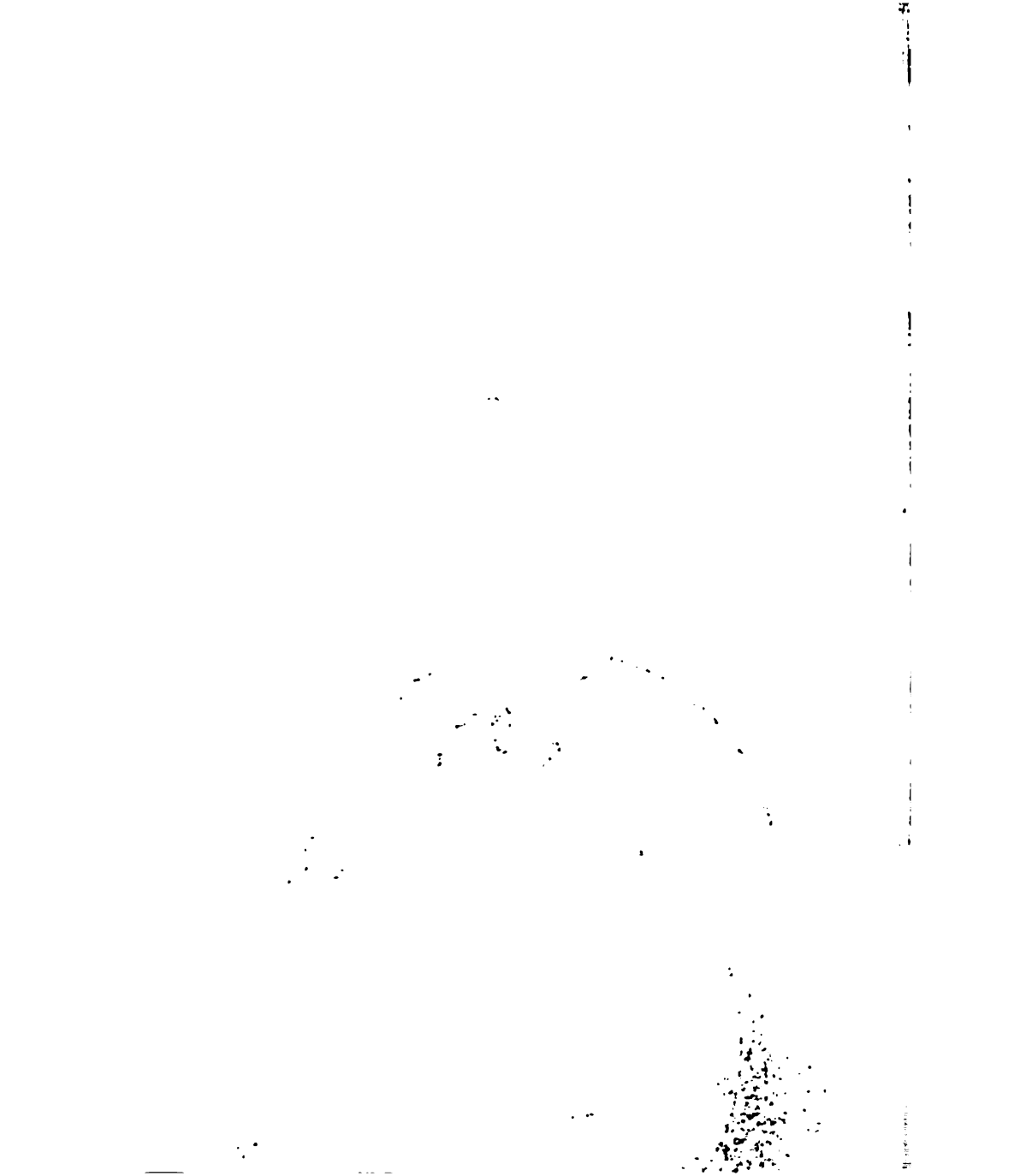
Health Series

Traditional Family Medicine

Gourds and Pumpkins



HEALTH SERIES :
TRADITIONAL FAMILY MEDICINE

Gourds and Pumpkins

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BOOKS FOR ALL
Delhi-110052

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.

Published by
BOOKS FOR ALL,
C-2/9, 3rd floor, Ashok Vihar,
Phase-II, Community Centre,
Delhi-110052.

Typeset by
ABC *for* **DTP**
6, Rajdhani Enclave, Delhi-34.

Printed at
D.K.Fine Art Press,
Delhi-110052

PRINTED IN INDIA

INTRODUCTION

Gourds, pumpkins, melons and cucumbers—all of them are very common and highly popular fruit vegetables and dessert fruits all over India. Besides, every one of them occurs in bewildering varieties differing from one another chiefly in colour, shape, size, surface patterns, consistencies and delicacies of their fruits as well as in the many details of leaf, climbing patterns, hairiness of the stem and so on. Quite commonly these several varieties are restricted to different regions of our vast country and every region would like to claim that its particular variety alone is the best! Among these, cucumbers are botanically known to have been evolved in India itself. Naturally its reference occurs very commonly even in the Vedic Literature,

where it is referred to as *irvaru*. Its cultivated varieties available in the different parts of our country now are also phenomenally large in number.

