



Traditional Family Medicine



Vegetables

Carrot	– <i>Gajar</i>
Radish	– <i>Muli</i>
Sweet Potato	– <i>Shakar Kand</i>
Brinjal	– <i>Baigan</i>
Tomato	– <i>Tamator</i>
Lady's Finger	– <i>Bhendi</i>

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HEALTH SERIES :
TRADITIONAL FAMILY MEDICINE

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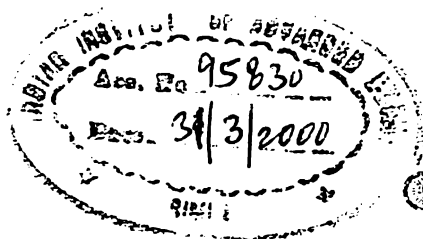
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K.H. KRISHNAMURTHY

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The information contained in these pages has been culled from various sources. This information is solely meant to create an interest about the wondrous qualities of our medicinal plants. On no account should this be utilised in a lay manner. Help of a trained physician is necessary.



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INTRODUCTION

The importance of having vegetables as a necessary ingredient of our daily and routine food can never be overestimated. Besides adding to the real relish in food, as, without them our eating would be uninviting and insipid, they confer a great number of health benefits.

Strictly speaking, all plants are vegetables. However, the term is restricted more to the edible plants and plant parts which store plenty of reserve food in themselves. The parts may be the whole herb, excepting the roots as in the leafy greens; roots, like beetroot; underground modified stems or rhizomes, as in ginger; bulbs and tubers like onions and potatoes; and aerial stems and leaves as in greens; enlarged leafbuds as in cabbage; flowers as in the fleshy flowers of *Sesbania grandiflora* or even modified whole inflorescences as in cauliflower. Or, they may be fruits as in beans, gourds, brinjal and so on. They are all eaten cooked or raw in the form of salads and they form the base of a bewildering variety of dishes that the art of cooking has developed over

generations. Most of these vegetables are also very old as they have been cultivated by mankind for thousands of years and their origin as food plants is often lost in antiquity.

The actual food value of the vegetables however is relatively low, since they contain a great amount of water, as much as 7 to 95 per cent. Still, they are next only to the cereals (viz. rice, millet, wheat and the like) in the amount of carbohydrate, the main energy supplier for us. This is usually present in the form of starch but occurs occasionally in the form of sugar as in beet root and sweet potato or as pectins (a cementing material) and so on. Proteins, the chief body building material is rarely present in vegetables excepting in beans. The amount of fats, the third chemical constituent of our food, that the vegetables contain is also very slight. But the nutritive value of them is greatly increased because of the presence of the indispensable organic mineral salts and the vitamins they have in plenty. Another important aspect of vegetables is their roughage value which is due to a great percentage of undigestable cellulose that they contain. They form therefore a considerable bulk to our alimentary canal which does not act properly without the presence of such a bulk within.

Botanically, vegetables can be classified into three broad categories: earth or underground vegetables; herbage vegetables, or mostly greens; and fruit vegetables.

Underground vegetables comprise of all those in which food is stored within modified organs which may in turn be leaves as in bulbs of the onions and the garlicks, roots as in carrots and radishes or stems such as the rhizomes of ginger (which however is more a spice because of its strong odour) or the tubers (as in potatoes and yams or dioscoreas) or the corms (as in *Amorphophallus* or *suran* in Hindi). These are all specially adapted for storage because of their very protected position as well as the structural changes they have undergone. Many wild as well as cultivated plants have such fleshy underground parts and these have always played a considerable role in human civilisation and culture that has been next only to the cereals and the pulses. From the days of antiquity they have served as foods to man and animals. For tribals and the forest dwelling sages they have formed a staple food. Even now a tribal can easily hunt for them and secure many such edibles from the ground, which are still not even known to the Civilised World and much less appreciated.

The amount of the stored food material here is however much less than in the dry fruits and seeds which are rather concentrated food stuffs. Still, they are extremely valuable as they are readily digested and have a high energy content. A drawback is their great water content which reduces the amount of the available food material in them and also reduces their keeping quality. Their bulk in addition, comes in the way of their

easy and efficient transport unlike as in cereals, pulses and nuts.

But the root crops as the underground vegetables are more popularly called, form an important aspect of the agriculture of a country. Some of the common root crops of our country are: sweet potatoes, carrots, radishes, turnips, yams or dioscorias and tapiocas. Potatoes, onions, garlicks, colocasias and amorphophallus are among the stem crops. Potato and tapioca contain large quantities of starch and in times of scarcity they can and do serve as partial *substitutes* for even cereal food. Tapioca consumption in Kerala for instance is very great. Even normally, a Keralite uses tapioca in numerous tasty ways. Roots and tubers are no doubt poor source of protein and fat. But they are fairly good sources of minerals such as calcium and phosphorus. Potatoes have useful amounts of Vitamin C. Roots and tubers add variety, bulk and relish to our diet.

Herbage vegetables have their food stored in the aerial parts, for instance in the fleshy and well developed leaves and the succulent stems. Greens, salad plants and pot herbs are the examples. The chemical composition and the food value of these are rather close to those of the underground vegetables. But there is still more water and a correspondingly smaller amount of carbohydrates viz. starches and sugars. They contain more proteins specially in the leaves where they are manufactured and a considerably large amount of

mineral salts and vitamins. It is these latter that make them very valuable foods. They are also important because of their appreciable roughage value, the greatest among the vegetables.

The variety of green leafy vegetables available in our country is quite bewildering. It must be appreciated in addition that the forest dwellers even now know quite a few of such herbage vegetables which are just unknown to the civilised world. There are many *leafy vegetables* that are trees botanically and not herbs at all. Infact, there are quite a few such plants with us which are only used in some parts of our country and in not others though they are highly valuable nevertheless and also available everywhere. Two such examples are: drumstick leaves and the leaves of *Sesbania grandiflora* (*agati* in Hindi).

The greens are the cheapest among the protective foods that nature has gifted us. In general, the darker the green leaves, the greater is their nutritive value. Green leafy vegetables are rich sources of carotene, riboflavin, folic acid, Vitamins C and K, iron and calcium. Because of their high fibre content, they have good laxative properties. As their energy content is low, obese persons are advised to consume them more, so as to cut down on their energy intake. But in using them as food, prolonged cooking and cooking in open pans should be avoided so as to preserve their full nutritive value.

Fruit vegetables are botanically fruits. But they are rarely eaten in the raw state. They are not allowed to fully ripen on the plant, but usually plucked when well grown or even when they are still rather tender. They are mostly consumed after cooking, except however, when they are used as salads as in cucumber. They are thus used mostly like other vegetables for cooking; their food value and other properties also resemble other vegetables. There is a great many variety among them and they are usually good sources of vitamins and minerals. They also should not be cooked too much or in open pans. Both the greens and the fruit vegetables should be thoroughly washed and then only cut where required; they should not be washed after being cut. Otherwise there will be great loss of the vitamins and the equally valuable juices. Some of the common fruit vegetables of our country are the numerous varieties of the gourds such as ash gourd, bitter gourd, snake gourd, bottle gourd and also cucumber, lauki, among the climbers and so on. Bread fruit and the jack fruit are among the big tree vegetables. Brinjal, lady's finger, tomato and so on are the other common fruit vegetables.

Of the plants mentioned above, the greens and the gourds have been dealt with in this series in two separate books. It is only a few of the root and the fruit vegetables that are discussed here.

An important aspect worth being given due consideration is that, apart from being valuable articles of food in cooking, almost all of them do

have some medicinal value or the other also. There is a general dictum even in modern times now that our food itself can often be used to cure many diseases. This idea is being designated as Food Therapy in some quarters. Attempt will be made to highlight this aspect also in the examples selected. A significant detail that we should never ignore is the existence of many related species in India to most of our selected group of plants of any value, food or medicine. It is necessary that we should appreciate these related plants. For, they serve as valuable additional materials which we have rather unfortunately neglected.

The specific plants discussed are: carrot, radish and sweet potato among the root crops; brinjal, tomato and lady's finger or *bhendi* among the fruit vegetables.

A healthful way of consuming vegetables in general is to take their soup cooked in steam, slightly salted and mildly seasoned and cooked with *tur dal*. This is a nutritious, healthy and highly appetising drink best taken before the meals, specially the heavy lunches. A still better way of taking vegetables is to clean them well and prepare their fresh juice in a raw stage and as a drink. This is becoming fashionable of late specially among those who are keenly health conscious. For this purpose, carrot is the most suited vegetable.

The following table constitutes a ready reckoner of the comparative value of the nutritional ingredients of a few common vegetables.

	<i>Proteins</i>	<i>Fats</i>	<i>Carbohy- drates</i>	<i>Mineral Salts</i>	<i>Calories (energy values)</i>
Potato	1.6	0.1	22.9	0.6	99
Sweet Potato	1.2	0.3	31.0	1.0	132
Radish	0.6	0.3	7.4	0.9	35
Brinjal	1.3	0.3	6.4	0.5	34
Carrot	0.9	0.1	10.7	1.1	47
Tomato	1.9	0.1	4.5	0.7	41
Lady's Finger	2.2	0.2	7.7	0.7	41

A. CARROT

In English it is carrot; in French Carotte Cutive; in German Karottl.

Ayurvedic authors include *grinjana* (its Sanskrit name) under *Kanda shaka varga* or underground edible vegetables like radish and onion.

Carrot is called *Daucus carota* botanically and belongs to the family Umbelliferae that includes such familiar plants like coriander and cumin seeds. It is a native of the Mediterranean region and Central Asia and has been cultivated for over 2000 years. It was known to the Greeks and the Romans and is now cultivated all over the world for its sweetish succulent roots, but often occurs as a weed with long tap roots which are not at all fleshy

and do not look like carrot at all. It is also considered indigenous to Kashmir and Western Himalayas where it occurs wild.

Names

In Sanskrit this is known as *shika mulam* (with root having a *shika* or a tuft of hair like leaves—a term that describes the whole plant very well) and *grinjana* (an ancient term).

It is *gajar* in Hindi, Marathi, Gujarati and Bengali; in Persian, *gazar*, *zardak*; in Arabic, *jajar*, in Telugu, *pita kande*, *gajjara gadda*; in Tamil *gajjara kilangu*; in Kannada *gajjare*, *kempu mulangi* (the red radish); in Kashmiri, *mormuj*, *bulmuj*. It is believed that the Arabic term *jajar* is from the Persian *gazar* which is from the Sanskrit *grinjan*.

Botanical Aspects

The plant is a *hispid* herb (viz. having strong rough bristles or hairs) with a characteristic single swollen, tap root tapering downwards from a flat base much like an inverted cone and hence called conical. From this base arises a rich tuft of equally characteristic very green, highly dissected leaves that are also edible like a salad material. It is usually a biennial, living for two seasons storing food in the first seasons and spending it at the next season when it starts producing flowers. Quite often however, it matures in one season itself

as an annual. The leaves are pinnately compound viz dissected well like the feathers of a bird.

There are numerous cultivated varieties of carrot now that differ in size, shape, colour and quality of the taproot and this is related to differences in the quality of the soil also. A deep sandy loam is best suited for carrot cultivation. It is believed that it was the wild variety of carrot with which alone the Sanskrit authors were familiar and called it as *grinjan*; its root is smaller but stouter than the cultivated carrot and white in colour, and not red. What is common everywhere however is the cultivated variety with its long orange red tap roots that are eminently edible. Most of the food here is stored in the outer cortical portion of the taproot. The central portion remains somewhat woody and fibrous and is sometimes unpalatable.

Carrots are eaten raw or cooked and are also used for flavouring stews and soups specially in Western Cooking. They are a valuable feed, raw or cooked, for the animals, the cattle also and particularly the horses which relish them much. The leaves and the tops are highly valuable as fodder specially in seasons of drought. Their yellow colouring matter, carotin is sometimes extracted and used for colouring butter. Carrots are rich sources of stored sugar also, very much like the beet roots. The leaves contain two bases—pyrrolidine and daucine besides an essential oil. It is said that some individuals develop dermatitis or skin inflammation on coming in contact with carrot leaves, specially when they are wet.

