernel is fried in ghee and given for eating. To stop nasal bleeding juice of the kernel is sniffed deeply. Sharangadhara, a reputed author on ayurved of the medieval times recommends a decoction of this kernel - all by itself or along with that of wood apple and ginger, for diarrhoea; this is given in dose of 1 to $^1/_2$ drachms. In case of chronic dysentery the kernel in combination with a little opium and some stimulant aromatic drug, proves very useful.

Kernel of the seed is actually used sometimes as food among the poor.

*Amchur or ambose* is a very popular article of diet in India. This is made of green mangoes that are skinned, destoned, cut into small pieces and dried in the sun. It is so richly acidic (because of citric acid) that half an ounce of it is equivalent to one ounce of good lime juice. That is why it proves so useful as a remedy for scurvy.

**Bark**

Fluid extraction of the bark or an infusion of the bark is curative in excessive menstrual flow, white discharge, bleeding piles and in cases of bleeding at the lungs and also in nasal discharge. A compound preparation or a yoga is made as follows. This is a cold infusion (1 part of the drug material in 8 parts of water) of the powdered barks of mango, jamun and *arjuna* tree (*Terminalia arjuna*), all taken in equal parts. This is prescribed to stop all internal

bleedings. A decoction is also prepared of these ingredients alone for the same purpose. This is given in doses of 1 to $1^1/_2$ drachms and mixed with *conjee* or rice gruel water. Or, the juice of the fresh bark alone is administered with the white of the egg and a little opium, which is the pain killer that is particularly useful if there is griping. Take 4 *tolas* of the juice of the bark, mix it with 1 *tola* of lime water and give this for seven days. This is a sovereign remedy for patients of acute gonorrhoea. In cases of bleeding internally at the lungs, the uterus or the intestine, prepare a fluid extract of the bark (1 part drug in 12 parts of water). Mix it with 2 ounces of water and administer in doses of one teaspoonful every hour or two. This proves very useful.

Another compound preparation is as follows: Make a decoction (1 in 20 parts) of the barks of mango, *Jamun* and *Spondias mangifera*. Reboil it with an addition of rice (in 20 of the decoction) to form an emulsion. This is given daily to cure chronic dysentery.

**Leaf**

The fresh juice has a strong astringent action and is therefore useful in bleeding dysentery. For this purpose, a mixture of 2 *tolas* of the juice, one *tolas* each of honey and milk, and 2 *tolas* of ghee is a useful remedy.

The milky fluid obtained from the leaf or the bark is usefully applied to heal the cracks of the foot and at the hands.

A decoction of the leaves with a little honey is given in cases of loss of voice.

Midribs of the leaves are calcined (i.e. turned into ash by red-hot coals). This is used to remove warts on the eye lids.

Tender leaves are dried and powdered. This is said to be useful in diabetes.

Smoke of the burning leaves cures hiccup and throat affections.

Ashes of the leaves is a popular remedy for burn and scald injuries.

**Flowers**

Fresh flowers are ground and prepared into a delectable aromatic chutney, with chilly and other *masalas*.

A decoction of the dried flowers is useful in diarrhoea, chronic dysentery and gleet (a slimy discharge from the mucous layers).

Powder of the dried flowers is used for fumigations against mosquitoes.

**Gum**

A good use of this gum is in healing the cracks at feet and the like. Gum resin from the bark is used in running nose etc and mixed with lime juice. It is applied to scabies and other skin affections.

**Ayurveda and Mango**

Some uses of the different parts of the mango tree were mentioned above. Ayurveda goes into considerable detail as regards their properties, action and medicinal uses. The following account is concerned with this and specifies them under the different parts.

The unripe fruit is astringent, sour, appetising and condusive to augment *vata* and *pitta* vitiations. This constricts the intestines (and hence heals injuries there) and wards off the distresses of the throat. It is beneficial in dysentery, urinary affliction and uterine dysfunction. The *amchur* of the unripe fruit is sweet, astringent and removes *kapha* and *vata*.

The ripe fruit is sweet, unctuous, promotive of virility, highly satisfying and heavy. It destroys *vata*, improves complexion and cools and refreshes. It wards off urinary disorder of *prameha*, wounds, phlegm and the diseases of blood.

The flowers are cooling, causative of *vata*, constipative, cold, appetising and aromatic. It destroys *kapha* and *vata* aggravations.

The tender leaves are astringent, constipative and appetising. It removes the aggravation of all the three *doshas*.

The 'stone' of the mango is sweet and somewhat astringent. It wards off vomiting, dysentery and pains near about the heart.

The seed yields an oil which is astringent, tasty, dry in quality and bitter in taste. It rectifies diseases of the mouth and the aggravation of *kapha* and *vata*.

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The flowers are cooling, causative of *vata*, constipative, stimulative of digestion and appetising. They destroy biliousness or *pitta*, *prameha* and *kapha* vitiation.

The root is astringent, constipative, cold, appetising and aromatic. It destroys *kapha* and *vata* aggravations.

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**Mango Juice as a Medicine**

Many famous physicians in Gujarat have kept patients of various grave diseases such as

consumption, intestinal malabsorption (*samgrahani*), blood disorders and seminal weakness only on a diet of mango juice and milk and achieved great success. They consider that a ripe fruit of a good variety of mango probably contains all factors that are needed for a good nourishment of the body. In its sweet juice both the vitamins A and C occur in large amounts. Vitamin A acts prophylactically protecting the body from outside harmful organisms and their toxoids. Vitamin C destroys affliction of the skin. This juice of the ripe fruit is considered to be the most nourishing and the most strengthening of the foods. If this is taken along with milk both the qualities are difinitely augmented. There are many diseases where the patients are kept only on a milk diet which is not amenable to many, who will have therefore to give up such medications. If on the contrary they are given mango juice along with milk the latter becomes not only acceptable but definitely more welcome and highly salutary. A combined use is always more profitable. Mango juice is also slightly laxative. Therefore for all those who have a constipative tendency, the juice is a wholesome diet. This also confers great benefits in cases of sprue (intestinal malabsorption or *samgrahani*), breathing difficulties, tastelessness, *amla pitta*, intestinal diseases and liver enlargement. In consumptive patients it becomes very useful in augmenting their blood, flesh, virility and strength.

The correct medicative way of using mango juice is as follows:

When this regimen starts no food other than mango juice and milk are to be given. Cow's milk is the most excellent here. If however, it is intended to be used for a consumptive patient, employ goat's milk, which is better. Milk drawn just then from the cow and udder hot (*dharoshna*) is the best. If this is not possible, the ordinary milk is to be boiled, cooled, sweetened and then used. Good quality of mangoes should be used; never use sour or over ripe fruits. Before using the fruits dip them for sometime in cold water to remove their heat. Wash and clean them, remove the stalk, discard a little amount of the juice near it and then the patient should suck the mango slowly. This is preferable to taking the juice first extracted and then taken. Contamination risk is absent then. If during taking the juice, any trouble of *vata* or *kapha* is noticed, eating a bit of fresh ginger with a pinch of *saindhav* salt will do. Ordinarily, taking the fruits once a day to the heart's content and milk another time in the day would be enough. If digestion permits, there can be a 2 times of such an intake, first milk and then the juice.

A regimen like this for a month or two would cleanse the digestive system thoroughly and complaints of chronic consumption, feeble digestion, heart diseases, consumption and asthma would be largely mitigated. A new life enters in, blood increases, strength gets augmented and the very lustre becomes glowing.

Take a stoneware or porcelain vessel, place 15 to 20 *tolas* of the juice of well ripe good quality

**Yunani Opinion**

Ripe mango is strengthening, satisfying, promotive of blood, fattening, softening to the viscera and is also aphrodisiac. The seed kernel is astringent and stimulative. The bark is contractive; it stops bleeding and cures dysentery and vomiting tendency. The tender leaves are beneficial in piles. Fumigation with its leaves cures whooping cough. Flowers destroy phlegmatic complaints and augments blood. Fruit is aromatic, soft, very tasty and nourishing. It is beneficial to liver and spleen. It removes foul smell of the mouth and cleanses the brain. It removes lassitude, takes away burning sensation in the body and improves the beauty. It is beneficial in phlegmatic complaints, piles and liver troubles. Seed kernel is contractive, useful in chronic dysentery; it is cooling and aphrodisiac also.

Half ripe mangoes made into *morabbas* (sugar preserves) are equal to fully ripe mangoes in the benefits they confer. Raw unripe mango is very good at warding off vitiation due to bad air. Its cut pieces are drowned in water and that water is drunk when acidity has entered in it, sweetening it with sugar candy. Or, an unripe fruit is baked in hot roasted sand. It is then taken out, cleaned, squeezed and to this are added distillation (*arka*) of bamboo flower and pandanus flowers and sugar candy as required. This is given with best results to patients of poisoning. Raw mangoes are not wholesome to teeth. The seed kernel is used to strengthen stomach, and stop excess urination and dysentery.

mangoes in it, add 5 *tolas* of good quality honey. This is to be taken in the morning. The same amount of this mixture is to be taken again in the evening. In addition, udder hot milk of cow or better goat is to be taken 2-3 times in between. As far as possible no water is to be drunk and no other food is also to be consumed. If water is indispensable as little of it as possible is to be taken and that too, mixed with fresh ginger juice.

A regimen of this nature for a month or two would ward off chronic indigestion, drying up or dessication of the body, and chronic cough. Strength, virility, blood, flesh and lustre - all of these will get augmented.

In cases of intestinal malabsorption and stomach diseases the procedure is as follows. Take two good quality ripe mangoes in the morning, pare away the skin, cut into pieces, place them in a porcelain vessel and pour on them boiled and cooled milk till they completely drown in it. After sometime take out these pieces with a spoon and chew them well and eat. Afterwards drink the remaining milk. Keep taking a *pav* of milk at 2 hours interval following this. In this way do not take any food other than milk and mango. When the number of the times of passing stools gets reduced gradually, mango and milk may be taken in the afternoon also.

Such a regimen continued for 3-4 weeks would bring even terrible states of malabsorption under control. At least a month's regimen is a must.

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Raw mango cures scurvy while the ripe one is an elixir, nourishing, satisfying and slightly laxative. Skin prevents uterine and nasal bleeding and bleeding dysentery.

**Modern Opinion and Others**

The bark of the tree is an excellent preventer of bleeding. The juice of a ripe fruit is nourishing and palliative of disorders of biliousness and blood. To prevent haemorrhage internally in the intestines or the uterus, a decoction of the skin is advised. The seed kernel is given in a dose of 10-15 *rattis* in case of bleeding piles and excessive menstrual flow. A *panak* or sweetened juice of raw fruit is given beneficially when there is an attack of heatwave (*lu*). The juice of the skin becomes useful in days of summer heat.

In some areas of west Africa the inner bark of the tree is given in cases of piles.

In Madagascar the skin of the fruit is considered contractive and the fruit is regarded as warding off fever.