Medicinal and Other Importance

The parts used are the edible roots and the medicinal fruits and seeds.

The carrots of the yellow and the red variety consist of the following constituents in percentage.

	<i>Yellow carrots</i>	<i>Red carrots</i>
Water content	81.40	77.86
Fully dried materials contain		
Ether extract	1.72	1.12
Albuminoids (having nitrogen, the protein builder 1.23)	7.63	7.05
Soluble carbohydrates (i.e. the sugars)	74.96	73.60
Woody fibres (the unpalatable part)	6.56	10.52
Ash (sand or silica 0.48)	9.08	7.71

The edible roots contain the following valuable substances: carotin and hydrocarotin, as the vitamin sources; sugar and starch, as the food; pectin, a cementing jelly like material which is also a good food; malic acid; lignin (the fibre); albumen; extractives, salts and a volatile oil. Fruit also contains a volatile oil and in addition a fixed non-evaporating oil. Carrots are exceptionally rich in iron, a small proportion of which is entirely precipitated out by boiling. Vitamin A results from carotene, a substance that is abundant in carrots.

In fact, this substance itself is called carotene as it abounds in carrot.

An interesting incident connected with carrot is recorded. In the great city of Peking in China it was announced in 1556 A.D. that there were vacancies in the Imperial Academy of Medicine. Selection examinations were held in which folk healers or recognised physicians could submit their divine remedies to promote youthfulness from within or rejuvenation. One Li Shin Chen, of the Great Bear said to have no equal to himself, proclaimed that a key to such youthful digestion was to have cleaned kidneys and maintain a youthful bladder function. His prescription for the kidneys and the adjourning parts was as follows: Chop and dice raw carrots, use the carrot tops also similarly. Place them in a kettle, fill with water and boil. Let this stand till it becomes cool. Sip "a goodly protion of it" before each of your three daily meals. This puts energy into the kidneys and vitality, the bladder and the connected parts. Peking royalists felt "reborn" by this advice and immediately awarded the coveted post to him. Li Shi Chen explained that certain ingredients (now identified as vitamins and minerals were liberated by this boiling resulting in an "immediate remedial and youthful joy").

Modern medicine amply recognises the beneficial influence of carrots on kidney. It is therefore much recommended in dropsy (a morbid collection of water in the body). It is also known to prevent the brick red sediment that is sometimes found in the

urine. Carrots are good cleansers of our blood. Carrot is a good antiseptic also and prevents putrefication or rotting changes that may take place in the body.

Seeds of carrot are aphrodisiac stimulating the urge of sex and they are also tonics to the nerves and invigorative to mental functions. Seeds are aromatic, stimulant and carminative (i.e. capable of expelling gases in the bowels). They are employed with benefit in the diseases of the kidney and also to cause abortion. Extraction of seed oil is much practised in France. This is yellowish, pleasant and smells like carrot itself; it is volatile and pungent in taste.

The full constituents of the carrot are as follows (the values are all given in percentage); water or moisture 86.0, protein 0.9, fats 0.1, carbohydrates 10.7, fibres 1.2, mineral matter 1.1, calcium 0.08, phosphorus 0.03; iron 1.5 milligram per 100 gram; International units (INU) of Vitamin A, is 2000 to 4300 per 100 gram, Vitamin B 60 INU; Vitamin C 3 milligram per every 100 gram and in the vitamin B group, thiamin is 56-101 per every 100 gram, riboflavin 50-90 and nicotinic acid 0.56-11 milligram.

If raw carrots are eaten only 20 per cent of the carotene enters the body. But, if the carrot juice is extracted and drunk, the full benefit of Vitamin A can be secured. That is why dieting by carrot juice is a very healthful habit. Carrot juice is the best among the vegetable juices that are nowadays

prescribed and served in the fashionable health clinics along the Mediterranean coasts. This juice cleanses the body, rejuvenates, freshens up, purifies the blood, kills the pesticides and other harmful foreign materials that have entered the body, frees the tissues of the body from their internal toxemia (blood poisoning) and undoubtedly puts the kidney functioning in an efficient gear. The beneficial effects of carrot juice are so many.

Carrot juice is very good for the patients of tuberculosis and also of gout who are also advised to eat carrot raw, grated if needed when they cannot digest it easily otherwise.

Carrot juice is added to the milk and given to the infants in order to guard against any infection. Carrot cures urinary stones effectively.

Carrots are well known for sharpening vision. For this purpose however they should be eaten raw. Patients of liver complaints would be largely benefitted by a liberal use of carrot.

The latter activates sluggish livers and prevents the accumulation of any foreign matters and blockages in the system.

A very delicious, simple and popular sweet dish is prepared in India known as carrot *halwa*. To prepare this, carrots are grated and then slowly boiled in milk till they thicken. They are then fried in a good quality ghee and to this is added a fine sugar syrup. This is kept simmering till a

homogenous and thickened consistency is obtained. Just before taking out from the stove, almonds, cashewnuts, pista and cardamom powders are added. This *halwa* is very good in restoring nerves and to invigorate mental faculties. This is particularly praised much in Punjab.

Carrots are rich in Vitamins C and A. Its solid food matter is about 2 ounces in pound. The calory or the energy supply value is 53 in raw and 36 in cooked state as seen in a 4 ounce of the material. Some however consider the caloric value to be as high as 90 calories per pound.

In the middle ages of Europe seeds of wild carrots were regarded as a specially efficacious remedy for jaundice.

In Punjab the seeds are considered as aphrodisiac. They are also employed in the shooting pains of the uterus. In Konkan regions they are actually employed as aphrodisiacs.

A decoction of carrot is highly reputed as curative of jaundice. This is particularly so, in Europe.

On burnt and scalded regions as well as vitiated ulcers well grown carrots are applied. Here, raw, rasped carrots are made into an ointment with lard and is then utilised.

Fresh carrots are grated and made into a good poultice for foul smelling ulcers. Some advise the use of carrot in old and chronic dysentery. Fruits of carrot are recommended for chronic diarrhoea.

Raw carrots should be thoroughly cleaned and washed. They are then best eaten raw in which state they also cure worm infections. They are eaten with relish as salad material when they are grated, salted and seasoned with mustard, green coriander leaves and shredded coconut. In this state carrot is eaten all by itself or still more tastily along with other salad materials like raw cucumber, tomato, onion, cabbage and the like—all chopped fine. Carrot is also commonly cooked and eaten in many dishes like other vegetables. They are also pickled. The pickle is prepared by boiling the roots and adding salt, mustard seeds and chillies. However, this will keep good only for a month or two.

The roots of the coarser variety or of the wild variety are sometimes dried and ground into flour and then eaten with whey or milk.

Much modern experimental work has shown that the reputation of carrot seeds as abortifacient is rather justifiable.

Carrot has a very praise-worthy place among the nutritionally valuable vegetables; it contains most vitamins and is particularly rich in Vitamin A. In promoting healthy development of the body and in developing appreciable capacities of disease resistance there is no other vegetable like carrot. Its use has been proven to be efficacious in curing the diseases of kidney and the heart as well as the stomach and the intestines. Specially for the vegetarians who do not use meat and fish, carrot

proves a profitable substitute. But it is important to note that eating carrot raw is always preferable.

Yunani Opinion

Yunani physicians consider carrot as hot of the second degree.

According to them, eating carrot produces a sense of well being. It strengthens the head, acts as an aphrodisiac, expels phlegm from the lungs and stimulates urine production in the kidney. Carrot is nutritious, cooked or raw, but too much of eating carrot is likely to prove constipative.

A pleasant but effective preparation suggested by them is as follows: Cook the carrots in warm or roasted sand (*bhubhal*), cut them into pieces, keep them in a vessel exposed to dew overnight, add in morning the distillation essence of *keuda* (*Pandanus* flowers) for fragrance and sugar candy for taste and then eat. This is advised to be good for palpitation of the heart.

As it expels phlegm and provokes urination carrot is used beneficially in cough, breathing difficulties, burning sensations during urination, and stones in bladder and kidney.

Carrot is a favoured material for preparing *murabba* (confections), *halwa* and distillation products (*ark*). All of these offer a delightful sense of well being and are also highly nourishing.

The drawbacks of carrot are: they are rather heavy and therefore digested somewhat slowly.

The seeds of carrot are third degree hot and first degree dry.

They are diuretic (promoting urination), emenagogue (regulating menstrual cycle), cleaning to uterus and abortifacient (i.e. causes abortion of the foetus). This also destroys stones in the bladder and the kidney and takes away shooting pains of the back and the chest. It is ground into a paste and employed internally in flatulence (bloating of the belly due to gas), obstructed urination and ascitis (*jalodara*). This is sprinkled on foul ulcers externally. Seeds are more aphrodisiac than the carrot roots. An interesting medicine suggested is: to take equal parts of the seeds of carrot and turnip, place them in a scooped out hollow of a radish, close the opening of this radish and cook it well in heated sand. Consuming this will expel the stones of the kidney and the bladder and promotes normal urination henceforth.

Ayurvedic Opinion

Ayurveda considers carrot as sweet, pungent and slightly bitter in taste. It is hot, stimulative, appetising and astringent (i.e. contractive to living tissues and hence aiding in healing). It wards off flatulence, thirst and shooting pains. It is employed beneficially in cases of plethora (*rakta pitta*), piles and worm infection.

The wild carrot is pungent, hot, stimulative, appetising and good for heart. It destroys foul

smell and is beneficial in the disease of *kapha* and *vata* and also splenic enlargements.

The seeds are hot, aphrodisiac and abortifacient.

Charaka the great Acharya of Ayurveda has the following specifications for carrot:

In shotha (swellings): The vegetable of carrot is extremely wholesome to patients of *shotha*.

In breathing difficulties and hiccup: Rub a carrot in water and let the patient snuff this as a nasal medicine. It is beneficial for the former and stops the latter.

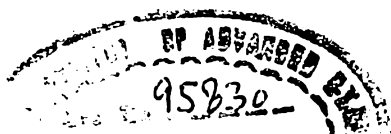
In piles: Cook carrots in the sour curd and pomegranate and with ghee or oil. This is a very useful dish for a patient of piles.

In highly bleeding piles: Consuming carrot in the cream of the curd is advised.

In dysentery: A soup of carrot is to be drunk.

It is curious to know that while Charaka gives extensive references to carrot, even its name does not occur in Susruta, an equally famous ancient Ayurvedic medical authority.

A variety of carrot: In Punjab there is a "variety" of carrot known as *pahadi carrot* or Hill carrot. Its root is regarded as aphrodisiac and a nerve tonic. The seeds are also medicinal. But botanically this is an altogether a different plant called *Eryngium*.



Caeruleum Bleb. This plant belongs to the same family of umbeliferae. This is a much branched 'ragrant plant. Its aromatic leaves are used like green coriander leaves to flavour cooked rice and *cuddy*. There are many varieties here which are favoured garden plants because of their graceful appearance and attractive colours.

Some Tips for the Best Use of Carrot in the Kitchen

Carrot is a vegetable that offers a desirable strengthening to the body. Eating it raw rather than cooked is always more profitable. Raw carrot chopped or grated may be employed to prepare many tasty dishes such as pickles, salads, *koshimbirs* and *patchadi* among the savouries. Cooked carrots are utilised to prepare *halwas* and *murabbas*. Fresh juice of raw carrot itself forms an invigorating drink as such or along with a little lime and salt. One can also prepare a welcome *sherbat* from out of carrot juice.

Eating a tender carrot raw daily after meals will remove the foul smell of the mouth completely. This will also destroy any disease causing germs that may be harboured in the mouth cavity. Teeth will get cleaned, risk of the dental caries is avoided, gums get strengthened and the bleedings at the gums if any could also get stopped. The food taken in will get digested well. Constant consuming of carrot will ensure freedom from diseases of the digestive system. Indigestion is definitely avoided.

A very good salad is a mixture of grated carrot, chopped onion, tomato and cucumber—all seasoned together and salted to taste. Grated carrot and soaked green gram, seasoned and salted similarly is a very tasty and wholesome *kochimbir*. Eating this will keep the body cool and the risk of constipation is fully warded off thereby. Salads of raw carrot are most salutary to the health and protection of the eyes; it is best to make a habit of eating this at regular intervals.

Grate well grown carrots as you would grate a coconut. Add to these gratings lemon juice and honey. Keep consuming this regularly. This is a good and a very beneficial measure in many diseases such as those of nervous system, liver, kidneys, lungs and heart. This also confers a considerable power of disease resistance.

A *sherbat* of carrot is prepared as follows: Grate carrots in a sufficiently large quantity and keep the gratings in a large sized stainless steel vessel. Add adequate amount of sugar, mix well, pour some water after half an hour, squeeze the carrot gratings well and filter. Add to this water some amount of lemon juice and again add sugar if felt needed. This forms a very strength giving carrot *sherbat*. It proves beneficial in cases of cough, asthmatic complaints, rheumatic pains and obstructed stools.

The *halwa* of carrot increases the seminal content. It also acts as an efficient aphrodisiac.

A very effective measure of deriving maximum benefit from carrot is to drink a cup of carrot leaf juice to which a teaspoonful of lemon juice and a pinch of salt is added. This is more beneficial than eating carrots as such. One cupful of such a juice will offer to a person vitamins A, B and C as well as calcium and iron—all in a quality that is adequate to him for a day. It is therefore absolutely essential to note that discarding the leaves when you purchase carrots from the bazaar is a very wasteful and a foolish step.

B. RADISH

Radish known technically as *Raphanus sativus* D comes under the family Cruciferae, to which a number of very familiar plants such as mustard, cabbage and cauliflower belong. This is a native of Central Asia but is now grown all over the world for the sake of its much esteemed edible tap root with its characteristic pungent flavour. Radishes have been cultivated by man for over 2,000 years if not longer but are still close to their ancestral type and therefore often revert to their original form with a dry woody root. Because of such an intensive cultivation and selection, innumerable horticultural varieties occur that differ among themselves greatly as regards their size, shape, colour, texture and even the aroma - for, there are some recent varieties which are fleshy, eminently edible and also have much keeping quality and are thus easily transportable but lack the unique flavour itself of the typical radish. Moreover, it

seems even the ancient Ayurvedists were aware of some of the varieties. For, they do refer to *bala mulaka* (which may very well mean tender and small variety, something like the table radishes of modern times) and also *hastidanti*, an Elephant's tusk which we have every reason to believe must have referred to a big sized white elephant tusk like radish. A modern typical example of the latter is Jaunpuri Radish of the fertile Gangetic soil of Uttar Pradesh, which grows to a truly gigantic size. For, one such radish constitutes an enough load to be carried by an adult man on his shoulders! There are early summer and winter types and they are also often forced to grow in hot beds like mushrooms. Radishes are eaten raw or cooked and they form favourite article of food in many countries including India. Besides their culinary value, they also have many medicinal uses. All parts of the plant are eminently edible - for instance root; the leaves which form a good salad eaten raw, nicely chopped and seasoned, or cooked as a curry; and, the flowers and the fruits that are delectable pungent vegetables highly delicious when tender. Unfortunately however the plant suffers because of many prejudices. Some people do not like its aroma and some regions consider using some portions of it as too uncivilised and crude. For instance eating the leaves of radish is not a favoured practice in Tamil Nadu and most people do not know at all that the tender fruits of radish are edible. Radish is a fine example of how a vegetable is utilisable in what is

known as food therapy viz. curing diseases by the very dietary articles one uses. This aspect will be highlighted in the account given below.

Names

Sanskrit calls this as *mulaka* referring to its root which is the edible and the most important part of the plant. Most regional languages of India call it by terms closely allied to this name. It is interesting to note that the English term "radish" also comes from the Latin term "radix", meaning root. English calls our radish as Indian Radish, Garden raddish or Long podded radish.

This is known as *mulī*, *mural*, *mura* in Hindi; *mula* in Marathi, Bengali and Gujarati; *muro* in Sindhi; *mullangi* in Kannada, Tamil, Telugu; *mulo* in Konkani.

Botanical Aspects

This is an annual or a biennial herb with a fleshy single tap root that is edible and a tuft of large *lyrate*, simple but lobed leaves that form a clump at the root level and are therefore considered radical. *Lyrate* means like a lyre—a musical instrument of the Greek. The leaf has a thick prominent midrib on either side of which spreads the leaf blade evenly but rather lobed into many sections, the size of these lobes gradually increasing upwards and there is a single huge lobe at the apex. The plant does not produce any aerial, visible and branched stem as in most plants.

Instead, at the time of flowering a single, much branched inflorescence shoots up from the clump of the radical leaves. The plant should be however harvested well before the flowering commences; for, the food stored in the tap root becomes spent during flowering and the radish would now become eminently unedible. Flowers are pretty, small, cross like, mostly white and they are followed by a crop of green, elongated, rather chilly like fruits or pods that bear small, rounded, brownish red, hard seeds.

The plant is cultivated and familiar all over India.

The parts used are: the root, the leaves, the flowers and the fruit-all, as edible vegetables of the kitchen. The fresh juice of radish root and the seeds are used in medicine.

Radish in Food and Medicine

Once, a cargo ship of Japan was making its way in the vast pacific ocean, laden with fresh fruits and raw vegetables for transport. In the middle of the journey, many of the sailors developed severe stomach pains. Soon the captain was also struck down similarly. In this calamity some one among the crew remembered that one of his revered ancestors had praised radishes with their green tops as a divine palliative to painful stomach-ache. All of them started munching on the radishes of the cargo. And, they experienced merciful relief almost immediately! An ancient folk healer had come to their rescue in this way.

This however is only one of the many virtues of the familiar radish.

Radish contains Vitamins A, B and C and also calcium, phosphorus and iron in appreciable measures. It promotes the hunger remarkably and aids considerably in warding off intestinal lesions and lessening obesity. Eating the leaves of radish is promotive of good urination and is thus a good guard of health. It is a good habit to include radish in our diet as frequently as possible. This is in fact a good prophylactic i.e. a preventive measure against falling ill.

Radish is a much acclaimed preventive and also cure for stones in the kidney or the bladder. Radish syrup pounded with cane sugar is highly recommended to secure relief from rheumatic pains. It is a ready remedy to cure bronchial or wind pipe troubles, specially the common whooping cough in our children. A highly commended procedure for whooping cough is to administer radish juice mixed with honey.

Eaten raw before the meals, radish improves appetite and increases the digestive power.

In some regions of Northern India, people make it a habit to take raw radishes for eating after taking meat. It is said that this aids in digestion of their heavy diet. The sturdy peasants of Rajasthan often take radishes (very much like onions) along with their millet-rotis and this is followed by a drink of butter-milk. Eating raw radish after the

midday meals is quite common in North India. This wholesome habit is unfortunately not so prevalent in the South.

But it is necessary to know that too much of radish eating is better avoided. This is likely to hasten a decaying of the teeth. Like the potatoes, the radishes are very useful in curing the corns or callus like formation common at the feet. A drop or two of the radish juice will heal it. If the pulp and juice of radish is applied on carbuncles it is said that there is no remedy better than this for the purpose among the vegetables.

Constituents

Fresh radish contains 91.00 per cent of water. Nutritionally it is important to note that radishes are better *cleansers* rather than *nourishers*. The completely dried radish has ether extract 4.00 per cent, albuminoids 18.00 per cent (in which nitrogen is 2.88 per cent), soluble carbohydrates 52.66 per cent, woody fibres 9.34 per cent, and ash 16.00 per cent (in which sand or silica is 0.33 per cent). Seeds and roots also contain a fixed, non-evaporating oil and a sulphur containing volatile oil very much resembling mustard oil. This oil also contains phosphorus and phosphoric acid.

Seeds and leaves are both diuretic *viz.* they provoke profuse urination and thus cleanse out the constitution. Seeds are also regarded to be possessing *emenagogueic* properties *viz.* they regulate menstrual cycle among women and are therefore used in the related disturbances.

Juice of fresh roots is regarded as a powerful antiscorbutic drug viz. one which counteracts the onset of scurvy.

Seeds are used in gonorrhoea and given in a dosage of one drachm at a time.

Root is a reputed medicine for piles and also the pains of the alimentary and stomach regions. This is also given in urinary and syphilitic complaints and relieves one of the dysfunction in urination and also the urinary stones and gravels. Juice of radish is given and also repeated beneficially as often as necessary for this purpose.

Tender and young radish fruits besides being a delectable vegetable for preparing curries, are recommended diet for patients of fistula in ano specially when they do not have any fever.

Leaves are boiled as a pot herb like any other leafy vegetable or greens, or used raw as a salad. In both ways it is a beneficial article of diet. Juice of the leaves is also given, dosage here is 1/2 to 1 drachm while the dose of the infusion of the seeds (1 in 10 parts of water) is 4 to 6 drachms.

Yunani Opinion

Yunani physicians regard radish as hot of the first degree and dry of the second degree.

They consider that eating raw radish after meals will aid the digestion of the latter no doubt. It promotes hunger also much but is it itself digested rather slowly - that is why belching of radish

continues to come quite for some time later and this belching has the characteristic radish smell.

The leaves of radish have very strong power of promoting profuse urination.

The pods or the fruits are also heavy for digestion and are astringent (i.e. contractive for living tissues and hence healing).

An ash or alkali (*kshara*) prepared by burning the leaves and the roots of radish is a good medicine that will open out blockages in the body, regulate alimentary function (by being also a laxative) and is diuretic. This is beneficially employed in urinary stones in bladder and kidney.

Eating cut raw radishes along with vinegar is advised to be good for splenic enlargement.

Raw radishes subside enlargements at the anus, calm down the pain and dry up the fluids. The leaves along with their many other useful properties may also be used to cause vomiting when they will expel vitiations of cold.

Drugs for piles are often given as pills dipped in radish juice. Another use of the fresh juice is as follows. Add to such a juice, mustard oil in one fourth of the former's quantity and then cook on low fire till the water portion is evaporated and only the oil component remains. It is then cooked, strained and stored. This is used as an ear drop in cases of earache and ear inflammation.

The juice of the leaves is mixed with sugar and given with benefit to patients of jaundice. It acts effectively as it is a good diuretic. Because of the same reason it is a useful drug in ascitis or *jalodara* where morbid water gets collected in the belly.

Its use is rather unwholesome to head, throat and teeth. Cumin seeds (*Jeera*) and salts are the agents to counteract its deleterious effects.

The seeds of radish are hot of the second degree and dry also of the second degree.

The external application of the seeds is for scarifying (*lekhana*) but when used internally, they are emetic (causing vomiting), diuretic and regulatory being slightly laxative to the alimentary tract. They are diuretic and promotive of menstruation and much employed to get rid of the shooting pains due to swellings and to increase the general strength of the body. Seeds are boiled and given to cause an expulsion of phlegm in phlegmatic diseases. They are employed to provoke urination and destroy *vata* aggravations.

In cases of deformities, freckles, warts and blotches on the skin the seeds are ground into a paste alone or with other useful drugs.

The drawbacks of using seeds of radish is that they are rather agitating. Cumin seeds, salt and honey are the counteracting agents.

Ayurvedic Opinion

Ayurveda categorises the nutrition potentialities of radish very analytically.

The tender radishes are bitter and pungent in taste, good to heart, appetising and stimulating. They destroy the aggravation of all the three *doshas* and are good for the voice and light for digestion. But the full grown radishes are heavy for digestion, rather constipative, causing noises in the intestine. Strong smelling, mature radishes should not be eaten raw at all; they should first be cooked, otherwise they aggravate all the three *doshas*. But when these radishes are eaten cooked well with oil, they are actually curative of the *doshas*. Dried radishes are also curative of all the three *doshas*, counteracting to poison and light for digestion. Infact, apart from radishes, all dried vegetables are constipative and promotive of *vata* dosha. The flowers, the leaves and the fruits are increasingly heavy for digestion in this order. The flowers of radish overcome *kapha* and *pitta* while the fruit overcomes *kapha* and *vayu*.