The seed is also regarded as contractive and germicidal. Its distillation is given in America to strengthen mucilaginous membranes. It is beneficial in diptheria and other throat diseases.

**As a Household Remedy**

Small sized raw mangoes are mines of Vitamin C. Eating them raw as such or in the form of pickles

and chutney is excellent. It is not preferable to boil mangoes and consume. Eating one raw mango a day in the season when it is available will improve blood circulation, set right the nervous debility, rectifies anaemia and augments memory power. Regular use of raw mangoes will confer a power of resistance in such diseases like anaemia, consumption, insanity, cholera and diarrhoea. Eating raw mango with salt is a good practice to quench thirst, remove the feeling of tiredness and fatigue and this will also confer an ability to tolerate the heat of summer.

Eating raw mango daily along with black pepper grains and honey will ensure a heightened activity of liver and a rich secretion of the bile fluid. This will avoid the possibility of jaundice and a rotting of food within the stomach for a lack of insufficient digestion. One can consume pieces of raw mango dried in sun during the seasons when mango is not available in the market. This constitutes *amchur*, which many prefer instead of tamarind, specially when the latter does not suit their constitution.

Eating a few very much unripe small sized raw mangoes along with honey proves beneficial for patients of dysentery, diarrhoea, constipation, jaundice and piles.

But it is unhealthy and inadvisable to eat an excess amount of raw mangoes. And, one should not drink water immediately after eating a mango.

Pickles are best prepared from raw mangoes that are well developed. These pickles add a relish to the meals, promote hunger well, ensure good digestion and will prevent rotting of food within the stomach.

A simple cure for excessive menstrual flow is to take in a fistful of the gratings of the skin of raw mango well roasted. Another use of this skin of the raw mango is to grind its gratings into a smooth paste, take a tea spoonful of this, mix it with a cupful of buttermilk and drink. This is a cure for the disease of piles that come about due to excess of heat in the body, dysentery and diarrhoea.

Break the stalk of the raw mango and you will get a sticky fluid. This fluid is to be dripped directly and applied on to old skin diseases such as scabies and ringworm. Many other skin diseases also respond well to this treatment.

The fruit of mango is one of the most satisfying and highly relishable fruit. Eating it after the meals is good as it contains a commendable digestive capacity. The fruits that ripen on the tree itself are the tastiest, the most nutritious as well as very healthy. Eating mango fruit promotes hunger, augments efficient digestion, quenches thirst, prevents constipation and makes one lively and physically energetic and refreshed. But one should consume the fruit only after washing it well in the water and avoid eating it if it has black spots or it is over ripe. For, mango fruit being very rich attracts too many germs too quickly.

Consuming daily a cup of mango fruit juice along with honey and milk is a very healthy practice. This augments the acuity of hearing, promotes good memory power, increases virility, extends the span of life and confers considerable physical energy. This drink is infact a very delectable and an unfailing tonic to all.

Taking one fruit of mango daily during the season is a sure method to develop good power of resistance to disease. This also ensures healthy eyes and excellent vision. Since the fruit contains plenty of Vitamin-A it prevents the possibility of suffering from diseases due to the deficiency of this vitamin.

An excess intake of mango fruits may lead to indigestion. There is a belief that if one takes the fruit along with a little of its skin as well, one can avoid indigestion to some extent.

To avoid the possibility of such an indigestion from arising, eating a little quantity of powdered *omum* or *ajwan* is advisable. In case however such an indigestion has already set in and its ill effects are becoming manifested, prepare a decoction of ginger and take it. This will counteract the effect and give a relief from the distress.

Patients of diabetes should consume mango fruits in great moderation. The soft white seed within the stone of the mango fruit has its own medicinal cure. Take this out, cut into small pieces and grind into a smooth paste. Mix this with a cupful of butter milk, stir well and drink twice a

day. This is presumed to be a cure for piles, dysentery and diarrhoea. Taking a teaspoonful of this ground seed once a day will destroy round worms of the intestine.

Chewing well the young tender sprouts of mango leaves will stop bleeding of the gums. It will lessen the pain of the tooth-ache. This will also prevent coughing.

Take the tender leafy sprouts in some quantity. Boil them in water and prepare a decoction. Taking this decoction thrice a day will stop dysentery and diarrhoea.

In case there is an injury due to a hit or by means of a knife or a blade and the like and the blood is flowing, take some dried leaves of mango, set fire to them and prepare their ash. Spinkle this ash over the injury and keep it pressed down for some time. This will stop the blood flow and will also heal up the injury gradually. There will probably be no need for any other treatment at all.

Soak the seed kernel in water and grind. Apply the paste on burns and scalds. There will be an immediate cooling down.

For ringworm, apply the sticky juice that comes out where the stalk of the fruit is removed. This is quite curative.

Warm the leaf juice and use it as an ear-drop to quieten the ear-ache.

Grind small raw and unripe fruits and fix over the paining eye. The pain will get much quietened.

## B. BANANA

The term "banana" is a Spanish-Portuguese term taken from the native name from Guinea, while "plantain" (the other term whose origin is not known) refers in India to a coarse banana. Though the two terms are regarded as almost synonymous in popular notion, banana refers botanically to *Musa paradisiaca* subspecies *sapientum*, the most familiar and very important of the tropical fruits. From its origin in India/Malaysia it has spread all over the tropical world, there being no warm region excepting Sahara where it is not cultivated now. The plantain is a close relative of *Musa paradisiaca*, one of the great tropical food plants and a native of Southern Asia. This is cultivated for more than 4000 years, there being more than 75 varieties - all so old that they have been never propagated through seeds within recorded time. These are always eaten cooked or made into flour; they are highly digestive and form a valuable food for children and invalids.

Banana is possibly the world's oldest cultivated crop. It was known to be important in Assyria in 1100 B.C. and was also well known to many other early civilizations. It reached Polynesia also early and was carried to the West Indies in 1,500 A.D. There are nearly 300 varieties of banana now most of them grown in Tropical Asia including India.

There are two other important species *Musa nana* (a dwarf plant) and *Musa textiles* (almost tree like and yielding textile fibres called Manilla hemp).

Banana is so nutritious a food that one can live on them, as is actually done in some countries. It has appreciable amounts of vitamins A, B and E. In intestinal disorders, such as dysentery, gripings, malabsorption, giving 2 part of banana and 1 part of curd proves useful. The fruit is good in replenishing scanty blood.

The plant is so well known for its food value that its medicinal value which is equally considerable remains often unrespected or even unknown. This is for example invaluable in all cases of inflammations; it subdues intestinal inflammations effectively, specially the well ripe fruit, neither the under ripe (which is difficult to digest) and raw or the overripe.

As a food, the fruit is used in numerous ways specially in the countries of Tropical America, where it is so extensively consumed and almost replaces the cereals. A banana flour is prepared after drying it in the sun or even on oven and this is often mixed with other wholemeal flour to prepare bread and pastry. The ripe one is carefully dried and used as figs; the best Indian example here is *vasai* (near Bombay) banana which is always appreciated as a dry fruit. Raw banana (the coarser plantain specially) is a very common and much cherished cooking vegetable, specially in South India.

Folklore physicians of India and Iran recommend eating banana for its magical rejuvenating power. It is recorded that when Alexander reached these places in 327 B.C. he found the people extolling the eating of banana to ward off evil spirits and usher in a feeling of youth. The fruit is nowadays accepted as promoting healthy digestion and aiding in conferring a look and feel of youth. Bananas help in retention of calcium, phosphorus and nitrogen in the body all of which build youthful regenerated tissues. Its invertase sugar aids in youthful metabolism. It exercises an alkaline action in the intestines. Some medicative regimens exist when patients are advised to eat the fruit regularly and simultaneously exclude some incompatible articles then, such as many cereals and even sweets. The bananas are believed to exercise their full rejuvenation power then only and without any hindrance from other factors. Royal physicians had also kept their patients in the past on a regimen of eating banana fruit with non-starch vegetables and other fruits but not the acid fruits (e.g. oranges) and never with starches or proteins, or even milk. The common practice in India of fasting a day or atleast leaving one meal in a week and to sustain oneself on banana fruits then is a practical adaptation of this dictum.

The fruit is a golden treasure of health. It is alkaline internally and a chief source of calcium, phosphorus, manganese, vitamin A, pyridoxine, inositol, folic acid, vitamin C and many other nutrients. These maintain the health of the skin,

the eyes and the mucous membranes; detoxify infectious bacteria, aid in storing body protein, build resistance to allergy, relieve constipation so effectively that they are best advised for the patients of piles, sooth and heal colitis (twisting stomach pains) and ulcers, calm down kidney, increase the appetite and create a well balanced and vigorous digestive system.

No wonder, a plateful of banana fruit and a coconut are the invariable offering to God. The role that banana occupies in religious and cultural functions of India is multifacious. It is always regarded as auspicious but in Tamil Nadu specially the plantains are not advised to be grown in front of a house; it is always a backyard plant utilising the drainage water most healthfully. Eating food on the banana leaves is considered the best. Decorating the door ways for all auspicious occasion with the huge plantain trees specially those laden with the fruits and also a bunch of the unopened flowers hanging out colourfully, is a must. The chariots and *mantaps* for the Gods have smaller "trees" of plantain tied on the sides as necessary decoratives.

**Names**

Sanskrit gives a considerable number of names: *vanalakshmi, kadali, rambha;* (the unripe), *mochaka, gucchaphala, rajaphala* and so on.

Most regional languages of the North derive their names from "kadali" while those of the South from 'valai'. Its names are thus *kela* in Hindi, Marathi,

Gujarati, *keli kala* in Bengali, *vazhai* in Tamil, *vala* in Malayalam; *bale* in Kannada, *ariti kadalamu* in Telugu.

**Botanical Aspects**

Banana is probably the tallest of the herbs, for, though huge, it is not a tree at all. The robust tall tree like stem is a pseudo or false stem made up of strong, turgid sheathing leaf bases that grow to a height of 10-30 feet and bear a crown of huge, deep green leaves - or the leaf blades strictly - that may reach even 12 feet length and 2 feet width. The blade has a strong prominent midrib with strictly parallel veins laterally throughout. The tree stem is wholly underground and is in the form of a swollen rhizome, which is the sole means of propagation as the plant has "forgotten" reproduction by seeds at all. The blackish "spots" of the ripe fruit are all that remain of the seeds. Very rarely in wild species and almost as a freak, pearl like hard seeds do get formed in some fruits, but these are also nonviable. On maturity the plant produces only one inflorescence for which purpose the tree stem grows straight upwards as the central pith of the pseudostem and bears finally a large number of clusters of flowers, each cluster nearly surrounded by big, fleshy, reddish boat like spathes or bracts that fall off as the flowers mature. This soon curves down due to its own weight bearing the familiar bunches of fruits with the terminal inflorescence darting out as the pendulous finale. Marketable bunches weigh from 80 to 140 pounds and consist of 6-15 clusters or "hands" of "combs", each one

having 10-20 individual fruits. Bunches may occasionally have 22 hands and 300 individual fruits. The fruit is a modified wholly soft berry enclosed in green close fitting jacket that becomes golden yellow and loose on maturity. As soon as the plant bears one crop it dies down or is cut down, new plants springing from the rhizome below taking up its place for the next season.

Banana is a rapid grower and has a very high yield. It is one of the most important fruit and vegetable crops of India, cultivated on a large scale commercially and is also an almost invariable backyard crop of the households. The varieties of the fruits are also many and these vary much from region to region, each often professing that its variety is the best.

**Banana As Food**

In some parts of Kerala, in many pacific Islands and tropical Africa, banana is a staple food. Fresh fruit is eaten as a dessert while the unripe fruit and the fruit from the cooking types are used as vegetables. The fruit pulp is dried, processed into flour and preserved in many forms for future use. Various Indian confections are made from the fruits, such as *rasayanam*, *panchamritam* (with 5 ingredients, banana, milk, curds, sugarcandy and honey), sugar coated chips, toffee, coffee substitutes, jams and jellies. They are also canned.

Ripe fruit is rich in carbohydrates and fairly good as well, in minerals and vitamins, specially of the B

group. The detailed composition varies with the variety and the stage of maturity. Average (in percentage) values of some ripe fruit varieties are: moisture 60.6-79.8; protein 0.4-1.7; reducing sugars 3.6-24.6; non-reducing sugars 0.0-14.6; other carbohydrates, fats etc. 0.1-16.4; and ash 0.7-1,6. The values for unripe banana used for cooking are: moisture 60.4-72.4; protein 1.0-1.8; reducing sugars 0.1-0.2; non-reducing sugars 0.5; other carbohydrates (mostly starch) and fat 24.5-36.7, ash 0.9-1.3. The fruit ripened on the plant is the best.

The green unripe banana is mostly starch: as it ripens this gets progressively hydrolyed to soluble sugars with the result the total sugar in green banana becomes 15.20 in the ripe stage. The sugars are sucrose, glucose and fructose type mostly and maltose only to some extent.

There is another important component, the pectin in banana which is responsible for jelly making.

The principal proteins are: albumin and globulin.

A small amount of extractable tasty oil is also present in banana whose percentage however does not change along with ripening.

The fruit is a good source of calcium and iron and a rich source of potassium, magnesium, sodium and phosphorus. Iodine, aluminium, zinc, cobalt and arsenic are the minor elements. Ash is alkaline.

Green banana has calcium 10, phosphorus 30, iron 0.6, potassium 382; and sodium 67 mg in 100 gram.

The average vitamin percentage of the ripe fruit is carotene (as vitamin A) 8-470 I.U; (international units), thiamine 20-51 mg, riboflavin 21.71 mg, niacin 0.5-0.8 mg, ascorbic acid 5-17 mg/100 mg. Part of the acid is lost on cooking and 50-75% of it, on ripening.

Unripe banana is astringent to taste. The pulp of the mature fruit has 1.52-1.66% tannin which is much more in the skin, which also has rich amounts of chlorophyll, carotene and xanthophyll.

There also occur many enzymes: amylase, invertase, protease, catalase, oxidase and so on. There are two physiologically important compounds in large amounts: scrotonin and no-repinephrene; the medicinal properties of banana are mostly due to them. Serotonin inhibits gastric secretion and stimulates smooth muscles of the intestine and elsewhere. Norepinephrene is an important mediator of autonomous functions and widely used to bring about constriction of blood vessels.

The peel or the skin that is mostly thrown out is a very valuable material. It is a very good cattle feed comparable to hay of good quality nutritionally. It is a potential source or pectin. The skin and pulp of green banana has antifungal substances while those of the ripe banana contain both antifungal and antibacterial substances.

Banana flowers are good vegetables for cooking. They have moisture 90.2; protein 1.5; carbohydrates 5.0; fibres 1.9; mineral matter 1.2; calcium 0.003; phosphorus 0.05; and iron 0.1. The flower extract has an antibacterial activity.

The inner banana stem (pith) is another favourite vegetable specially in South India. It also has considerable mineral content and rich food values; it is an ideal food for the diabetic, as it contains a great amount of rouaghage (or undigestable fibres which stimulate muscular activity by their very bulk).

Green stems, leaves and root stock or rhizome are good, fleshy feed for cattle and sheep. Outer sheaths are elephant fodders.

Stem sap as well as the juice of the other parts of the plant stain the cloth black in a fast way; this can however substitute for making ink.

Fresh pseudostems contain upto 5% starch that can be extracted and used for eating. It forms a transparent paste with water and is regarded as useful in finishing stages of textile fibres.

Peeled leaf sheaths are dried and used for packing flowers, betel leaves, fruits etc. They are also stripped into threads, dried and used for tying or garland making. Banana fibres are also used as cordage, mat making and to make coarse paper.

Banana leaves are extensively used as food plates in Tamil Nadu; some varieties are grown exclusively for this purpose.

There are many commercial banana products. Some of them are as follows:

**Chips:** Fully mature but unripe banana of some special varieties (e.g.*nendran, monthan, kaio*) is cut into thick slices as in potato, fried in oil - preferably coconut oil, salted and sprinkled with chilly powder and eaten. The slices are dipped in sour water, washed well and dried in sun or home driers.

**Flour and Powder:** Banana flour is made from unripe fruit and banana powder from ripe fruit. The flour is mainly starch; the powder, richly sugary. For making flour dried chips are powdered in a mill and sieved. This is an infant food in Malabar and given as a gruel. Vermicelli and cakes are also made from the flour, and so also sweet and savoury dishes and bread and biscuit in combination with wheat flour. Banana powder is made from the pulp of the ripe fruit after mashing and drying in drum or spray driers and then sieving. The powder is used also in preparing beverages of the malted milk type.

**Figs:** Dried ripe fruits are called figs. For this, peeled fruits are cut lengthwise, each half cut further into pieces of one inch length. These are then dried in sun till they become soft and pliable. Figs of attractive colour and good keeping value are obtained by dipping the pieces for 15 minutes in sodium carbonate solution, washing then in water, exposing to sulphur dioxide fumes for an hour and drying in a cabinet drier at 55-60°. The figs are eaten as such or in puddings or beverage.

**Confection:** In South India, ripe fruit is used for making *panchamritam* (banana pulp, honey, ghee, sugarcandy, spices), *rasayanam* (fruit cut into chunks and then mixed with sugar, ghee and milk) and *pazha prathaman* a delicious *payasam* variety of Kerala or chunks are mixed with sugar, acidified with citric acid and canned.

**Formentation Products:** Banana pulp is occassionally used for making alcoholic beverage. Banana flour can replace malt satisfactoritly. Vinegar is prepared by formenting a mash of banana pulp and peel.

Banana is a good energy giver being richer in solids and lower in water contents compared to all other fresh fruits. Infact it is a good source of quick energy because of its high content of easily available sugars. The low content of proteins makes the fruit an excellent means of increasing calories in diet without increasing protein intake. The carbohydrates are readily absorbed and seem to be particularly well tolerated by the diabetic, the patient of sprue and the infant having celiac disease; infact it is a corrective of the last two afflictions. Calcium, magnesium, phosphorus, sulphur, iron and copper are some of the minerals offered by banana in significant proportions.

Leaves and ashes are very excellent manures.

**Banana as a Medicine**

Ripe fruit is emollient (softening, for instance, of hard abscesses), demulcent (soothing) and nutrient;

the unripe one is cooling, astringent and in the dry state anti-scorbutic (i.e. destroying scurvy disease). Fully ripe fruit is laxative, specially when taken in the morning. Flowers are astringent (i.e. contractive to live tissues and hence healing). Root counteracts biliousness and worm infection and is a valuable alterative (a drug that brings desirable alterations in many vital functions). Juice of the plant is styptic or stops bleeding. Banana regulates gastro intestinal functions probably by promoting intestinal growth of gram positive bacteria at the intestine and counteracts the colon types in the large intestine. Banana increases the alkanity of the blood and thus corrects acidosis due to acid diets. It has regeneration potency for red blood by stimulating hemoglobin production.

Ripe fruit is beneficial to the anaemic as it has much iron. It is a valuable diet in chronic dysentery and diarrhoea, when it is mixed with half of its weight in tamarind and a little salt. Juice of the fruit is sometimes made into a fermented liquor and given in atonic dyspepsia (indigestion due to a loss of muscle tone). In cases of sprue, diarrhoea and dysentery, a well washed fruit is given mixed with 4 ounces of milk and three times a day; this is curative and sustaining. Soup of raw fruit is also given for the same purpose; add sugar or sugarcandy instead of salt when it is meant for children. Syrup of banana is popular in America as a refreshing drink and an effective remedy for bronchitis or inflammation of the wind pipe.

Ashes produced by burning the plant are rich in potash salts and are thus useful in acidity, heartburn and colic.

Young tender leaves form a cool dressing material for the inflammed and the blistered surfaces. When the blister is removed, a piece of plantain leaf smeared with any bland oil is applied and tied as a bandage, changing the dressing atleast twice a day or as often as needed. Green tender leaves are good substitutes for guttapercha to treat exposed injuries and are extensively used in indigenous surgery, and also in water dressing of wounds and ulcers when the piece of the leaf used is large enough to cover the whole part and is kept in place by a suitable bandage. Older and greener leaves are excellent eye-shades in eye diseases and are so used.

Root when tender is used in making a juice with mucilage to check bleeding in genital and air passages. Root juice in which burnt borax and nitra are dissolved is given in urinary retention. Mixed with ghee and sugar it is given in gonorrhoea. Root is also useful to treat bronchocoele (wind pipe) and strumous (scrofulous) affections. Its cold infusion is useful in neutralising intoxication of liquour. For this, fluid extract of the root is given in a dose of 10-20 minims. The ash of the root is a worm killer.

Juice of the flowers mixed with curds is given in an excess of a disturbed menstrual flow; it is also used for dysentery. Cooked flowers are a good diet for diabetics; a soup of flower is given in convalescence after diarrhoea.

Juice of the "bark" (i.e. sheathing bases) and leaf is given to children affected with an overdose of opium. One ounce of it with an equal amount of ghee is a quick purgative.

Banana powder is effective in treating coeliac disease, sprue and other forms of carbohydrate intolerance in children. It is an useful ingredient for the infant's diet. Syrup from the ripe fruit given with milk serves for excellent infant feeding. The ripe fruit is useful in many diseases: diabetes, uremia, nephritis, gout, high blood pressure and heart diseases. Unripe fruits and cooked flowers are useful in diabetes. Fruit is somewhat scarifying, hence using it ground with the juice and vinegar against eczema, itching and minor skin affliction proves useful.

The freshly extracted juice of the central stem promotes sweat formation and quenches thirst.