In fine, the tender radishes remove the aggravation of all the three *doshas*; old and well grown radish causes the aggravation of all the three *doshas*, while the radish cooked with oil removes *vata* and the dried radish removes both *kapha* and *vata*.

Modern medicine considers radish as of hot virility. Fresh leaf juice and seeds are diuretic, regulatory and destroy urinary stones. Chronic

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constipation responds well to a daily diet of radish. Leaf juice is administered in stomach pain, belching and piles. Three grams of seeds are powdered and given in absence of menses.

The following is a list of medicinal uses of radish selected from a few famous classical authors in Ayurveda.

From Charaka

Dry Piles: Induce a sudation by a fomentation with dry radish.

Piles: Prepare a soup from dried radishes and give this as a drink.

Dysentery: Soup of radish is advisable.

Glandular, Painful and Red Swellings or Visarpa: Apply a heated paste (*kalka*) of dried radish.

Swellings due to kapha: Sprinkle heated juice of radish.

Hiccup and breathing difficulty: Give a soup of dried radish for drinking.

Cough due to vata: Radish used as a vegetable is salutary.

From Sushruta

Ear ache: Use warmed radish juice as an ear-drop.

From Chakradatta

Fever due to kapha and vata: Soup of tender radishes is wholesome.

A type of leprosy called *sidhma kushta*: Seeds of radish are to be ground in freshly extracted juice of *apamarga* (*Achyranthes aspera*) and applied.

In *Sheeta pitta*: Always give a soup of dried radish along with the meals.

From Bhava Prakasha

In *visuchika* - cholera: A decoction of raw radish is to be given mixed with a powder of *pippali*.

From Shodala

In swellings of all types: Give radish along with oil.

Varieties of Radish

The common India radish is larger and coarser than the English radish plant, and is eaten both raw and cooked.

There is a very distinct variety of radish which is botanically called *Raphanus sativus* var. *caudatus* Linn popularly called in English as Rat-tail radish or Java radish. This is widely grown in Northern India and specially Gujarat where it is known as *moagri*. The long whip like purple pods of this radish often reach a length of 2 feet or more and

are eaten raw or cooked. The seeds of this plant were believed to have been introduced to India from Java.

Apart from this, there are very many purely cultivated varieties of radish differing in the size, texture and surface appearance as well as the keeping quality. A red skinned coarse and much stouter variety also exists. All are much popular vegetables of the Indian kitchen.

Jaunpur variety technically called *Raphanus sativus* (Jaunpuri) reaches really enormous size—a length of 75-90 centimetres, girth of 50-60 centimetres and a weight of 5-15 kilogram or even more! It is said however that it thrives thus only in the local brackish or salty soil and when grown elsewhere it does not reach this gigantic size.

Radish is said to be refreshing and depurative or purificatory. Its preparations are useful in liver and gall bladder troubles. In homeopathy they are used for neuralgic headaches, sleeplessness and chronic diarrhoea. Roots, leaves, flowers and pods are active against gram positive bacteria. The roots are beneficial in urinary complaints, piles and gastrodynia. A salt extracted from roots dried and burnt to ash is presumed to be used in stomach affections. The juice of fresh leaves is used as diuretic and laxative. The seeds are peptic, expectorant (causing cough), diuretic and carminative (expelling stomach gases).

Leaves are highly nutritious, particularly rich in calcium, iron, ascorbic acid and are considered to

be one of the richest sources of vitamin A among the leafy vegetables. Taken with rice it is a very good nutritive supplement. They also have a high content of strontium; and also iodine and ascorbin. Radish leaves are infact good source for commercial extraction of proteins. They can be actually used to supplement protein deficiency.

Seed cake from which oil has been extracted is also rich in protein. It is a good manure as well.

Tips for the Best Use of Radish in the Kitchen

Radish is a digestive vegetable. Taking a *patchadi* or curds mixed with raw or mildly fried pieces of radish and seasoned, along with meals is a good measure to ensure digestion of the food taken. The same effect is possible by eating raw radish after the meals.

Eating radish raw is advantageous. For, cooked radish is likely to lead to gas formation in the stomach.

Radish proves very beneficial in the diseases of eyes, ears, nose and throat. It is essential that these patients should consume radish. A good way of taking radish is to do so in a raw state along with *roti* or *chapatti*. Or, mix the gratings of radish with the flour itself and then prepare *rotis*, *parathas* or *chapattis*.

Consuming a *kochimber* of raw radish at frequent intervals will prevent chances of getting affected with common cold and the running nose.

Eating pieces of raw radish mixed with pepper powder, salt and lemon juice proves beneficial to patients of indigestion, constipation, dullness of vision, piles and jaundice.

Radish is not advised to be eaten on a hungry stomach. Too much cooked radish is also advised not to be taken.

Patients of piles would find it very beneficial to eat raw radish in abundance.

Grind radish and salt into a smooth paste. Apply this to the region of scorpion sting. The venom will not spread. Very soon the burning will stop and then pain will also disappear within few minutes.

The green leaves of radish should never be discarded. They contain very many nourishing components. One can prepare a delicious curry out of them, which is quite healthy. Clean these leaves well, grind and extract the juice. Taking this juice is a sure cure for obstructed urine.

A teaspoonful of the seeds of radish is to be ground into a smooth paste. This is to be mixed well with buttermilk and then drunk. This will commence menses that had become obstructed. Their paste can be applied with benefit in curds or lemon juice to many skin diseases such as ringworm and psoriasis.

Cut a radish into small pieces, add pepper powder, lemon juice and salt. Take this in as a salad. It would act as a counteracting measure to indigestion.

For patients of piles of both the types, bleeding or the non-bleeding, dry variety, eating raw radish as well as the green leaves of radish, again in a raw state as a salad and doing so in great profusion is a must.

Crush the green tuft of the radish leaves and secure its juice. This juice when taken fresh is a very effective diuretic; it will lead to excellent urination quickly.

C. SWEET POTATO

Sweet potato or *Ipomea batatas* Poir as called botanically belongs to the family Convolvulaceae under which are included the many pretty garden flowers of Ipomeas and the famous ayurvedic medicinal plant Vishnu kranti or *Evolvulus arsenoids* Linn. This plant is included here because it happens to be one of those plants for which people have unnecessary prejudices. In spite of its nutritional excellence and useful medicinal values there is almost a food fad of not using this to the extent that it deserves—specially among the middle class and the higher class of our society. The latter neglect it as it is available very cheap and abundantly! It is necessary that they should be educated to use the plant more preferentially.

The plant comes from the New World or the Americas where however this was being cultivated for more than 2000 years, like the maize which also is an American gift to the World. This is a native of tropical America where it was first grown

by the Indians Centuries before the coming of the white man. But, by the beginning of recorded times itself it is known to have been cultivated widely in the tropical regions of both the hemispheres. This humble root crop has always been cheap and available throughout the year. It grows in every type of soil and is also actually grown in most gardens though nowhere on a huge and commercial scale, say, like the potatoes.

Sweet potato contains both sugar and starch in abundance and even a little fat. They can thus form a staple food, which they actually are in some Southern regions of the United States, where they are next only to the "white" or the usual potatoes. Sweet potatoes are common table vegetable there and are also used for canning, dehydrating, flour manufacturing and in addition, as a source of commercial starch, glucose syrup, and alcohol. They are fed to many domesticated animals—horses, cattle and hogs. The green tops of the plant constitute much favoured fodder to cattle. Its juice is fermented and used as a beverage. Several parts of the plant are thus useful. The one drawback with sweet potato marketing is that as it has a high water content, it spoils readily and about a third of the crop produced is usually lost in this way.

Names

There is no name in Sanskrit for this plant; this being a recent introduction to India. Such names like *kanda granthe*, *picchila*, *pindalu*,

svadukandaka are all recent coinages. The plant is just unknown to the ancient Ayurvedic works.

But many of our regional languages have a name for it, indicating its popularity among the common folk. It is known as *chire alu*, *lal alu*, *rangalu*, *lal shakarkandalu* in Bengali; *mithalu*, *shakar kand* in Hindi, Punjabi; *ratali* in Marathi; *genasu* in Kannada (interestingly Chinese name is *kanchu*) sounding quite similar; *chelagada* in Telugu; *sakkara vallikilangu*, *vallikalangu* in Tamil.

Botany

The plant of sweet potato is a twining and trailing herb that is mostly annual in India though in the United States they are perennial. The plant keeps spreading as it lies horizontally on the ground and develops adventitious roots all along that end in swollen tubers that constitute the sweet potato. The herb is mostly smooth and non-hairy or it may become only sparingly hairy.

Although the plant can be cultivated in any soil, it thrives best in sandy soil and a warm, moist climate.

Sweet Potato as a Food and Medicine

The tubers contain great amounts of starch and sugar, the two major components of our food as such. The fresh vegetable contains 68.00 percentage of moisture. The completely dried root contains ether extract 4.50 per cent, albuminoids 21.45 per cent (nitrogen in it being 3.43 per cent).

soluble carbohydrates (i.e. sugar etc.) 69.18 per cent, woody fibre 7.5 per cent and ash 3.12 per cent (of which, sand or silica is 0.12 per cent).

Since the tubers contain much fibres it is likely to ferment easily and thus provoke flatulence - viz. bloating of belly due to the collection of gases. It is mildly laxative also.

There are two varieties, the white and the red skinned. Of the two, the red variety is more nutritious.

The yield is rather low; agriculture scientists should try to improve upon it. More importantly an intense attempt is needed to evolve varieties of sweet potato that are fibre free. This is a very important need as fibre content is the one drawback of this highly nutritious and useful plant. Such an innovation would be a boon to the poorer class to whom it does form a staple diet or at least an essential ingredient in their food. There is a third variety called clustered sweet potato from Sri Lanka.

Sweet potatoes are used in the kitchen in the form of curries, *payasam* and many other dishes. When the flour of cooked sweet potato is well kneaded, and the fibres fully removed, it is made into balls, deep fried and then floated in sugar syrup much like *gulab jamuns*. Cooked sweet potatoes added with ghee and a sprinkling of sugar or mixed with jaggery or mashed with milk and sugar form the most favoured food for fasting days.

Dried tubers are sometimes ground into flour and this is baked into cakes which also constitute the prescribed food for the fasting days.

Sweet potatoes taste well and sweet when roasted in heated sand and eaten as such or with jaggary or sugar.

This is however a food that is likely to be constipative and also promoting of flatulence. But it is a much nourishing food that gives quite an appreciable amount of energy to the body.

It is very promotive of semen production and a good aphrodisiac, increasing the urge of sex.

The two principal benefits of sweet potato, apart from being a potential staple food, are its effective aphrodisiac value and the ability as an excellent promoter of mental vigour. The root is made into a *halwa* by frying it in ghee and adding sugar. Such a *halwa* is being given for eating and is quite an aphrodisiac and a strengthening dish.

The main drawbacks of sweet potato are that it is likely to lead to flatulence and also constipation, as noted above. But the two agents that can counteract these drawbacks are fresh milk and sugar. That is why sweet potato is advised to be taken mashed with milk and adding sugar.

Medicinally the paste of the tuber or the leaves of the plant is applied to scorpion bite with beneficial effect.

Ayurveda considers the root as sweet and cooling, aphrodisiac and useful in urinary stones, urinary discharges and also burning sensation and thirst. It causes *kapha* and *vata*.

Yunani physicians regard it as sweet and fattening. It stops diarrhoea but is bad for the chest and the lungs.

The roots are also laxative.

In Malaysia the root tuber is made into a drink to quench thirst during fever. In the Gold Coast or Ghana of Africa the leaves are ground with salt and applied to whitlow which bursts and heals in two to three days, because of this treatment.