Unripe fruit is a valuable article of diet specially for the diabetic; in dry or preserved states it cures scurvy. Flour made of green plantains and dried in the sun is used as *chapatis* in cases of indigestion accompanied with flatulence and acidity. A slight gruel made of banana flour mixed with milk is a nice and easily digestible diet for patients of gastritis or inflammation of the stomach. Combined with milk, banana is almost a complete food. In Mauritius, West India and South America the banana is dried in sun, powdered and given as an excellent light nourishing food to infants and invalids. The ripe fruit is cut and dried in the sun and preserved to be

used as a dessert. Excellent jelly is made from it for immediate use or as a preserve.

Banana is an excellent, nutritious, popular and well liked fruit. There are numerous varieties of this fruit. But from the health point of view almost all are more or less equal. It is one of the very easily digestible fruits and is strengthening to the body as well. It increases the body weight, gets easily assimilated and infact acts as an easily available tonic to all-for the healthy as well as the emasciated and the convalescing. It is cooling to the heat of the body, sweet in taste and amply nourishing as well as sustaining. Taking one or two well ripened banana fruits following meals ensures freedom from constipation, good tissue development and nice flesh formation.

The fruit can be used raw or on ripening. The raw ones are consumed after cooking or frying. They are both very favourite in Indian kitchen and enter into many tasty dishes mostly alone or with other vegetables, occassionally. The cooking variety should be used only when it is still green. Cooking some pieces of this raw banana in milk and consuming them will ward off piles, gastric ulcers and anal burning and pains following the passing of stools. Taking unripe tender banana fruits along with its skin will expel intestinal germs along with the stools. Raw banana is an excellent diet for patients of dysentery passing blood and also of diarrhoea. Take two such fruits and cook them well in hot ashes. Remove the skin and give the softened

pulp within to the patient. Flow of blood will get controlled. The pulp should be taken bland and as such, without adding either salt or sugar.

Raw banana fruits of the nendrem type common in Kerala is an excellent curative drug for gastric ulcers. For this pupose, select two such big fruits, remove the skin as well as fibres and cut the pulp within into small pieces. Cook them well in water into a soft consistency and mash fully. Add to this while it is being cooked-two teaspoonfuls of dry ginger powder and an equal quantity of cumin powder, as well as ghee and an adequate quantity of jaggery and mix well. Remove from the fire, cool down and use. Using this regularly as a diet would cure the gastric ulcers.

There are many medicinal uses of ripened banana fruit also.

Taking its soft pulp mashed well with butter milk ensures a sure quietening down of burning sensations at the soles of the feet, the palms and also the eyes. Giving banana fruit along with buttermilk proves beneficial to patients of typhoid fever, diarrhoea and piles.

Ripe banana fruit pulp is an ideal food for infants. Mash it well in milk, add honey and feed. Infants would very much relish this food and their development would also be greatly benefitted by this measure. For constipative troubles in infants, give them a drink of ripened fruit mashed well with milk and sugar. Pregnant ladies will find consuming ripe

banana fruits regularly would nourish their food well and will also pave way to a safe delivery. Eating banana fruit pulp mashed with sugar and honey would lessen the violence of cough and chest pain. Mashing the ripened sweet pulp well in milk and taking in is good for patients of gastric and intestinal ulcers. Taking a banana fruit and a cup of milk two hours after night meals ensures increase in digestive ability, augmentation in weight and a hightened aphrodisiac effect.

Take a big glassfull of tender coconut water. Mash a well ripened banana fruit in it. Add a spoonful of honey or glucose and mix well. Filter this mixture through a fine cloth piece. This constitutes a delectable and nutritious liquid diet for patients of tuberculosis, jaundice, typhoid and small-pox. All of these patients are in dire need of quickly absorbable and good quality nourishment. Administering this drink thrice a day admirably suits this objective.

Drinking the juice of banana and orange over an adequate time would ward off anaemia.

Mash well the pulp of a well ripened banana fruit in milk, add to this a spoonful of the juice of plantain flowers. Taking this twice a day for a duration of about two months would appreciably reduce the body weight. During this period both the sweat-meats and fried savouries should be strictly avoided. This is a good regimen for slimming down to those who are overweight.

However, patients of breathlessness and asthmatic troubles should consume banana fruit only under a physician's advice. Patients of diabetes should totally avoid this fruit, as it is rich in readily absorbable sugar; this is the opinion of many practising physicians.

Banana fruit can be usefully employed in treating an abscess. Mash its ripened pulp well, apply over an abscess thickly and tie a bandage. This will hasten the maturation of the abscess which will rupture out quickly, expelling pus and the vitiated blood. It will also get healed up quickly.

Prepare a decoction of the banana fruit skin and add a requisite quantity of sugar. This constitutes a good quencher of thirst. It will also result in good urination.

Take twenty one ripened banana fruits, take out their pulp and mash it well with eleven gram of tamarind fruit pulp. Grind them together. Taking this will remove constipation. Even if there has been a lapse of 2-3 days after passing the stools, which therefore becomes hardened, quite soon after taking this mixture, there will be a great relief in passing the motion.

· For the patients of diarrhoea, a drink of the juice of plantain flowers mixed with curds acts as a curative. This proves beneficial also to young girls suffering from excessive haemorrhage after menses. The relief obtained is quite quick.

The flowers of banana have an antiseptic properly. Curries prepared from these flowers prove beneficial to patients of many diseases particularly those that are due to incomplete assimilation of food. Such a curry if consumed along with curds will prevent excess of haemorrhage during menses.

Giving a cupful of the juice of plantain flowers mixed with another cupful of the juice of cucumber proves advantageous in cases of insufficient urination.

The fibrous pith of banana has many esteemed medicinal uses:

Since it contains a very great percentage of roughage value this is an ideal food for patients of diabetes. It can be taken in many forms and in many ways, always with a great benefit. Tender portions of it can be consumed raw, when cut into small pieces and made into a *pachadi* with curds, after little or no frying. In cases of insanity due to nervous debility and also epilepsy, squeeze the juice of this pith, mix it with tender coconut water and give it as a drink. This proves beneficial. The drink gives excellent results even for patients of diarrhoea and piles.

Curries of banana pith are health giving. This will destroy all intestinal germs causing disease and protects one from infection. But this should always be used in limited quantities and only occassionally. This curry is a good diet for patients of dysentery accompanied with bleeding.

Squeeze out the juice of banana pulp. Add sugar to this and consume. It is a refreshing drink that will quench down excessive thirst. The juice has a property of counteracting toxic elements. A drink of this juice is an effective antidote to cases of poisoning by opium and *bhang* as well as *ganza*.

Even the flakes of banana leaves are useful medicinally. These flakes are the lower sheathing bases of the banana leaves which together make up the banana tree. The flakes are always succulent, watery and fleshy. Squeeze out the juice here into a vessel. Take forty grams of this juice, add ten grams of liquid cow's ghee and administer to a patient of obstructed urine. Quickly he will pass urine. This is an excellent drug for this purpose.

Take some leaves of banana, burn them into ashes. Take two grams of this ash, add a gram of honey. Taking this as an electuary will stop persistent hiccup.

Very tender tips of the banana leaves can be cut into small pieces and then advantageously added to green gram *kochimber*. Since the leaves contain abundant protein, this is a very beneficial adjunct for this already rich salad side dish of *kochimber*.

Take a very well ripened banana fruit. Take out its pulp, mash it nicely in a cupful of sour butter milk. This is a very beneficial drink for patients of piles. This however is to be continued for a long time and regularly. These patients would also find it somewhat beneficial if they take a meal of curds rice mixed with jaggery.

## C. PAPAYA

Papaya or papeeta, (*carica papaya*) is a very common fruit all over India. But this is a plant which is a native of the West Indies, the shores of the Gulf of Mexico and perhaps of Brazil in South America from where many of our very common plants such as potato, and probably even chilly have come. However, the fruit of papaya and its cultivation in our gardens all over India are both very popular. This is a valuable food as well as a drug plant. It was first brought to India, to Kerala particularly, by the Portuguese 400 years ago. It is becoming a commercially profitable plant also of late, especially with the increasing awareness of the multisided uses of its alkaloid papain. The fruit is rich in many ways and the plant itself has quite a few medicinal properties as well. South America shows two more species of *Carica* viz *C.digitata* Shreng and *C.dodecaphylla* Vell, which are also medicinal. But it is only *C.papaya* Linn that has spread almost everywhere in the tropical countries.

### Names

The plant is totally unknown to ancient Sanskrit authors, it being a very recent introduction to India. The few names of Sanskrit viz. *chirbhita, eranda chirbhita* (similarity to castor for eg. in its leaves is stressed here) and *nalikadala* (referring to the large leaves that have a long and tubular or hollow stalk) are evidently given by recent scholars.

In English, there are many names to the plant, viz. Tree Melon, Melon Tree, Papaw, Papaya, Papeeta and Pawpaw.

Arabic and Persian call it *aanaba he hindi, amba hindi* (coming from India). Many of our regional languages have a name for this delicious fruit. It is called *papaya, pappaiya* in Bengali; *chibda, erandakakdi* (castor-cucumber), *jhad chilhadi, papayi* in Gujarati; *anda kharbuja, papaya, papita* in Hindi; *goppe, parangi* (a foreign fruit viz a *firangi*), *pappai,* in Kannada; *kappalam, karmmosu, pappayam* in Malayalam; *pappaya* in Marathi; *pappali, pappay, parangiamanakku* (a foreign castor plant) in Tamil; *boppayi, madananaba, madhumakamu* in Telugu; *eranda kharbhuja* (Castor like *kharbuja* - a melon) in Urdu, *omrita bhonda, popaya* in Uriya.

As can be seem from the above the basic name of this plant is *paw paw*, a term probably of the West Indies, from where the plant was introduced to start with. This is what many languages have adopted variously. It also forms a part of its technical botanical name as well, which is *Carica papaya* L belonging to the family called Caricaceae.

**Botanical Description**

This is a soft wooded, fast growing and short lived "tree" which is actually a giant herb of even 25 feet. The whole tree has a characteristic and unique appearance: a straight unbranched main trunk

bearing a crown of long stalked large palm shaped leaves looking somewhat like large leaves of the castor plant, which is why many regional languages associate a term meaning castor with this plant. The stem is succulent and very weak. The leaves are divided deeply into many large lobes looking like the fingers of a hand and their nerves are also arranged in a palmate or hand like manner; they are completely non-hairy. Flowers are pale yellow, fragrant and generally dioecioue i.e. they are either male of female and not both and they occur on separate plants. Therefore some are male plants and others are only female. Occassionally however some female flowers do occur on a male plant. Male flowers occur in long, drooping and much branched clusters. Female flowers on the contrary are found in small clusters. Fruit is fleshy with a massive edible and delicious mass with a characteristic odour. Few trees grow as rapidly or yield as heavily as this papaya. Seeds are numerous, black and enclosed in a sweet mucous pulp. They are covered with a loose hyaline i.e. glassy and transparent skin, which is botanically called arillus. Seed coat is thick, brittle and shrinks characteristically on drying. The wrinkled black seeds are often used as adulterants to black pepper which they resemble superficially.

Papaya is now cultivated throughout the tropical regions and in the warmest parts of the subtropics. The genus *Carica* has about 40 species; *C.papaya* is the most important and widely grown in India. Of

the rest *C.candamarcensis* (more frost resistant) and *C.monoica* (that can thrive in high rainfall and temperature) are important. Papaya cultivation is commercially very important as almost all parts are utilised, the most significant are the papain (a widely active protein digesting enzyme) and pectin (an important food adjunct that can also form jellies). Nearly every part is said to be medicinal. Fruit is wholesome and also digestive, carminative (gas expelling) and diuretic. Seeds are rich in protein and a fatty oil which is reported to be insect killing. Leaves have an alkaloid carpain and a rich amount of ascorbic acid. The plant is a perennial, a heavy yielder and very quick growing; its returns are also quick. Since papain is in great demand even internationally the area of cultivation is now enormous. After its extraction, large quantities of green papaya and a few ripe fruits would still be found; the latter can be pressed into jams, candies etc, but the green fruit cannot be sold because of the vissible cuts made during the extraction of papain. To profit from this situation, an integrated process for the production of papain and pectin was developed in the Central Food Technological Research Institute, Mysore, for complete utilization of all the fruits.

Papain is produced from the latex obtained from tapping the unripe papayas. It is a white or light brown amorphous powder with a characteristic odour and taste.

**Medicinal Properties and Papaya as Food**

The ripe fruit is tasty and is usually quite massive. Ayurveda considers it as astringent to the bowels and aphrodisiac i.e. increasing the urge of sex. It increases *vata* and also *kapha* but removes *pitta* or biliousness. It is reputed to cure insanity. Yunani physicians presume it to be a stomachic (i.e. removes gas trouble of the bowels) and diuretic (causes much urine flow). It cures inflammations in general and enlargement of the spleen. It relieves obesity and as such it is a good fruit for those who want to slim down by eating. It is used in haemoptysis (i.e. blood spitting), bleeding piles and wounds of the urinary tract. It has been found to be useful in skin diseases in general and ring-worm as well as psoriasis, a skin disease in particular.

The unripe fruit constitutes a good vegetable for many preparations though not very popular still, unfortunately. Its milky juice or latex has long been considered anthelmintic i.e. counteracting helminth worms and is principally efficacious in expelling round worms. It is applied locally to the uterine opening in order to bring about abortion.

The seeds are also said to be vermifuge i.e. capable of expelling or removing worms. But their major use has been in correcting menstrual disorders or as an emenagogue. There is a popular belief, quite strong particularly in Tamil Nadu that they may cause abortion. Even the fruit has such a reputation with the result women, particularly the pregnant women, generally avoid this fruit.

Papain, the characteristic digestive enzyme secured from this fruit, is a valued substance in medicine. This is also used in preparing chewing gums; it is obtained from the white thin latex or juice which is particularly abundant in unripe fruits. Carpain is an alkaloid that has an intensely bitter taste and a strong depressing action on the heart. This has been obtained from the fruit and the seeds but especially from the leaves.

In the Gold Coast of Africa, the roots are reputed to cure yaws, a tropical epidemic and contagious disease of the skin, also called button scurvy. The term yaws is believed to be perhaps from the name of this disease in the American Indians. The root is ground well and mixed with salt to form a paste which is then mixed with water forming a solution. This solution is used as an enema which in turn is supposed to cause abortion in pregnant women. The dry leaves when placed in water forms an yellowish liquour which is drunk to cure stomach troubles. In Surinam, the roots, the leaves and the seeds are all used as anthelmintics. A decoction of the leaves is given as a purgative to horses. Brazlians use the seed as a vermifuge. As a cosmetic the milky juice of the unripe fruit is applied for freckles (yellowish or brownish yellow spots on the skin, specially of fair haired persons) and also for rendering the skin smooth and delicate. Against round worms it proves an excellent remedy. In central and South America, the seeds are used as anthelmintic and emmenagogue to normalisc mensus troubles. They are given to quench thirst

and they also form a drink used in fevers. They do act as carminative removing the distress of the gas troubles of the bowels. Many preparations are made out of this fruit, in the several countries of America whose native is papaya, such as syrups, wines and elixirs - all from the ripe fruits. These are also utilized as expectorants (to expel phlegm by means of induced coughing), sedatives (to bring about a mild sleepy condition) and also as tonics. Pimples on the face are cleansed by the milk of the unripe fruit.

In Kelantan, in the Far East, the milky juice of the unripe fruit is used as a poison. In Cambodia, the roots are considered diuretic causing a good urine flow. They are also employed as hemostatic or an agent to stop excessive blood flow, for eg., during delivery. The seeds are prescribed in bites and stings from poisonous insects.

The fruits are fleshy berries resembling melons. They are green to start with and become yellow-orange on ripening and weigh upto 20 pounds; these are borne on long stalks just below the leaf crown. This is an excellent break-fast fruit; the orange, flesh has a sweet musky taste. It is also used as salad, pies (when raw) and *sherbets* and confections (when ripe). Unripe fruits are cooked and preserved; their commonest commercial use is as colourful cherry like pieces mixed with many types of breads and sweet-meats nowadays. For this purpose, the papaya pulp is coloured variously, cut into small-pieces and used as fruit stuffings.

In the Hawaian Islands, papaya is hailed as the melon of health as it is the preferred fruit medicine there to rejuvinate the digestive system. This is a very popular breakfast food there. Its papain enzyme promotes digestive vigour and this infact rejuvinates the whole digestive - assimilation process very remarkably. Vitamins and minerals in the papaya also act as respiratory aids; they ease coughing and promote favourable throat and breathing abilities. Papain also helps in dissolving the accumulated secretion in the skin pores. Many Hawaians use a papaya peel as a wash and scrub over the skin. This wipes away infectious wastes, cleanses the pores, improves aeration and thereby brings about a look and feel of an youthful skin. The fruit is praised very much there as an effective and soothing aid for digestion. They prepare a health-ful papaya tea which is very popular as well. The digestive efficacy of papain is somewhat similar to pepsin, a natural enzyme in our body. The fruit is also rich in vitamins, specially. A and C associated respectively with bodily growth and destruction of the scurvy disease. Hawaians use papaya in many ways. Slices of unripe fruits rubbed over meat or boiled with tough meat are said to make the meat tender. An excellent stew like the summer squash is prepared from the green fruit. The fruit is quite energising as well. Just one pound of this pulp will supply 177 calories of energy to the body, 2.7. grams of protein, 0.5 grams of fat, 45 grams of carbohydrates, 4 grams of bulk forming fibre (to aid in peristaltic movement of the digestive tract), 91

miligrams of nerve building calcium, 73 miligrams of bone strengthening phorphorus, 1.4 miligram of blood enriching iron, 7.945 International units of vitamin A that would vitalise skin, hair and eye, 14 miligrams of riboflavin to strengthen nerves, 18 miligrams of riboflavin to improve skin respiration, 14 miligrams of hormone feeding niacin, and 254 miligrams of vitamin C to rejuvinate skin health.

Raw Papaya juice helps to correct intestinal disorders quickly. This contains valuable proteins, many natural acids like citric, malic and tastaric acids and also potassium and phorphoric acids. Many Hawaiians drink a glass of papaya juice every morning. Papaya offers speedy relief in the complaints of dyspepsia, gastritis and digestive unrest. This is also regarded as an antidote, for disorders of the bowels and the stomach. They also prepare a natural fruit tonic thus: Crush the pulp of a well ripened fruit, thin it with orange juice, chill and drink in the early morning. Papaya powder is also made as a natural meat tenderiser. Papain splits starches and also helps in digesting fats.

**Constituents**

Young fruits secrete a white milky sticky juice like cream containing an alhuminoid, a digestive enzyme or milk curdling ferment, papain, Pulp of the fruit contains a caoutchouc (a chewing gum like) substance, a soft yellow resin, fat, albuminoids, sugar, pectin, dextrin and acids like citric, malic and tartaric. Dried fruit has a large

amount of ash 8.4 per cent, containing soda, potash and phosphoric acid. Seeds have a papaya oil, or carcin of a disagreeable taste and smell and several acids and a soft resin. Leaves have an alkaloid carpaine and a glucoside called carboside.

Papain though found largely in the fruit occurs all over the plant: root, seed and even leaves. This is mostly obtained by incising unripe fruit or the trunk of the tree; the latter hardens as it come in contact with air and forms crude papain. Pressing the fruit with a little water and letting the juice dry in the air will also yield a crude material - a fine whitish powder that form the raw material for commercial papain, a very useful protein dissolving enzyme much like pepsin of our body. This is much used in many medicines and also in preparing chewing gums.

Carpain found in fruit and seed and more specially leaf, is a very pungent alkaloid having a highly deleterious effect on heart.

The nutritive value of the fresh ripe fruit can be realised by noting that it contains sucrose sugar and invert sugar in fair quantities plus a resin, the three acids citric, malic and tartaric and of course, papain. Both ripe and unripe fruits contain abundant pectin (a jelly former). For every 100 gram of the fruit pulp there occur carotene - Vitamin A 2000-3000 international units, thiamin 15.63 micrograms, riboflavin 23.83 micrograms, niacin 0.15-0.76 miligram and ascorbic acid 33-136

milligrams. The darkened seeds have protein 24.3, carbohydrate 15.5, fatty oil 15.3, fibre 17, an essential or volatile oil 0.09-all in percentage, and, a trace of sulphur as well. The milky juice from the unripe fruit yields the papain which is effective at even greater temperature than pepsin collected from animals. The leaves have 286 milligram per cent of vitamin C and 36 milligram of vitamin B.

**Action**

Protein digesting ability of papain is praiseworthy. It is quicker and superior to that of the body's pepsin and works at a higher temperature and has an additional advantage in that it does not need the aid of either a free acid or an alkali to convert the contents of the stomach to peptone; 7 grains of papain powder can digest a pint of milk. Papain dissolves natural albuminoid materials such as muscles, false membranes of diptheria and cancerous tissues. It decomposes peptones much more quickly than pepsin. It is very energetic in hastening the decay of muscle fibres and nitrogenous substances.

Juice of the green fruit is an emmenagogue, regulating menstrual flow; in large doses it is ecbolic expelling to the foetus - that is why the pregnant are advised not to take papaya fruit. Using ginger along with the milk or the latex would hasten the meat tenderising effect of the latter.

Ripe fruit is digestive and alterative, bringing about desirable changes in vital functions of the

body. The green fruit is laxative and diuretic. The latex is an excellent digestive, worm killer, milk secreter, pain killer and cosmetically useful, as it removes patches and warts of skin.