D. BRINJAL

Brinjal, also called Eggplant is a very familiar, popular and native vegetable of India. Botanically this is *Solanum melangena* Linn coming under the family Solanceae to which the equally popular tomato and potato belong. This is also known as Aubergine in English and though it is indigenous to our country, it is widely grown in the warmer regions of both the hemisphere, specially in the West Indies and Southern United States in the New World. Because of intensive cultivation on an extensive area and for such a long time there are literally innumerable horticultural varieties among the brinjals. They differ from one another as regards the shape, the size, the external colouration, the texture, the keeping quality, the

taste and so on. The fruits in some varieties in the United States are of the size of a coconut! The fruit is generally large, ovoid, fleshy throughout with no hollow in the centre. The succulent plaental pulp in which the numerous flat thin seeds are scattered occupies the whole of the central core of the fruit. The plant is usually cultivated as an annual herb or freshly planted every year. The fruit is usually cut into slices, fried, or boiled or cooked. But the details of curry preparation of this vegetable are highly varied in accordance with the relish and the fancies of the cooks and the experts. A wasteful but supposed to be very delectable curry for instance is prepared as follows. Plants which have an ample crop of small blackish fruits are selected in the garden. The fruits are sliced to one fourth distance longitudinally with cuts that are mutually perpendullar. The cuts are gently spread out while the fruits are still intact on the plant and the required quality and quantity of *masala* are now stuffed in. A basin of cooking oil is heated now and this steaming hot pan of oil is held below every such plant whose fruits are stuffed with the *masala*. The latter get scalded and cooked by this heat itself and are then used as delicious curries. Of course along with the *masala* filled fruits the whole plant will also get scalded and would die. Another dish of delicacy very common in Gujarat specially, is a picknic dish or *undyā*. Here a large variety of fresh vegetables, the chief ones being brinjal, sweet potato and potato as well as beans are all placed in a fresh earthen pot, the lid is sealed and the entire pot is heated well in the

camp fire, so that the whole vegetable stock inside gets fully baked and cooked. The pot is broken, masala, salt and oil are added and the entire stuff forms a sumptuous and a tasty curry. Brinjal being a very favourite vegetable in the Indian kitchen its uses and the variety of choice dishes are simply legion.

Brinjal and tomato, both of which are very common fruit vegetables all over India belong to the family Solanaceae. This is a very extensive group and contains some of the deadliest poisonous plants like *Hyoscyamus muticus* Linn and *Datura fastuosa* Linn. The famous tobacco, *Nicotiana tabacum* Linn and also the potato, *Solanum tubersum*, come here.

Therapeutically i.e. in terms of their medical action the plants of this family are mostly narcotic (producing sleep or torpor); some are more or less acrid in taste and stimulating; others are tonic, diuretic and diaphoretic (promoting sweat formation).

Many important alkaloids - the active principles that are generally toxic but therefore medicinal when used in judicious dosage, have been found in the plants of this group. Examples are: atropine (used in dilatation of the pupil of the eye during its medical examination) and belladonnine, both from *Atropa belladonna*; capsicine from chilly, *Capsicum frutescens* Linn.; hyosciamine, from *Hyoscyamus muticus* Linn.; mandragorine, daturine from *Datura* and nicotine from *Nicotiana* and so on. Presence of

alkaloids leads to a bitterness of taste. It is well known that brinjals often become bitter in taste.

Names

This has many names in Sanskrit; *bhantaki*, *brihatti* (big sized, in reference to the fruit), *hinguli*, *kantakini* (the spiny, at the fruit base i.e. calyx), *kantataru* (spiny, all over the body), *katphala*, *kshudrabhanta* (referring to a minor variety), *vartaki*, *kshudravartaki* (referring to a minor variety), *vrintaki*, *vanavrintaki* (a wild variety).

It is Egg plant or Brinjal in English. Chamber's English Dictionary traces the term 'brinjal' ultimately to the Sanskrit term *vatingana* through Persian, Arabic and Portugese terms in between.

It is *baigan*, *begun* in Hindi; *begun* in Bengali; *badangan*, in Persian; *wangi* in Marathi; *vanga*, *vankaya* in Telugu; *badane* in Kannada; *kattarikayi* in Tamil; and *valutina*, *mulukutakali* in Malayalam. Most languages also have many names for brinjal, often recognising the many cultivated or even wild varieties therein, both of which are quite common in this plant.

Botany

This is a very common vegetable all over India, where the unripe fruit which is a typical fleshy berry is the edible part. The fruit is extremely variable in the details of the shape as well as colouration on the surface. These are all diverse cultivars or varieties produced by man by his

horticultural practices and selection of choice varieties over generations. The fruit is considered a typical Indian vegetable as it is very common all over India and enters in many ways in everybody's kitchen. It is widely cultivated here no doubt but the plant is not believed to be a native of India; in fact, its native country is not known exactly.

The plant is erect, herbaceous, closely covered with short prickles on the stem, the leaves and the calyx. In some cultivated forms, however, the plant is completely devoid of any prickles anywhere. Young parts have close soft hairs over them. Leaves are large, elliptic and the margin is wavy (sinuate) and sometimes lobed. Flowers are solitary or in small clusters branching dichotomously (i.e. as cymes) with only the lowest flower being fertile yielding the fruit, while in the wild forms, all the flowers are fertile and grow into fruits. Calyx (the cup like green structure below the flower) grows along with the fruit and becomes fleshy. The fruit is a berry which is smooth, shiny and variously coloured, on the surface and pulpy throughout with many seeds embodied everywhere. Even the size of the fruit is very variable, often very large in the cultivated varieties or even inordinately elongated.

Medicinal Properties

Primarily brinjal is a very popular kitchen vegetable. But it also has many medicinal uses as follows. The unripe fruit which is the vegetable is medically bitter, pungent and heating (*ushna*). It

improves appetite and enriches blood. It is also aphrodisiac viz. increases libido or the urge of sex and a cardi tonic, acting as a tonic to the heart. It is beneficial in curing the diseases of *vata* (though it is usually regarded as *vata* promotive) and *kapha*. Its habitual use increases *asthma* and bronchitis but does not cause biliousness or *pitta* aggravation. But the ripe fruit is known to cause biliousness though its use improves blood.

The root is applied to lessen the pain. Unani physicians consider the use of the fruit as being bad for piles when taken internally but beneficial if applied externally.

The leaves are used as narcotic as it produces sleep or stupor.

The seeds are used as a stimulant but their consumption is likely to lead to dyspepsia or indigestion and constipation.

Both the leaves and the fruits are used medicinally in Madagascar. They are regarded as promotive or stimulative of saliva flow in the mouth and are useful in toothache as well as in the skin disease of herpes. They are commonly employed in cholera, bronchitis, fever, dysuria (difficulty or pain in passing urine) and asthma. In Guiana, the juice of the root is used externally in earache and toothache. The Xosas tribals of South Africa drink a decoction of the root as a treatment for syphilis and also apply a paste of the leaf to the external manifestations such as sores and ulcers of this dreadful disease.

The fruits of brinjal are hypnotic (sleep inducing), constipative and aggravative of *vata*. The long variety is phlegmatic and is likely to lead to pthisis or consumption, cough and also a loss of appetite. Tender fruits counteract phlegm and alleviate wind or *vata*. Burnt i.e. scalded fruits are light in digestion, somewhat purgative but beneficial in phlegm and gas trouble; most importantly they are very good in obesity and therefore best suited for persons who desire to slim down.

Leaves of the plant are narcotic while the seeds are stimulant.

Fresh tender fruit which is how brinjal is best used as a vegetable contains the following: 88.26 per cent of water; the completely dried fruit has 4.20 per cent of ether extract, 16.37 per cent of albuminoids (with 2.62 per cent of nitrogen), 55.23 per cent of soluble carbohydrates (eg. sugars), 17.00 per cent of woody fibres, and 7.20 per cent of ash (with 0.70 per cent of sand or silica).

It is interesting to note that the green leaves of brinjal are the main source of antiscorbutic (i.e. scurvy destroying) Vitamin C.

The fruit is used in various ways in the kitchen. Often, it is fried or baked and then mashed and mixed well with curd and milk, salted and seasoned to form a delicious *raita*.

It is pierced all over with a needle and then fried in gingiley oil and used as a cure for tooth-ache.

Fruit is considered as an excellent remedy for persons suffering from liver complaints.

Seeds are likely to lead to dyspepsia or indigestion and constipation.

Brinjal is regarded as being useful in cholera and prolonged fever of the enteric group.

Yunani Opinion

Yunani physicians consider brinjal as hot and dry of the second degree.

This is astringent in taste and constipative in action. It alleviates swellings, dissolves oedema or fluid filled swellings and is specially stimulative. It is also a good mitigative of pain. The fruit is however often considered as not very wholesome because of its constipative tendencies.

The fruits are roasted in heated sand and tied as a poultice in a rather hot state itself. This is how it is employed in injuries in the body or to lessen down oedematous regions or dissolve them and to secure alleviation of pain. To calm down the distress and pain due to physical injuries, the water of brinjal fruit roasted in sand is mixed with jaggery and then drunk.

Ayurvedic Opinion

Ayurveda considers brinjal as bitter, pungent and sweet in taste. On being cooked it becomes bitter in taste, hot in virility, appetising, tasty and stimulative, light in digestion, promotive of semen

formation, strengthening and nourishing. It is good for heart. It is non billous and considered as being destructive of fever and also all the three types of the *doshas* but as a vegetable it is contraindicated to patients having *vata* diseases.

The raw i.e. very tender brinjal destroys *kapha* or phlegm and *pitta* or billousness.

Well ripened yellow brinjal becomes slightly alkaloid, causes *pitta* and is also heavy for digestion.

The medium sized brinjal is the best and this destroys the aggravation of the three *doshas* and is good for plethora or *rakta pitta*.

Brinjals baked or roasted directly on live coals is somewhat billous but stimulative and the lightest for digestion. They are also destructive of phlegm, excess of fat and *vata*. But they become heavy and unctuous when salted and mixed with oil.

Brinjals that are white like hen's egg are considered to be specially useful in piles, unlike the common variety.

Some Tips for a Good Use of Brinjal in the Kitchen

From the health point of view the violet coloured, long and tender brinjals are the best. They destroy *vata* aggravations and prevent the afflictions of phlegmatic troubles.

Dishes of brinjal are good in diseases of eye. They prove beneficial for a dullness of vision.

Some persons frequently suffer from excessive perspiration at the palms and the soles of the feet. They would find it beneficial to wash their hands and feet once in fortnight in water in which cut pieces of brinjal are kept soaking.

Prepare a curd *patchadi* from the violet coloured long brinjals. The method is to steam bake them or to bake directly on live fire till the external skin almost gets charred. Remove the thin outer skin and mash the whole pulp. Add this homogenously to curds and season with chillies, mustard and a little *hing* and add salt. This is a tasty dish. Taking it daily with meals is likely to overcome barrenness and confer an offspring.

Relatives of Brinjal

Brinjal is a very favourite vegetable all over India, though as usual many persons do have a fad of disliking and not using it to the extent it deserves. This is also often due to the fact that brinjal is rather a cheap vegetable much taken by the poorer class of the society. And, brinjal occurs in numerous varieties all over India, different regions claiming great merits of taste and delicacy for the varieties of their own region!

In Karnataka for instance two to three such famous varieties of great local reputation occur. They are: *gullada badane* the big sized bloated

variety, quite dark in colour; *shurpali* variety with a very tender and massive flesh on the banks of the River Krishna; *eranagere* or a Mysore variety with a thick generally green skin and of a great keeping quality; and *vaditraja gulla*, a greenish much seeded variety of Udupi area. Many such instances of local preferences can be given as regards brinjal.

In addition to the existence of such a richness of variety, there occur a large number of plants that are closely related to brinjal and coming under the same genus *Solanum*. Some of there are also good vegetables in their own way but not well appreciated. Three of these relatives of brinjal that are also vegetables are discussed below.

They are: *Solanum indicum*, *Solanum nigrum* and *Solanum torvum*. The other species of the genus do not constitute vegetables of the kitchen though they all have some medicinal value or the other and are actively employed so. All of these various species of *Solanum* are also quite common all over India. The most famous of these latter "purely" medicinal species of *Solanum* is *Solanum xanthocarpum* or *kantakari* (*bhumi ringani* or *katai* in 'Hindi') - a thorny weed very common all over India and much reputed in Ayurveda for its use in fever and cough. There is another species of the genus viz. potato, the most famous of the vegetables and technically known as *Solanum tuberosum*, but this is a tuber and not a fruit vegetable like the brinjal.