**Uses**

Papain is used (in a dosage of 1-5 grains) mostly in cases of deficiency of gastric juice, excess of unhealthy mucus in the stomach, indigestion and intestinal irritation. It is used to dissolve the fibrous membrane formed in diptheria—its solution in glycerin being painted on the pharynx every 5 minutes. It is also applied beneficially in ulcers and tissues, of the tongue and as a pigment prepared with borax and water to remove warts, corns and other horny outgrowths on the skin, and also in psoriasis and chronic eczema, specially of the palms of the hand. The recipe is: take 12 grains of papain, 5 of powdered borax and 2 drachms of water; mix and apply.

Milk of unripe fruit with honey and followed by castor oil expels round worms. This is more efficient in dissolving albumen than pepsin. It is best gathered by longitudinal incisions on the fruit, collecting below and then placing it on a sand bath, dried at a low temperature, which will leave after 24 hours a dull white powder. This is excellent for internal use; 1-2 grains with sugar or milk after meals is to be given for adults. This is sold in the market as Finkler's papain. This milky juice is exported from Sri Lanka to Europe for manufacturing vegetable pepsin administered to

invalids with weak digestion. Its tincture is disagreeable to taste and does not keep well. It is best used as a syrup to children and women, most effectively in indigestion. It also removes tastelessness in food. Fruit is useful in chronic diarrhoea. Juice of the green fruit is applied locally as a pessary to uterus to induce abortion. Fresh milk juice is applied in ringworm and as a sure remedy for scorpion stings. Seeds are also employed and are the best for round worms in children. Juice of the fruit pulp removes freckles.

Ripe fruit eaten habitually corrects chronic constipation; it is useful in bleeding piles and indigestion. Boiled and mixed with lime juice and sugar it makes a delicious sauce. Dried and salted fruits are good in enlarged liver and spleen. Green fruits are made into curry and eaten by women to augment milk secretion.

Leaves dipped in hot water or warmed over a fire are applied to parts having nervous pains. Bruiced leaves are reputed to reduce growth in elephantiasis; inspissated juice of the fruit is given as pills for this purpose. In its action on the heart, leaf is like that of the famous digitalin. In small doses it is strengthening to heart and also removes fever. It contains vitamins C and E.

Even hanging meat in the tree of Papaya is reputed to make it tender. Green fruit pieces are commonly added with meat to make their cooking quicker. This forms a good cooling vegetable on its own merit, though many do not appreciate its value

as a fruit vegetable. It is also pickled. The fruits taste fine in themselves, but some like to take it with salt or pepper, or ginger or sugar and lemon juice.

The root, the leaf and the seed are used as worm killers, in French Guinea. Seeds are specially reputed for this purpose in many countries. A syrup, prepared from ripe fruit pulp is excellent against phlegm; it is strengthening as well as a pain remover. It is best used as an *asava* or a spirituous preparation.

In Cambodia the root is used as a diuretic and against plethora. Seeds are ground into a paste and applied over the bites of poisonous animals.

There are many household remedies associated with this newly introduced plant of papaya. A few are listed below.

Eating pieces of raw papaya fruit mixed with sugar will destroy round worms of the stomach. Cut a raw papaya into small pieces. Mix with this cumin powder, pepper powder and salt. Squeeze a lemon over it, mix well and eat. This will ward off constipation as well as indigestion. It will destroy round worms in the bowels. This is an excellent salad for feeding mothers, as their milk content gets augmented thereby. It also proves beneficial for patients of malaria.

However it is better that pregnant ladies avoid eating papaya, raw or ripened, till the third month. For, there would be a risk of abortion then.

One can very well chew and eat well cleaned tender leaves of papaya. This will also destroy all types of disease causing intestinal germs. Consume 20 or 30 papaya seeds before or after meals, as such or along with the pulp of the fruit. This is also a sure killer of the round worms of the intestine.

Make an incision on an unripe green papaya fruit on the surface by means of a small stick. Do not use any metallic object like nail or knife. The milk will start oozing. Let this drip on any wound you desire to heal. Then scrape the rind of the fruit to a thickness of orange skin, place this piece on the wound and tie a bandage. The wound would heal very quickly. This is a sure cure to germ or maggot filled wounds or even foul smelling ulcers.

Papaya fruit is an excellent laxative drug. It is also an equally excellent digestive. Taking the fruit after meals is a good procedure to ensure fine digestion. The fruit is a cooling agent to the heat of the body. A fruit salad of honey, milk and papaya fruit is an excellent tonic-ideal for heart patients and those who are having nervous debility. It is highly invigorating to them. For children, feeding mothers and pregnant ladies (after their third month) this proves a strengthening nourishment. Using this tonic during the treatment of eye diseases is particularly beneficial.

Papaya fruit is an excellent and medicated food for patients of piles, liver complaints and splenic diseases.

To remove the freckles, the pimples and disfiguring scars on the skin, keep rubbing the affected parts with the skin of the papaya fruit. They will disappear but after several attempts.

A fruit salad prepared with milk, honey and papaya fruit is a very delectable dish. Taking this daily is a good measure for the weakness of the heart and to invigorate the whole nervous system. The drink is so invigorating that you will feel very lively after such a drink.

In India there are three types of papaya: the South American variety, the Hill variety growing at an altitude of 600 metres and the Indian variety. Further horticultural varieties are many more; a notable one is that which is almost seedless and another whose flesh is rather hard and almost reddish.

As a fruit it is rich in Vitamin A 13000 International Units per gram, Vitamin C 130 per miligram, 86.6 per cent water, 0.5 per cent proteins, 9.5 per cent carbohydrates, 0.01 per cent calcium, 0.04 per cent iron, 0.4 per cent mineral salts and 0.3 per cent phosphorus. It also has citric, tartaric and gallic acids. It has much Vitamin D also. Its vitamin C corrects bone deformities, Vitamin A renders the body supple and flexible and ensures sharp vision and a healthy body. The fruit helps also in balancing cholesterol level in the blood.

## D. GRAPE

Grapes occur in a wild state in many temperate regions of the world, Europe, Asia, Africa and America, widely distributed as they are, by birds. They have been cultivated for over 4,000 years in the old world, being a native of the Mediteranean region and Central Asia. The modern cultivated varieties are derived from the European and the American species, probably originating along the Caspian sea.

**Names**

Sanskrit gives its names as *draksha, mridvika* (the soft), *hara hura, kapisha, charu phala* (charming fruit), *gostani* (cow's udder).

In Hindi, it is *munakka* (the large sized dried and black variety), *angur, datch;* Gujerati, *darakh, drakhsh;* Bengali *angur;* Tamil, Kannada, Marathi and Telugu *draksha;* Persian, *khismis.*

Grapes are mostly eaten fresh or used as juice. But a large quantity of special varieties (best known in France) goes in for making quality wines, a fine French art. Most of the waste products of the grape industry are highly utilized. Fertilisers, stock feed, acetic acid, cream of tartar, a fixed oil and tannin are some of the products from some part or the other of the fruit. Occassionally grapes are grown for ornamental purposes. Its wood also has some value.

Wine is the preeminent product of grapes; unless some specific fruit such as blackberry is mentioned wine always means the fermented juice of grapes, cultivated for that purpose since several centuries. Wine making is an art requiring great skill and expertise, the finest wines being produced in the older wine growing Countries like France that have years and years of experience. It is a costly but profitable business.

**Medicinal and Other Use**

Parts of the plant used are: Fruits-ripe, unripe and partly dried (raisins) and leaves.

Fruits contain grape sugar (glucose), gum, tannin, tartaric, citric, racemic and malic acids, sodium and potassium chlorides, potassium sulphate, tarterate of lime, magnesia, alum, iron, some albumin, ozotised matters and acid tartrate of potassium. Tartaric acid is the characteristic acid of the grapes. Raisins contain calcium, magnesium, potassium, phosphorus and iron in an assimlable form and also gum and sugar. Seeds have a dense fixed oil or fat and 5 per cent tannic acid. Skin also contains tannin. Wine has 24% of alcohol.

Grapes are cooling, laxative and refreshing; they are good for stomach and effective as diuretic, promoting abundant urination. Raisins are laxative, cooling and expectorant (causing expulsion of phlegm by inducing coughs); they are highly nutritive and excellent blood purifiers. Juice of the unripe fruits and leaves is astringent (and, thereby healing).

Both grapes and raisins are greatly esteemed in India from very ancient times; as dessert fruits after dinner, they are excellent. *Sultana* is a dried fruit of a seedless variety much cultivated in Greece; this is commended in some forms of anaemia and wasting diseases - the patient is asked to eat one fruit every 5 minutes for many hours of the day. Grapes are useful in biliousness, haemorrhage and many urinary disorders - such as absence of or difficulties in urination and stone in urine. They are beneficial in chronic bronchitis, heart disease, Bright's disease and gout.

Strained juice is given in teaspoonful doses every night and morning for children in constipation during teething and also to prevent convulsions due to constipation. Grape juice was previously employed in Europe for epilepsy. This is also good for thrush in children and invaluable in fever and severe colds. For patients of jaundice it is an effective diet. Juice of sour grapes is good for sprains and bruises. Raisins are very beneficial in thirst following fevers, coughs, catarrh, jaundice, consumption and subacute cases of enlarged liver and spleen; the seeds are to be discarded here. For acidic indigestion, Chakradatta, recommends raisin, sugar, honey and the *triphala* powder to be taken in equal quantity after cleaning the stomach with vomitings.

Ashes of the wood are believed to be preventive of stone formation in the bladder and are useful in cold swellings of the testis and also piles. Juice of

the unripe grapes is used in Italy for throat diseases. Leaves are occasionally employed in diarrhoea. Seeds yield a bland fixed oil, which (like the powdered seeds) has been seen to be efficacious in many cases of diarrhoea. Grapes are also useful in scorpion stings.

Grape juice is unfailingly beneficial for fever and T.B. patients and also for the weak and those who need iron. It should then be seen that skin and seeds should be always discarded. Malaria patients however should eat the whole fruits with skin and seeds, chewing them thoroughly. To prepare the juice for these patients, pulverise the whole fruits and then strain.

Ripe sweet grapes are nourishing and fattening. They are excellent for kidneys, as they cause an effective urine flow. Patients of gout and rheumatism find the grapes (excepting the green variety) incompatible. Excluding these, all others will find grapes highly beneficial in producing heat and also to counteract rapid wastage of the body tissues. In Mediteranean coasts where grapes grow in abundance, patients of T.B.are often maintained for days together on a sole diet of grapes. They invariably improve.

**Some Household Tips**

There are many varieties in grapes. Two of the most common are the white and the black ones. Of these, the white is more useful than the black. Gravy or *sherbet* prepared out of the white grapes is

tastier and more cooling to the brain. They also contain greater glucose content. Grape juice is a good quencher of thirst. It will also remove the feeling of tiredness and fatigue. It also acts as a strengthening tonic. Regular using of the white grapes will not allow the complaints of gastric ulcers, rheumatism, consumption and anaemia before and after child birth to go out of control and become too strong.

Grape juice is a stimulating and an invigorating drink. This will bring about an effective cleaning of the bowels. For patients of fever, a drink of grape juice will cause an excessive urine flow and an effective removal of toxoid substances thereby. For patients of diabetes grape juice with sugar acts as a beneficial beverage. Mixing honey with grape juice and then drinking it would augment blood formation in the body. It acts as an invigorating agent for all cases of nervous debility. This is a specially profitable tonic to patients of anaemia.

Eating sour grapes will remove acidic belching, indigestion, bloated stomach and constipation. It will make the belly to get a sense of lightness all over.

Dry grapes are rich in sugar; they contain 86 per cent of sugar. This sugar removes nervous debility effectively. It is particularly beneficial to patients of tuberculosis; fresh blood gets formed thereby in abundance. Keeping on taking dry grapes is very salutary in any type of disease. Morever it is the *one*

substance that such a patient does not loose the taste for, as he frequently does, to almost any other edible stuff. Besides, this measure also has a curative effect.

Charaka goes to the extent of asserting that dry grapes alone are the best; more importantly if one consumes only such dried grapes as the only food for a couple of months together, he can get cured from any disease whatsoever, - even a disease which has not reacted well to any type of medical treatment so far. The patient should take care however not to eat anything else at all during the whole period.

Soak a fistful of dried raisins overnight in water, milk or curds. Consume them the next day morning along with water, milk or curds. This is an excellent dietary article and is equal to a fully balanced meal. Eating dried raisins after boiling them in milk is also equally wholesome. Using these raisins along with other sweet-meats or even with other savouries renders them tastier and more nutritious. Eating the raisins is a cure for constipation, indigestion and sexual debility. It is invigorating and sure to confer a desirable liveliness. These raisins have iron and calcium content. They strengthen the bone therefore, promote fresh blood formation and also confer a considerable power of disease resistance.

Soak a fistful of dry raisins in water overnight. Squeeze the grapes well and then decant out the water. This is the *sherbet* of the dry grapes. It is a

sure remedy for old and chronic skin diseases which will then get cured quickly.

In chronic catarrh (running discharge) of the lungs and mucilaginous discharges of the bowels, administering grape juice is a sure cure.

Patients of consumption even in advanced stage will undoubtedly find eating grapes as highly useful. They are advised to take a whole diet of grapes as long as they can. This will enable them to regain their health and vitality. Even 2 days of regular intake of the grapes would show its beneficial effects.

If some one is suffering from acid gout and gravel, give him green grapes in plenty.

Grapes help cough and throat afflictions and are also beneficial to liver, spleen and bladder.

In the off season, when fresh grapes are not available, soak the raisins overnight in a bottle with a tight lid and eat them next day morning slowly munching along. They are very nourishing and highly restorative.

For patients with gastric complaint give raisin tea as the main drink and banana as the only food for some time. Grapes contain albumin that helps in repairing tissue waste and also to build anew. They are anti scurvy and also the best means to replenishing nervous system. Sweet grapes always strengthen a weak digestion and cure scantiness of blood unfailingly.

## D. GUAVA

Guava or *amrud* technically called *Psidium guajava* Linn. is one more tropical American fruit, cultivated there for centuries and well cherished by the Incas. This was brought to the old world by the European colonizers and is now well spread over most tropical regions and is often referred to as the apple of the tropics. It is fully naturalized in India, with many horticultural varieties; Allahabad and the almost seedless variety being one of the best. The fruit is a very aromatic, sweet, juicy and much liked fruit with a delectable balance between the content of acid, sugar and pectin. It is one of the richest sources of vitamins A, B and C and ascorbic acid. It is much favoured as a fresh fruit very likable when correctly ripe, neither more nor less, but is equally well utilized for jellies, preserves, pastes and powders. The powder from dehydrated fruits is used to strengthen other fruit juices.

Guava belongs to the family Myrtaceae which probably has more number of edible fruits than any other family. Besides guava of which there are 150 species, there are *Eugenias* and *Syzygiums* with about 700 species: rose apple (*Syzygium jambos*) - greenish yellow fruits from Central Asia used for preserves and candy, and *jamun* which we shall see latter.

### Medicinal Use

It is acrid and sour plus sweet in taste, with a very agreeable flavour. It is said to cause *kapha*

aggravation but to cure *vata* and *pitta* aggravation. It is also useful in biliousness or liver troubles. Its taste is sweet and astringent. Eating of the seeds may lead to constipation. Unripe fruits are used in diarrhoea. Ripe fruit is good for eating, but is rather constipative. It is to be eaten with the rind; otherwise its conspative action is pronounced.

The leaves are used in healing wounds and ulcers, and also as an astringent (i.e. constrictive and thus helping in rectifying) drug and in bowel disorder. The flowers cool the body. They are used in bronchitis and applied to the eyes as a cooling agent. Yunani physicians consider that the anthers (which contain the pollen grains) of the flowers are good to dry the wounds; they also cool the "heated" brain. The fruit is a tonic, cooling and acts as a laxative, if taken after food. It is useful in quenching thirst, cooling the body and good in colic or twisting pains of the bowels. It helps in stopping the bleeding of the gums. The gum exuding from the stem is a tonic while the ash is a caustic (i.e. it causes a corrosive action on skin and flesh).

The bark of the root of the var. *pyriforum* is valued for its astringent property or as a contractive to living tissues and hence healing. It has been employed with success in the diarrhoea of children. This is used generally in the form of a decoction. The decoction also serves well in the prolapsed anus of children. Young tender leaves are employed as a tonic to correct the disease and disorders of the digestive functions. The bark of the var. *pomiferum*

also possesses similar properties. A decoction of the leaves has been used in cholera with considerable success and in arresting vomiting and diarrhoea.

The leaves are reputed to be a remedy in toothache, when chewed.

In the Gold Coast of Africa the roots are beaten and mixed with water and used in curing diarrhoea and dysentery. The leaves are chewed to relieve toothache. In Guiana of South America the roots, the leaves and the buds are considered astringent and countering dysentery. An infusion of the roots and leaves is a popular astringent drink. A decoction of the young leaves and shoots is prescribed in the West Indies as a febrifuge (a cure for fever) and in baths meant for controlling spasmodic convulsions. An infusion of the leaves is also used in cerebral i.e. brain affections, nephritis (inflammation of the kidney) and cachexia (or a progressive wasting away and depravity). The leaves are pounded and used in rheumatism locally. An extract of it is used in epilepsy and chorea or St Vitus's dance which is a nervous disease causing irregular involuntary movements of the limbs or face. The tincture of the leaf is rubbed into the spine of children suffering from convulsions. The fruit and its conserve preserved in sugar are astringent in action and therefore beneficial to those who suffer from diarrhoea and dysentery.

Extracts of leaves, flowers and fruits were found to be active against important disease causing bacteria, such as *Mycrococcus pyogenes* var. *aureus*

and *Escherichia coli.* Fruit extracts are similarly active on enteric pathogenes like *Salmonella hyphosa* and *Shigella antydysenteria.*

Leaves are used for wounds, ulcers and as an astringent to heal bowel lesions. Young leaves form a tonic in digestive diseases. Their decoction is used in cholera to arrest vomiting and diarrhoea, fairly successfully. An infusion of the leaves and roots is a popular astringent drink in Ghana. A decoction of the young leaves and shoots is prescribed to ward off fever and also for baths that would counteract spasms or involuntary contraction and expansion. Infusion of leaves is used beneficially in cerebral affections, kidney inflammation and cachexia. This is much useful in prolapsed anus in children. The pounded leaves are applied locally in rheumatism. Its extract is used in cholera and epilepsy. Its tincture is rubbed over the spine of children having convulsions. Gargling with leaf decoction relieves tooth ache and gum boils. Leaves when ground make excellent poultice. Bark is valued as an astringent and employed as a decoction in diarrhoea in children. It is a tonic and its ash is a caustic.

**Guava as Fruit**

This is sweet, juicy, much favoured and mostly eaten fresh but also canned, preserved, spiced or made into jam, butter, marmalade, pie, ketchup and chutney. Havaians make an excellent juice for feeding children instead of orange or tomato juice. It is richest in Vitamin C (4-5 times more than of

citrus fruits even) and has a good deal of pectin. In Vitamin A it is inferior to mango and apricot but superior to most other nutrients. Its constituents are (in percentage) moisture 81.7, protein 0.9, fat 0.3, fibre 5.2, carbohydrates 11.2, mineral matter 0.7, calcium 10, magnesium 8, oxalic acid 14, phosphorus 28, iron 1.4, sodium 5.5, potassium 91, copper 0.3, sulphur 14, chlorine 4, thiamine 0.03, riboflavin 0.03, nicotinic acid 0.4 and vitamin C 212 miligram 1 in 100 grams. The seeds make up 6-12 per cent of the whole fruit and contain upto 14 per cent of orange yellow, aromatic, fatty oil.

There are quite a few important and commercial guava products; guava cheese, canned guava, guava jelly, dried guava as such or as pulp in the form of sheets and also guava juice, juice powder, concentrates and nectar.

**Other Uses**

Leaves are a good source of tannin (13 per cent). It can be used for tanning soles and heavy leather and also for the upper leathers in combination with other suitable tanning materials. Leathers tanned with guava alone or with myrobalan (*harad*, 3:1) did not crack even after 6 months and were still of fine, smooth and fine grain. Leaves have a yellowish green or yellowish red, pleasantly aromatic oil and also resins, sugars, carotene, Vitamins B1, B2 and B6, niacin and Vitamin C.

The bark also has a good amount of tannin and is used for tanning and dyeing.

The wood is smooth, and works well, being used for wood engraving, spear handles, instruments and lac-turnery.

**Some Household Tips**

Eating raw guava fruits would lead to stomach pain. But eating them after chewing them well with teeth would prevent bleeding from the gums and harden them as well.

One can prepare a decoction from small sized tender raw guavas. Taking this with butter milk is a definite cure for mild forms of dysentery, diarrhoea and chest pain.

Even well ripened guava fruits should be eaten in moderation. Eating them in excess is sure to result in stomach-ache. To get rid of this blemish eating the fruit with salt and black pepper powder is advised. One can secure a similar effect by picking out the seeds from the pulp, chew them well with teeth and then consume.

Remove all the seeds from the pulp of a well mature fruit. Mash this well with milk and honey. This constitutes an excellent tonic which is rich in calcium. This is very beneficial to the pregnant ladies, children and feeding mothers. This *rasayana* is an energising elixir for patients who are undertaking treatments for such diseases like premature aging, gastric ulcers, pains during menses, heart troubles, lung and tracheal infections, breathlessness and consumption.

Grind the leaves of guava into a paste and apply over the face. This will cure the pimples.

Grind these leaves similarly but with turmeric as well. This is to be applied for psoriasis as an effective remedy. Apply this over the head before you go to sleep at night. Take a head bath the next day morning. This measure will remove all head lice.

Applying a paste of the ground leaves all over the body and then taking a bath would remove foul smell from the body.