1. *Solanum indicum* Linn.

Names

Sanskrit calls this by a large number of names: *brihati*, *vrhati*, *bhantaki*, *rakta pati*, *sthula kanta*, *vana vrintaki* (the brinjal of the jungles) and so on.

Most regional languages also have many names for this plant, as it is quite familiar.

It is known as *tit bagum*, *titveguna*, *byakur* in Bengali; *mota ringni*, *vadaringni* in Gujarati; *barhanta*, *bhata kataiya* in Hindi; *dorli*, *ran ringni* (wild brinja) in Marathi; *kandyari* in Punjabi; *varttagi*, *struvaludalai* in Tamil; *badane*, *gulla*, *hebbagulla*, *kempuqulla* in Kannada; *chunta*, *cheruchunta* in Malayalam.

Botany

This is a much branched undershrub which is very prickley, prickles being large and with a compressed base, sharp and often slightly recurved. Leaves are ovate, with an acute apex, base is often heart shaped and unequal on either side of the midrib. The margin is rather wavy or with a few triangular-ovate lobes. The leaves are sparsely prickly on either side. The fruit is a berry of 8 mm in diameter, globose, smooth and non-hairy but sometimes with a few star like hairs at the apex. This is dark yellow when ripe.

The plant is widely distributed throughout tropical India, Sri Lanka, Malaysia, China and Philippines.

Medicinal Uses

The root is pungent, heating, digestive and healing to the bowels. It removes the foulness of the mouth and is beneficial in cardiac troubles. It is beneficially employed in leucoderma, fever, asthma, bronchitis and itchings at the anal region. The fruit is bitter, pungent, and useful in worms, leucoderma, bronchitis, asthma and also loss of appetite and diseases of the eye.

The leaf juice along with the fresh juice of ginger is administered to stop vomiting.

The leaves and the fruits are bruised with sugar and applied to get relief from itch.

In Madagascar the plant is considered good for stomach (stomachic) and fever. The fruit is a bitter stomachic and hypnotic - i.e. sleep inducing.

Both the fruit and the root contain wax, fatty acids and the two typical alkaloids of the family viz. solanine and solanidine.

The root forms one of the *laghu panchamula* or the minor five root drugs of Ayurveda but it is rarely used alone. It is regarded as diuretic, (promoting urination) and therefore useful in dropsy (collection of morbid fluids in the body). It is useful in cough and running discharge.

Vapour of the burning seeds is a remedy for tooth-ache, specially due to caries.

In cases of convulsions and epilepsy, rubbing its root in the nose will bring back consciousness.

There are two varieties here, the smaller and the bigger - *choti kateri* and *bada kateri*, the former being more preferred in medicine.

2. *Solanum nigrum* (the black) Linn.

Names

There are many names in Sanskrit, such as *bahuphala*, *gucchaphala* (as it bears many fruits in a cluster unlike the brinjal), *dhwanksha machi*, *kakamachi* (the crow - black plant, referring to the colour of the fruit), *kushthaghnri* (destroying *kustha*), *tiptaka*, *bahutikkta*, *sarva tikta* (much bitter, everywhere), *rasayani* (an elixir).

In English, it is Black night shade, Common night shade. It is *gurkamai*, *kabatiya*, *mako* in Hindi; *piludi* in Gujarati; *gurkamia*, *kakmachi*, *mako*, *tulidun* in Bengali; *gajuchettu*, *kachi*, *kakamachi* in Telugu; *kachihannu* in Kannada and *manatakkali* in Tamil.

Botany

This is found in India, Sri Lanka and all temperate and tropical regions of the World.

The plant is a variable annual herb. Stem is erect, smooth or with soft minute hair cover all over (pubescent) and much branched divaricately or forkingly. Leaves are many, smooth and thin, margin is uncut or entire, slightly wavy and gradually tapering into the stalk or the petiole below. Flowers are small and characteristically extra axillary i.e. rising a little away from the axil

or the angle with the leaf and directly as it were from the stem. Fruit is a small sized globe like berry usually purplish black, but sometimes red, or yellow, smooth and shining. Seeds are yellow.

Importance and Uses

This is a good culinary herb as well as a very widely and variously utilised medicinal plant. Unfortunately the culinary aspect is almost neglected. There are not many who use this vegetable as much as it really deserves.

The berries are oily, bitter, pungent and cause heating (*ushna*). They are laxative, tonic and diuretic i.e. promotive of urine flow. They improve taste and appetite in food and are useful, in the diseases of eye and heart, piles and leucoderma. They improve the voice, favour conception and also facilitate easy delivery. They are also regarded as being useful in erysipelas (*visarpa*) - an inflammatory disease, generally in the face and characterised by a redness of the skin.

Yunani physicians regard the seeds as laxative and also useful in giddiness, thirst, inflammation and in gonorrhoea.

The root bark is laxative and useful in diseases of the ear, the eye and the nose.

It is good for ulcers in the neck, burnings at the throat, inflammation of the liver, chronic fever and griping or a twisting pain at the bowels. This however should not be given for pregnant women.

A decoction from the leaves of the plant and also an aqueous extract from them is given with good effect in treating dropsical swellings due to collection of morbid fluids within the body. The action is diuresis. Dosage of the extract is in a drachm given thrice daily. In Konkan areas of Maharashtra, young shoots are given in chronic skin diseases. They are used with great success in psoriasis, a skin disease in which red scaly papules and patches appear. The Chinese employ the leaf juice to mitigate the pains in inflammations of the kidney and the bladder and also in virulent gonorrhoea, the dreadful venereal disease. In South Africa the herb is used as a native remedy for local application in the pustules that appear in anthrax infections; a paste of its green unripe berries is also applied there to ringworm, a fungal skin disease. Xosas tribals use the plant for disinfecting their meat.

The ripe fruit is quite edible and much liked by children. It is sometimes administered for patients suffering from pulmonary tuberculosis. It is to be taken mixed with honey.

Both Charaka and Sushruta prescribe this for snake bite and scorpion sting, but modern studies do not confirm this antivenomous property in either case.

However, cases of poisoning have been occasionally reported from eating the berries of the following species of *Solanum* viz. *S. nigrum* *S. dulcamara* (also called *kakamachi* in Sanskrit but

quite distinctly named in English as Bitter-sweet and *S. tuberosum* (potato). The symptoms seen are "A feeling of sickness followed by vomiting, pain in the belly, intense thirst, dilatation of pupils (as it happens when atropine is used, this alkaloid being a characteristic product of *Atropa belladonna*, a member of the same family of Solanaceae), impairment of vision, headache, giddiness, delirium (wild talk), purging and convulsions and a sleep, finally ending in coma or complete loss of sensation."

The plant has one more variety technically called *Solanum nigrum* var. *multiflora* called *biligulla* (the white globose fruit) in Kannada. It is likely that it is this plant whose fruit is white like hen's egg as referred above which is considered to be specially beneficial for patients of piles. This specific information is taken from a famous lexicon of Ayurveda viz. Rajanighantu and also from Bhava prakasha.

3. *Solanum torvum* Swartz.

Names

This plant does not seem to have any name in Sanskrit though it is quite common, widely used and has names in many of our regional languages. It is called *titbaigun* in Bengali; *hathibhekurt* in Assamese; *sonde*, *kadusonde* in Kannada; *chunta*, *kattuchunta* in Malayalam; *kondavuste* in Telugu and *kattuchundai malaichundai*, *sundakka* in Tamil.

Botany

The fruits are eaten as vegetable in fresh and unripe state or as dried and preserved in the form of fries. In both the states, it is a well liked country vegetable and also commonly cultivated in kitchen gardens. The dried berries (*vattal*) are favourite vegetables in Tamil Nadu.

The plant is found throughout India excepting in the Western deserts of Rajasthan, for instance.

This is a hairy, large sized shrub. Leaves are without prickles or with only one prickle beneath and near the base of the midrib. Flowers are arranged in forking clusters or cymes and are always white in colour. Fruit is an edible berry; green and seated on a calyx which has lance like long lobes.

Fruits are said to be good in curing enlargement of spleen or *gulma vridhhi*.

E. TOMATO

Tomato is a gift of the American Continent to the World.

The name is from a Mexican word *tomatle* which was changed into *tomate* by the Spanish (as the Chamber's English Dictionary clarifies), the first European conqueror of that country. It is a New World species that was being cultivated definitely before Columbus arrived there though its exact antiquity is not known precisely. But there is no doubt that it is of an American origin like many

other plants of great common use now such as cacao, maize, potato and tobacco. This is believed to have been confined originally to Peru-Ecuador area from where it spread Northward even before Columbus came to Mexico, where it was domesticated and began to be grown in the gardens. The Spanish conquerors carried the plant to Southern Europe where it was eaten a long time before it got utilised by the people of Northern Europe and even the United States. For quite many a year it was regarded as a poisonous fruit and was grown only as an ornamental herb under names such as Tomato, Love apple or Pomme damour. Infact, it was believed to cause cancer and venereal disease!

To-day however it is extensively grown, cherished and utilised all over the World and stands in great importance next only to the potatoes. They are so intensively cultivated and so many horticultural trials have been attempted on it that there are not less than 200 major varieties of tomatoes now available.

Tomatoes are put to various uses also now. At the outset they are a very favoured kitchen vegetable all over the World and are eaten raw as salads, chutneys or in *raita* - mixed with curd, salted and seasoned or cooked and eaten alone or in combination with many other vegetables. They are also preserved, pickled and canned.

For canning purpose, which is much prevalent in the West, it is only the pulp of the fruit that

retains the characteristic flavour of tomato that is used. The rest of the fruit for instance, the skin, the core, the seeds and the unripe parts were formerly considered as waste and hence, discarded. This is however now utilised as a substratum to express an oil which can be used for eating as food, or in soap making or as a drying oil. The seeds of tomatoes infact contain a valuable semidrying oil and that too in appreciable amounts. This is being commercially exploited in the West, though not in India. The oil cake is also used there as a good cattle feed. Ripe fruits of tomato are also used to prepare many preserved food adjuncts like chilli sauce, tomato sauce, ketchup, tomato pastes and tomato juices. Green tomatoes are also used for pickles and preserves.

Names

Technically, tomato is *Lycopersicum esculentum* (the edible) Mill and belongs to the same family Solanceae of brinjal and potato.

There are no Sanskrit names for the plant; it is wholly a recent introduction in India. Their very names which are mostly related to the basic term tomato in our regional languages indicate this foreign origin. In Hindi, it is *tamatar*, *tumato*, *vilayati* (foreign) *bhanta*; in Arabic, *badanjane hindi*; in Persian, *badangane hindi*; in Marathi, Gujarati, Punjabi, *tomato*; in Kannada, *tomato*, *chapbara badane* (compare *bail wangi* its Marathi name, both meaning a trailing brinjal growing on trellises) and in Tamil *takkali*, *seemai takkali*.

It is believed to have been introduced to India since last hundred years by foreigners. But it is extensively cultivated now in all parts of the country.

Botany

The plant is a coarse, much branching, erect or more frequently a trailing herb, rather hairy and peculiarly smelling throughout. The plant is known so well that it hardly needs a description. Choice cultivation of tomatoes is an exacting agricultural operation. But as they are always in demand, tomato cultivation is a profitable business.

Nutritive and Medicinal Importance

The seeds and the fruit skin contain the characteristic alkaloid solanin of the family. The sourness of the vegetable is due to oxalic acid of potassium. Though the fruit is not much nourishing, it is almost a mine of many important vitamins A, B and C. Probably among all the vegetables, tomato is the best source of the vitamins. The value of the fruit springs mainly because of this rich vitamin content.

Pulp of the fruit and the juice which is of some acid taste as well, are both digestible easily. They are mildly aperient (i.e. laxative), promotive of gastric secretion and excellently purifying to blood. They are also regarded as intestinal antiseptic having a cleansing effect on the intestine specially of the digestive tract. They are reputed to be beneficial in cancer of the mouth and sores of the

mouth. A medicative dose of tomato fluid extract is 1/2 to 1 drachm. It has been seen that even dried tomato remains active and efficient and does so for as long as 14 to 20 months. Medicative dose of the dried tomato is 1 grains to 15 grains.

Tomatoes are rich in all the three major vitamins and are most beneficially eaten in a raw state flavoured with lemon juice, salt, pepper powder and the like or still better, as mixed in salad of chopped cucumber and grated carrot - all, salted and seasoned suitably. A still more profitable way of eating is to mix gratings of coconut flesh and soaked green gram as a *koshimber*. Eating raw or as juice is most conducive to secure the maximum amount of vegetable juices and their vitamin contents. Tomato juice is one of the very popular and refreshing drinks. Raw tomatoes can be made into tasty *chutneys* or *ratta*, a curd dish.

There are many ways of cooking tomatoes. They can be made into curries in which case it is usually mixed with other suitable vegetables for example potato and beans. They may be cut into slices and fried in butter or baked in an earthenware pan with a little butter and placed in a bread toast to form excellent sand wiches or bread pieces. They are scalded to remove their skin and then stewed with butter and then seasoned mildly. Or, they are bruised and cooked with macaroni, rice, eggs or bread crumbs. Fried in butter and mixed with hard boiled egg and then seasoned, they constitute excellent stuffings for sandwiches.

Tanned tomatoes like all tanned fruits do retain their vitamin C and are thus quite valuable. In Europe and the United States of America, tomato juice is used as a substitute for orange juice for children fed on pasturised milk. This acts as a necessary fortification. Its dosage advised for a child of three months is about two teaspoonfuls. Strained tomato juice keeps well in bottles and the latter preserve both the odour and the flavour of the fresh fruit. When this is salted to one per cent, the colour of the juice above the sediment remains a clear golden yellow; this becomes slightly dull if not salted. The fresh tomato juice forms a very good beverage when added with sugar suitably. Fruit juice industries make good use of this fruit. To get over the sediment that often collects here, a repacking can be tried with benefit.

Tomatoes stimulate torpid or sluggish liver and are very good in atonic dyspepsia or indigestion where the muscles of the alimentary canal have lost their normal tone. It has been said with great confidence that "for torpid liver, eat tomatoes, which contain vegetable calomel and then sip water freely between the meals".

Tomato contains citric and malic acids, some salts, water, oxalic acid and oxalate of potash. That is why, tomatoes are contraindicated to persons who suffer from a tendency to gout or rheumatism or uric acid diseases. But it is at the same time invaluable for all those who have a tendency to biliousness or persons of *pitta* constitution as it

promotes a free flow of bile and also in cases of bronchitis (inflammation of the wind pipe) and asthma.

The nutritive and medicinal value of tomato can be summarised thus: tomatoes are the richest among all foods as regards vitamin contents; they are the most marvellous and effective purifier of blood among all the foods known to man; they are the richest of all vegetables in their natural health giving acid content that keep our stomachs and intestines in a perpetual state of health; they are the most extraordinary correctives and regulatives of kidney functioning; they act as gentle natural stimulants that aid in washing away the poison that keeps accumulating in the body and becomes responsible for all ill health, disease and contamination. No wonder then that the physicians of modern times never tire of praising the excellent qualities of tomato, a South American boon to mankind.

Tomato is likely to cause some flatulence specially when raw fruits are cooked and eaten as a vegetable. Ripe tomatoes promote semen formation and are somewhat aphrodisiac, stimulating the urge of sex. Eating well ripe but not over ripe fruits and that too as salads is the most beneficial method of its use.

Tomato soup is very tasty and a good appetiser. This is also advised as wholesome to patients of fever and general sickness. It is also well liked by them.

Giving the juice of tomato is a sure cure to scurvy-a disease of bleeding gums and shaky teeth that arises due to a deficiency of vitamins in the diet one takes. In this respect tomatoes are known to be highly antiscorbutic (viz. antiscurvy). They are also advised to be given to children as a preventive measure to scurvy.

Tomatoes contain sulphur also which is good for any pulmonary disease. They also confer an immunity from bacterial diseases.

It is better to avoid taking unripe tomatoes as they are likely to cause rheumatic pains. The patients of rheumatism and gout should definitely avoid the unripe tomatoes.

Tomatoes are good for backache that is connected with paralysis.

Some Tips for the Best Use of Tomato in the Kitchen

Taking one tomato fruit daily in the morning is an excellent practice. If one adopts this measure for a few months together and regularly, one's health will improve very appreciably. Blood will get purified, obesity will get reduced and urination would become healthy and blemishless. Another simple recipe to an all round development of health is to drink a cup of fresh tomato juice daily in the morning adding to it a pinch of salt and a bit of pepper powder. This is a measure to ward off many diseases. The feeling of tiredness, bodily fatigue and mental laziness will all disappear, thereby.

This is also curative of indigestion, upsettings of stomach, jaundice and diseases of stomach and intestines in general. One could feel very lively and invigorated by such a drink. Patients of diabetes would find tomatoes as a great boon for their health as well as diet. They are best advised to use tomato as much as they can.

Tomatoes are always best consumed in a raw state. Eating them daily will render the teeth and gums clean, healthy and durable. It is not advisable to cook tomato and eat.

Tomato juice mixed with sugar or better still, a pinch of glucose is an excellent and highly refreshing and restorative drink for persons suffering from mental or physical exertions. This also constitutes a very cooling beverage for the hot days of the summer. In fact it almost acts as a very well liked tonic to the developing children, the pregnant ladies, the feeding mothers and the intellectual workers.

Tomato has a cosmetic application also. Apply the pulp of its fruit all over the face, keep this so for an hour and wash the face afterwards in hot water. This measure would gradually remove out boils and pimples on the face and increase the lustre of the face itself. It is necessary however that this should be carried out frequently.

One can cook young tender leaves and sprouts of tomato like any other green leafy vegetable and eat, though such a use is not known to many. This

proves beneficial for persons of rheumatic complaints.

Tomatoes mix well with any food and they can be cooked also with any vegetable but not the starchy ones. For instance cooking tomato along with legumes, cereals and potatoes is not a good combination; these do not cook well together.

Eating tomato ensures a good motion, pure blood and also proves beneficial to patients of scurvy, glandular swellings and eczema. Red, big sized and correctly ripened fruits are the best and these should be eaten raw. The small sized and the round ones are not preferable.

Persons of *vata* or *vata pitta* constitution should avoid tomatoes which are harmful to them and may cause eczema, specially when cooked with gramflour and oil.

When red rashes appear on the skin, gums start bleeding and the teeth become shaky - all, typical characteristics of scurvy mainly, give red tomato juice twice a day. This juice is sure to be beneficial in cases of debility and weakness, also. It removes fatigue, promotes hunger and is beneficial in cases of anaemia.

The juice or a decoction of tomato would be found amillorative in violent fever.

For patients of diabetes mellitus, tomatoes are specially profitable like no other dietary article. It improves their quantity of blood and gradually reduces sugar content in their urine.

Eye troubles like feeble vision and nightblindness that are due to vitamin deficiency respond well to a consumption of tomato.

If the tongue feels unclean and clouded as it were, give 1-2 tomato fruits daily along with *saindhav* salt.

F. LADY'S FINGER OR BHENDI

Lady's finger or *bhendi* is known as *Hibiscus esculentes* (the edible hibiscus) L. botanically. It comes under the family Malvaceae to which many familiar plants like the garden flowers of *Hibiscus*, cotton and the famous Ayurvedic herbs such as *bala* (*Sida cordifolia*), *mahabala* (*S. rhombifolia*) and *atibala* (*Abutilon indicum*) also belong. This is known as Okra in English, a term which English has taken directly from its West African name or *gumbo* which refers to the okra or its mucilaginous pods and to a soup of which okra is an ingredient or a dish of okra pods that are seasoned. The term *gumbo* is a slang word from Louisiana; it corresponds to the Angolan negro term (kin) ngombo. All of this points to Africa, the plant being a native of tropical Africa. It was cultivated in Europe as early as A.D. 1216. It has been however now introduced to most warm tropical and subtropical parts of the World.

The plant is a stout annual herb somewhat resembling cotton plant in appearance. The young, tender and straight pointed pods aptly called Lady's fingers are very mucilaginous and constitute

a well cherished vegetable. This is much used in soup preparation in Europe under the name gumbo which is a Spanish word for okra. This is cooked in various ways but can be eaten raw or dried and fried. It is also dried and canned. The stems and the mature fruits yield a soft fibre of some commercial importance utilised in the West for paper manufacture or even in textiles.

Names

Sanskrit calls this as *bhenda*, *karaparnaphala* a term that is evidently coined fresh. The term *bhenda* is likely to have been taken from an earlier Prakrit language. Most regional languages are unusually similar in calling this highly popular vegetable by the same name more or less. It is *bhendi* in Hindi (which also calls it *ramtura*) Gujarati, Marathi and Punjabi; *bende*, *bendekayi* in Kannada and Telugu; *vendekayi* in Tamil. In Bengali, it is known as *ramtorai*, *dheras* or *dhenras*.

Nutritive and Medicinal Importance

Constituents of *bhendi* are as follows: gum, starch and a great amount of mucilage, considerable percentage of calcium and iron, plus pectin (a cementing material) and gum. Green tender *bhendis* have Vitamin A 740 International Units (INU), riboflavin 0.07 miligram, ascorbic acid 30 miligram, and neocin 1.1 miligram in 100 gram. Tender fruits have more ascorbic acid than what is available in well grown fruits.

The nutritive value of the *bhendi* vegetable can be gauged by noting the following contents. A vitamins 740 IU, thiamin 0.6 miligram, riboflavin 0.06 miligram, ascorbic acid 20 miligram and neocin 0.8 miligram per every 100 gram. Fresh fruits have abundant mucilage, starch and plenty of phlegm expelling material. Even dried fruit has 2 per cent of fleshy matter and in its ash there is calcium, *yavakshar* and magnesia. Dried seeds have 2.1/2 per cent of alkaline matter and in their ash, there is 24 per cent of phosphoric acid.

The plant of *bhendi* has much of iodine also. The greener parts of the plant have appreciable amounts of iodine. Its content is greater in the stems and the leaves than in the roots which also does have some amount of it. As a vegetable, *bhendi* is rich in minerals.

The seeds of *bhendi* can be roasted and are then utilised as coffee seeds to prepare a nutritious beverage. The tender seeds can be prepared into chutney and they are also placed and cooked in *kadis*. In Egypt the seeds are ground into flour and used in the place of maize flour.

The seeds also yield a fixed edible oil which can be used like any other cooking oil.

Ayurveda lists the properties and the action of *bhendi* in the following terms. It promotes taste and is mucilaginous, heavy and is promotive of *vata* and *kapha*. It augments semen production and it is also aphrodisiac (stimulating the urge of

sex) and in addition strengthening it is quite nourishing also.

It is necessary to note that *bhendi* as a vegetable does not suit patients of cough, feeble digestion, diseases of *vata* and *ozena* or *peenas* or foetid exudation from the nose. These persons should avoid *bhendi* as it would prove deleterious to them. Still however, *bhendi* has proved beneficial in chronic cough.

Its taste is sweet, virility is cold and post assimilation effect is again sweet.

Modern opinion considers it as unctuous (or oily), cold, diuretic (promoting urination) and aphrodisiac. It is good for swellings of the throat, *prameha* or urinary affliction that is due to *kapha*, difficult urination and also gonorrhoea. This is particularly effective in stopping the sensation of burning that is sometimes felt during the passing out of urine; *bhendi* is boiled and given then.

Dried fruits or fruit slices of the plant are used beneficially in pains at the stomach or the pains that accompany swellings of the fatty partitions.

Tender and fresh fruits are excellently unctuous (i.e. oily), tranquillising and diuretic.

There is a great reputation that *bhendi* as a vegetable is very good for brain.

A decoction is prepared from its raw seeds and is administered in cold and fever, swellings and urinary burnings.

A special *sherbat* is prepared from the seed of *bhendi* and this is given in cases of urinary and seminal burnings.