Prepare a decoction from tender young leaves of guava. Add a pinch of salt and gargle twice a day. This will remove sores of the mouth and stop bleeding of the gums. If one cannot prepare such a decoction, chewing such leaves well and sucking the juice in, will itself afford considerable benefit.

To get rid of itchings all over the body, eruptions and biliary out-breaks on the skin, take equal proportions of tender leaf sprouts of guava, turmeric, bitter guard, *Coleus* leaves, *methi* seeds and coriander. Grind them together to a smooth consistency in cow's urine or curds. Apply this all over the body, massage well and after some time take a bath in luke warm water. But do not use ether soap or soapnut powder.

Soak the fruits of guava in water. Using this water for thirst in diabetes is good.

**A Relative of Guava**

There is a very valuable relative of guava, technically known as *Feijoa sellowiana* of the same family Myrtaceae. This is also from South America, specially Brazil where it is abundant. But the plant is well naturalized in South India now and is quite commonly grown in house compounds in Kunor and Nilgiri Hills. It is called pineapple guava or Newzealand banana in English. It is a small sized tree of 15-18 feet, bearing fruits that are similar to guava in shape, size, appearance and aroma. They are made into *murabbas*, salad, *kochumber*, or used even as a vegetable. Even the petals are used as salad. The fruits are very rich in vitamin C and characteristically contain a volatile oil. The speciality of the fruit is that it also has a taste and fragrance of pine apple fruit. And, very significantly this is a very rich source of water soluble iodine compounds that makes the fruit very important nutritively.

There is a great need to popularize this valuable addition to our fruits very much more. In fact this delicacy is at present confined to very restricted areas unfortunately and not known at all in many places.

**E. JAMUN**

What is popularly called jamun fruit is an edible berry which comes botanically from more than one species of the genus *Eugenia* belonging to the Family Myraceae. They are often considered as

different "varieties" of jamun in popular language and given related names in our different regional languages. As such it becomes relevant and necessary to consider all of these species of *Eugenia*, specially their points of distinction as well as the several medicinal properties associated with them in folk practices as well as Ayurveda.

The species are: *Eugenia jambos* Linn. *E.operculina* Roxb, *E.jambolana* Linn. *Eugenia spicata* Lam. and *E. hemispherica* Wight.

The fruit and the bark of all the plants are mildly astringent.

The following key will aid in identifying these species differently.

A. Flowers are showy, their parts (such as sepals and petals) are 4 in number. Seed inside the fruit is large and covered with a thick, fleshy endocarp or the inner layer of the fruit

*E. jambos*

B. Calyx tube is hemispherical in shape.

*E.hemispherica*

C. Calyx is elongated. Flowers occur in terminal and *axially* corymbs—all flattish topped. These clusters are recemes where flowers are all stalked and are arranged on a central axis but since the stalks of the flowers are of unequal size all the flowers bloom on a same level at the top of the cluster. The corymbs may be terminal or axillary. *E.spicata*

D. Petals are united. Leaves are opposite.

1. Leaves are broadly ovate or elliptic, apex is rounded or sometimes obtusely acuminate viz. drawn out as a tail with an obtuse base. Nerves on the leaf blade are few and placed distantly from one another. *E.operculina*

2. Leaves are ovate or oblong; apex is obtuse or more or less acuminate. Nerves are many and placed very closely amongst themselves. *E.jambolana.*

1. **Eugenia jambos** (Named after its Indian name jamun) Linn.

**Names**

Many of our regional languages have a name for this plant. It is called *gulab jamb, jamrul* in Bengali; *gulab jaman* in Hindi; *jambu, jambunerale* in Kannada; *champa, jambavam, jambu, malakka champa* in Malayalam; *nagapalam, naval, perunaval, sambunaval, sambunagai* in Tamil; *jambuneredu, peddaneredu* in Telugu; *gulab jamun* in Urdu and *globjamu* in Uriya.

It has a few names in Sanskrit: *brihatphala* (large sized fruit), *jambu, jambu raja, nanda* (pleasing), *phalendra* (lord among the fruits), *raja jambu, shuka priya* (loved by the parrots), *kokileshta* (liked by the Cuckoo or koel), *surabhi patra* (with fragrant leaves).

English calls it Malay Apple or Rose Apple.

**Medicinal Property**

Parts used medicinally are bark; leaves, fruit and seeds.

The bark is sweet and acrid in taste. It is astringent to the bowels. It improves the quality of the voice and is used in asthma, thirst, fatigue and also dysentery. It is good and beneficial in horaseness of the voice due to too much speech and also in bronchitis. The fruit is tasty and sweet. But it is rather indigestible and astringent to the bowels. Yunani physicians consider this as a tonic to the brain and they also use it in liver complaints. Seeds are also regarded by them as astringent to the bowels and have a beneficial application in syphilis. They are also used in diarrhoea and dysentery.

The leaves are boiled and used as an application in sore eyes, in Bhamo region of the upper Burma. In Vietnam the bark-is used as an astringent and every part of the plant is considered as digestive, stimulant and capable of removing the dental pain. In Cambodia, the water in which the leaves have been macerated (or, kept steeped in) is used in fever.

The fruit is delicious and has a faint flavour of rose. In fact a fine rose water can be distilled from the fruit. Seeds are useful in diarrhoea and dysentery.

An alkaloid called jambonine and an essential or aromatic volatile oil is found in this plant.

**2. Eugenia operculina** Roxb.

**Names**

Sanskrit authors call this as *bhramareshta bhringavallabha* (liked by the bees; a swarm of them is usually seen hovering over the honey rich flowers), *bhumi jambu, jala jambuka, kashta jambu, pikabhakshaka* (fruits eaten by cuckoos), *sukshma patra* (leaves small).

This is known as *paiman* in Garhwal; *dugdugia, jamawa, paiman, piaman, raijaman* in Hindi; *naral* in Malayalam and *monisia jama* in Uriya.

**Medicinal Properties**

The bark is acrid and bitter in taste. It is refrigerant (cooling), heavy for digestion, but a tonic and astringent to the bowels. It is said to be aphrodisiac or promotive of the sex urge. It is given in dysentery, diseases of the blood, bronchitis, biliousness and ulcers.

The fruit is considered beneficial for rheumatism in Chota Nagpur. The root is also used in this condition. It is boiled down to the consistency of a syrup and is applied to the joints by rubbing over the region concerned. The leaves are much used in dry fomentation. In Tongkong in Burma leaves are used as a substitute for tea and the flowers as a substitute for the leaves of eucalyptus which also belongs to the same family Myrtaceae.

***3. Eugenia jambolana*** *(from the Indian name* Jamun or *Jambo)* Linn.

**Names**

This is the Jamun fruit.

Sanskrit authors call it by many names: *brihaspati* (the preceptor of the Gods) *jambavam, jambu, jambula, kakajambu, mahaskandha* (a large tree with a great trunk), *megha modini* (delighting with the clouds, so high does it grow as to be reaching the clouds), *meghavarna, nila phala, shyamala* (all referring to the blue cloud like colours of the fruits), *rajaphala* (the kings fruit), *shuka priya* (loved by the parrots) and *shveta jambu* (referring to the white surface of the trunk?).

**Medicinal Properties**

The bark is acrid and sweet in taste, digestive and astringent to the bowels. It is anthelmentic or counteracting to worm infection. It is good for throat, bronchitis and asthma as well as thirst. It has been found to be beneficial in biliousness, dysentery, blood impurities and ulcers. Its decoction with or without cardamom and cinnamon is useful in chronic dysentery, and as a gargle for sore throat and spongy gums. Its paste is applied over inflammed parts.

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smell from the mouth and is also used in biliousness. The seed is astringent to the bowels and sweet. It is good for diabetes; its powder is used to reduce sugar in urine and quenches the patient's inordinate thirst. For this the liquid extract from the juice of the ripe fruit is also used in half to 2 drachms.

It is also a good diet for convalescents from diarrhoea and dysentery. This is infact one of the few fruits (the other is apple) that the diabetic can take.

The ash of the leaves is used for strengthening of the teeth and the gums. Juice of the tender leaves is given in goat's milk for dysentery discharging blood.

Yunani physicians consider the fruit as sour, acrid and sweet. It is a general tonic. In addition it is a tonic to the liver, enriches the blood and strengthens the gum and the teeth. Its syrup is a very pleasant and refreshing drink. It is a useful astringent in bilious diarrhoea and constitutes a good gargle for throat upsettings and sore throat and also a good lotion for ring worm in the head. The vinegar from the fruit is tonic, astringent and carminative and is useful in the diseases of the spleen. The seeds are astringent and carminative (capable of removing gases from the bowels) and stops urinary discharge.

The astringent bark is used alone or with other similar drugs in preparing astringent decoctions,

gargles and washes. Fresh juice of the bark is given in goat's milk for diarrhoea. Expressed juice of leaf is used alone or with other ingredients in dysentery as an astringent.

From the juice of the ripe fruit a vinegar is prepared. This is a pleasant and agreeable drink which is good for stomach and helps in removing gases from the bowels as a carminative. It is also a good diuretic. Ashes of the bark mixed with oil forms a drug of choice for treating burns.

**4. Eugenia Spicata** Lam.

**Names**

There is no name for it in Sanskrit or Hindi.

It is called *jambosier de ceylan* (the jambu fruit from Cylon) in Indo China; *gudda panneralau* (the hill jamun), *kunnerale* (an inferior *jamun*), *nerkal* in Kannada; *nyara, puvala, veluttanaral* (the white *jamun*) in Malayalam; *bhedas* in Marathi; *maran, marando* in Sinhalese, *manungi* in Tamil; *sagara batna* in Uriya.

**Medicinal Property**

In Indo-China the plant is held in great esteem as a stimulant, anthelmintic (counteracting the worms) and also as a cure for the dreadful venereal disease of syphilis.

**5. Eugenia hemispherica.** Weight.

**Names**

This also has no name in Sanskrit or Hindi.

It is called *banenerale* (Jamun of the jungles), *makki nerale, mattanerale* (inferior jamuns) *nayinerale* (dog's jamun) in Kannada; *payanaval, vellanaral, vennaral* in Malayalam and *vellai naval* (the white jamun) in Tamil.

**Medicinal Property**

A decoction is prepared from the bark and this is used in biliousness or in treating syphilis.

**Some Household Tips**

The juice of jamun fruit has three important properties: it is digestive of food, it is mitigative of *pitta* aggravations and it quenches thirst. A refreshing *sherbet* can be prepared out of this juice. This will also obviate watery purging. Taking a cupful of this *sherbet* with a spoonful of honey added to it is useful in cases of burning sensation at the soles of the feet, and palms, burning eyes, piles, scanty urination and sleeplessness.

Grind a few leaves of *jamun* into a fine paste. Apply this to the scars of burnt wounds. The scars will gradually disappear.

Prepare a decoction of the tender leaves of the plant. Administer 4-5 spoonfuls thrice a day. This is an excellent remedy for dysentery and diarrhoea.

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