Roots of *bhendi* are dried and powdered. This is mixed with sugar candy and eaten by patients of *prameha* with benefit. This complaint can also be cured by taking a gulp of powdered raw seeds and sugar candy.

Roots of *bhendi* are cooked into a confection and given to improve virility.

The bland viscid mucilage of the fruit as well as the plant is emollient (softening) for. e.g. of hard abscesses (and thus aiding in healing) and also demulcent (cooling).

A decoction of the fresh unripe fruits is administered beneficially in gonorrhoeal cystitis and urethritis (inflammation of the urethra) and all other conditions where a difficulty and a distress to pass urine, prevail.

In dysentery the mucilage is beneficial much like that of the famous *isabgol*. (*Plantago ovata*).

The vapour from the hot decoction is used as an inhalation in irritable conditions of throat and in troubles of coughs during consumption or pthisis. Some attempts are being done to prepare beneficial lozenges from *bhendi* for the sake of curing cough much like other similar lozenges in the market.

Yunani physicians consider *bhendi* as second degree cold and dry.

The vegetable is highly mucilaginous and specially nourishing to virility and is effective in checking dysentery. Though this is much eaten as a vegetable, yunani physicians do not consider it as highly nourishing; it is infact regarded as rather heavy for digestion and promotive of constipative tendency.

This is however very beneficial to persons of hot constitution. This is particularly beneficial in them for their complaints of gripings or twisting pain in the stomach, intestinal lesions, wounds, injuries and ulcers, swellings and cough due to heat. In case of gripings and swellings its mucilage is mixed with water and given internally much like *isabgula* and with an equal benefit.

Select very tender and crisp fruits in which seeds have not yet become developed well. Prepare their powder and administer this to patients of spermatorrhoea in which semen is passing out along with urine and in cases of too much thinness of semen. The result is always satisfactory. The mucilage extracted from the bark of the root of this plant is also efficacious in this complaint.

The drawbacks in using *bhendi* much as a vegetable are two: they are digested rather slowly and they are likely to lead to constipation. The means of overcoming is to use this vegetable along with *garam masala* and fresh ginger.

Some Tips for the Use of Bhendi in Household Remedies

Cut a few tender fruits of lady's finger into large sized pieces, cook them well in a small quantity of water and when they have become soft, remove from the fire, mash well, add salt to taste and take. This measure adopted for a week will ward off burning sensations in the stomach, sore throat, and, burnings at the anus as well as during urination.

Taking daily two very tender fruits of *bhendi* raw along with sugarcandy is a powerful aphrodisiac measure.

Consuming preparations of *bhendi* will prove beneficial in cases of burning sensations all over the body, constipation, jaundice and also diabetes.

But an excessive use of *bhendi* aggravates *kapha dosha*, brings about an indigestion and also an obstruction in stools.

Some Relatives of Bhendi

There are two plants of the family of Malvaceae to which *bhendi* belongs that are known as two "varieties" of *bhendi*; these are *vana bhendi* (the wild type) or *Urena lobata* Linn and *chakra bhendi* (the wheel type - probably referring to its wheel like fruit) or *Abutilon indicum* G.Dn. They do resemble the plant of *bhendi* in some ways but both are not edible. They do not constitute any vegetable, though they do have some medicinal value specially *Abutilon indicum* which is the famous

atibala of great many uses in Ayurveda. The leaves of *atibala* however are recommended by *siddha* physicians as a diet to be used by patients of piles.

But there are quite a few species of *Hibiscus* itself the genus to which *bhendi* belongs that are edible and often used as vegetables. These also have some medicinal value or the other. We shall discuss some aspects of these "relatives" of *bhendi* below:

1. ***Hibiscus rosasinensis*** Linn; The common Garden Hibiscus or Shoe-flower.

Names

This is the well known *japa kusuma* of Sanskrit literature, also called *rudra pushpa*.

This is known as *gudhar*, *gudhal*, *java* in Hindi; *jasus*, *jasud* in Gujarati; *gudhal* in Punjabi; *jasvand* in Marathi; *jaba* in Bengali, *dasavala* in Kannada; *shem-barati* in Tamil.

Nutritive and Some Medicinal Use

The best and the most well known and an effective use of this very common garden flower is to prepare a *sherbat* out of its pretty flowers. This is prepared in the following way. Only one procedure is described here; there are many other prescriptions, specially in the Yunani system.

Take 100 good flowers, place them in a glass or a porcelain vessel, add fresh juice of 20 lemons, close the lid and keep over night as such. Next day

morning, strain the following juices in a soft piece of cloth and add into the vessel; after mixing its contents well with your hand: 20 *tolas* of sweet pomegranate and 20 *tolas* of sweet oranges. Also add 80 *tolas* of sugar candy, and 20 *tolas* of distillation (*arka*) of *gavajaban* (*Lycopsis arvensis* or *Borago officinalis*). Cook all of them together on a low fire till the syrup gets the consistency of a *sherbat*. Afterwards, remove from the fire and add 2 *rattis* of *kasturi* or musk, 3 *mashas* of *samber* (*Narscissus tazetta* Linn), 1 *masha* of *kesar* or saffron and 1 *masha* of rose water, after pounding them all together.

Dosage is 2 *tolas* given with any suitable distillation or *arka*.

This *sherbat* gives strength to the heart and the brain. It is also beneficial in insanity and bilious fever.

Flowers of this plant are fried in ghee and given in menorrhagia or excessive menstrual flow. Dark red petals are given as a mucilaginous infusion, as this plant is also rich in mucilage like *bhendi*. This is given for irritable conditions of urinary tract. Combined with milk, sugar and cumin, the petals or the fresh root juice of the white flowered variety is given in gonorrhoea.

An oil is made by mixing the juice of the fresh petals and olive oil in equal proportion and boiling till the water evaporates and the oil alone remains. This is a popular remedy applied over the heart to

stimulate hair growth and to darken the colour of the hair. In fact in China, a black dye is prepared from the petals for the hair and the eyebrows.

Yunani physicians specially employ many preparations of this plant. Cold infusions (*fanta*), distillations (*arka*) and *gulkand* or sugar preserves of the flowers are all highly recommended. These strengthen the heart and confer a sense of well being (*saumanasya*). As such they are beneficially utilised amply in cases of palpitation of the heart, weakness of the heart and insanity. The flower also forms an ingredient of sweet-meats (*majun*) meant for gratifying the heart and pleasing the mind.

2. *Hibiscus sabdariffa* Linn. Red Sorrel. Rozelle hemp.

Names

This is known as *mesta* in Bengali; *patwa* in Hindi; *lal ambadi* in Gujarati and Marathi; *semagoggu*, *erra gonkaya* in Telugu; *kempu pundrike* in Kannada; *shivappu kashuruk vral* in Tamil; *puli-cheera* in Malayalam.

The plant is largely cultivated in the hotter parts of India for its pleasantly sour calyx.

Nutritive and Medicinal Uses

The fleshy red calyx of the fruit contains tartaric acid, an uncrystallisable sugar, mucilage like *bhendi*, tannin, colouring matter and salts. This is used as a fruit of delicacy and when dried it is

used as an article of diet. A cool and refreshing drink is prepared from it. This is very good for curing scurvy.

An acid jelly is also made from these soury and mucilaginous sepals.

This calyx also serves as a good article for pickles, jellies and preserves. It is sour no doubt but also has a delicate and pleasing flavour.

From the fruit as well as the succulent calyx, a drink is prepared by boiling them in water and adding a little salt, pepper, asafoetida and molasses. This is useful in biliousness. In France, an astringent syrup is made with them. For convalescent patients and in cases of mild fevers it forms an acidic and refreshing drink.

Leaves are also sour and emollient (softening). They are often cooked like vegetables and used in curries.

Fruits also constitute a vegetable and are used in preparing curries.

A decoction of the seeds is useful in urinary afflictions, mild indigestion and weakness. The dosage advised is 1-2 drachms, 3-4 times a day.

3. **Hibiscus cannabinus** Linn. Brown Indian Hemp, Jute.

Names

Sanskrit calls this as *shana*, *machika*, *nali*.

In Hindi, this is *ambari*; *patsan* in Bengali; *mestapat* in Gujarati, *ambari* in Marathi, *ambadi* in Tamil *oulimanji*, *pulichi*, *pulicha kira* (sour greens); in Telugu, *gongukuru*, *gogu*; in Kannada as *pundrike gida*, *pundi*; and in Gujarati again as *bhindi*, *ambol*.

The plant looks much like wild *bhendi*. It is cultivated specially in Bengal and Tamil Nadu.

Dietary and Other Importance

The plant yields jute like fibres but should not be confused with true jute which is *Corchorus capsularis*, a plant that belongs to a separate family altogether viz. Tiliaceae. This Deccan jute is similar to jute but is rarely very much superior.

The plant is cultivated in most tropical regions and is also found in a wild state in the Western Ghats.

The young sour leaves and flowers are used as a pot herb vegetable for preparing curries.

The leaves form the famous *gonkura chutney* of Andhra Pradesh.

One *tola* of the juice of the flowers with sugar and black pepper is a popular remedy for billiousness and constipation.

4. *Hibiscus abelmoschus* Linn Musk Mallow.

Names

Sanskrit calls this *gandhapura*, *latakasturika*, *jatakasturika*.

This is called *mushk dana*, *kasturi dana* in Bengali and Hindi; *kasturi vindai* in Tamil; *kasturi bende*, *kadu kasturi* in Kannada.

Use as Food and Medicine

Seeds are highly and characteristically scented very much like musk or *kasturi*.

They are munched to give a fragrant smell to mouth specially after the meals and quite usually along with betel leaf or *pan*. These scented seeds are used to some extent in perfuming medicated oils. In Arabia they are mixed with coffee to prepare a fragrant beverage for the guests.

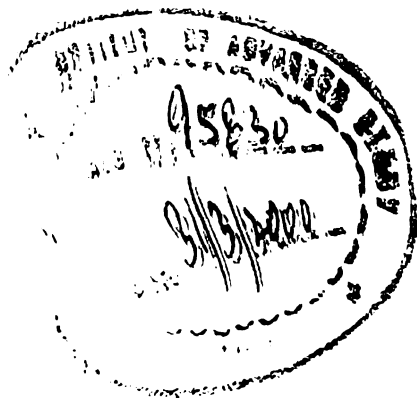
They form ingredients in many preparations used for gonorrhoea, venereal diseases and discharges of the bladder and the ear passages. A drink is prepared from them for use in fever, gonorrhoea. Their fumigation is curative of hoarseness and dryness of the throat.

As in *bhendi*, the roots and the leaves are much mucilaginous. The mucilage is recommended for gonorrhoea and venereal diseases and given mixed with sugar.

Apart from these "vegetable" relatives of *bhendi* there also occur a few other *bhendi* very much similar to the typical garden *bhendi*. They are *Hibiscus ficulneus* (the smaller wild *Bhendi*), *L. H. lampas* (The *blendhi* of the jungles or the wild *Bhendi*) cav, and *H. platanifolius* SW (The Hill *Bhendi*). These are very close to *bhendi* or the

lady's finger botanically but they are hardly edible and are not cultivated.

There is one more variety of *bhendl* which is however quite edible and resembles the usual lady's finger very much. This is a vegetable of Gujarat and specially its Cutch region where it is called *mathantiyo bhindo* viz. a better *bhendl*. Botanically this is *Hibiscus angulosus*. The herb flourishes in the rainy season. Its leaves, flowers and fruits are all like the lady's finger vegetable. But the whole herb is very soft and slippery and covered with velvety hairs. The fruits are 1-3 inches long. The poorer class of people in the Cutch use its leaves and fruits as vegetable for eating. The general properties are similar to the common *bhendl*.





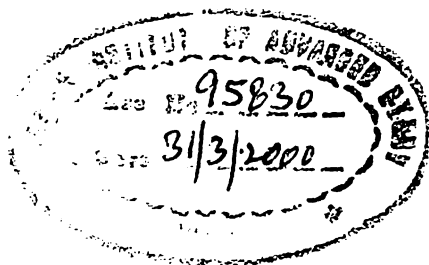
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