All of these plants and a few more come under the botanical family Cucurbitaceae. This is a very huge family comprising of 90 genera and 750 species distributed in the warmer parts of the world particularly in the tropical regions. They are all weak stemmed herbs or undershrubs, creepers and climbers and are usually climbing by means of tendrils. They share a number of features in common and are all easily recognisable. Leaves are alternate on either side of the stem and not opposite to one another. They are simple, stalked, frequently heart shaped, characteristically palmate (divided like a hand) or pedate (divided like a foot i.e. palmately lobed with the outer lobes deeply cut). They also have a hand like or palmate pattern of nerves with usually 3-5 main nerves coming out from a common base as in the fingers of a hand, with a close net work of minor veins in between. Tendrils when present are lateral, solitary, simple or divided and spirally twisted. Flowers are unisexual, the male and female flowers occuring in the same plant or in two different plants altogether—a condition called monoecious or dioecious respectively. They are yellow or white in colour and may occur solitary when they are large or in inflorescences when small. Flower clusters may be a raceme (an elongated rather cone like

gathering of stalked flowers) or a panicle (much branched and rather lax).

The ovary of the flower which finally develops into the fruit is *inferior*. This means that the other parts of the flower like sepals and petals grow over it; as such, in the female flower, this ovary appears like a swollen, small greenish structure below the rest of the flower. This small little structure however becomes quite a big fruit, sometimes of an enormous size as in pumpkin (the *kaddus*) after fertilisation. It is this fruit that is the most important part of the plants though the other parts such as the roots and the leaves also do have their own uses—mainly in medicine. The fruit is technically called a *pepo* and characterises all members of the family uniquely and invariably. Such a type of fruit does not at all occur in any other family of plants. It develops from an inferior ovary made up of three units called carpels that together enclose a single cavity within. On fertilisation the wall of the ovary grows to a huge size, enclosing numerous flat seeds lying attached to a fleshy portion, the *placenta* around the margin of this cavity. Simultaneously the placenta also grows to a huge size embedding within it the large number of seeds inside its fleshy mass. The placenta sometimes becomes fibrous as in some of the gourds (eg. Bottle Gourd - *Luffa*) and pumpkins but this is also usually edible. The mature fruit has a hard epicarp or the outer most layer of the fruit wall; this may or may not be edible. The pepo

fruit is an edible fleshy berry and is mostly indehiscent viz does not break open at maturity but merely disintegrates to release the seeds within. In some species however it does break open along the sides by means of valves or door like structures or in a way similar to a box opening out through a lid at the top viz in a *circumscissile* (breaking out all along the circumference) manner. This is what happens in a species of cucumber called a Squirting cucumber that squirts out or expels forcibly the seeds within, at regular intervals through the open lid.

Seeds are always innumerable; they have a hard testa or seed coat by which they resist being digested in the alimentary tract. Their rapid propagation is facilitated by this means. The seeds are rich in an edible oil-a fact that still remains much unexploited either commercially or in terms of their nutritive value.

The value of cucurbitaceous plants is two fold. Of first account, is their fruits - which are generally massive, delicious and refreshing. They can be cooked and eaten, wherein, some of them, for e.g. the snake gourd or *purwul* are highly nourishing and wholesome, while others like the different kinds of Bitter gourd or *karela* or the edible *coccinia* or *tondli*, have unique and delectable tastes. There are others like cucumber and its many choice garden varieties which are best enjoyed raw and form the ideal salad components of the hot tropics. Yet others like the water melon,

musk-melon, tarbuz and so on are *the* ideal summer specials—sweet, cool, pleasantly aromatic and invitingly refreshing. The fruits that this family offers have all the variations we may desire—even as a choice base for preparing *halva* as in *petha* and *lauki*. Still however they do not serve as foods in the strict sense of the term—though the tribals of Bikaner in Rajasthan are said to sustain themselves for months together solely on a diet of water melons. This means that they do not have any calorific value viz. enough starch for instance, which can be ultimately converted into energy, which is the principal objective of nutrition. Their value lies more in the organic mineral salts and the vitamins they supply. For example as regards its richness of mineral content and the vitamins there is almost nothing superior to cucumber; even spinach or *palak*, the most highly valued *palak*, falls much below in its comparison. It is quite understandable therefore that the fruits of this family have been the characteristic vegetables of Indian kitchens from times immemorial. They are very popular almost everywhere in India.

Of second account is the varied medicinal uses of these plants. They have always been very familiar plants to man and almost always within an easy reach. During his long association with these plants, man has naturally found out many uses of them for his own varied ailments of the body as well as the mind. Physicians of many systems of Medicine, Ayurveda, Yunani as well as

Siddha freely prescribe them with confidence born of experience and tradition. Quite often as in Bitter-gourd, Bitter Snake gourd and Colocynth, practitioners of modern Medicine also concur with their claims.

We shall attempt to present a brief account of the varied medicinal uses of the members of this family, as they grow in India.

The important aspect here is that these plants occur in such a great variety in India and in so much profusion and familiarity almost everywhere, that unless we make it a point to have atleast a glimpse of most of them, we would not be doing justice to our actually available great wealth. Most of these plants do have their own individual names in the regional languages of the areas of their distribution. We include here all the important Indian genera and most of the common species available under them. Names of the latter are first given in major regional languages and then follow the nutritive as well as the medicinal uses attributed to them.

The fruits are often laxative (causing mild motion), sometimes very bitter in taste and strongly emetic (causing vomiting) and cathartic (causing purging). The roots are occasionally acrid (pungently biting) in taste and also act as drastic purgatives. The seeds are more or less mucilaginous (slimy) and they always contain an edible oil. Apart from these fruits and seed oil,

many other important products are also obtained from several members of this family. There are specific types of resins and resinoids such as bryoresin, citrullin, elatein, phytosterolin; glucosides (bryonin, colocynthin) and many alkaloids of unknown constitution. These substances have industrial or medicinal values of varied nature.

There are many plants of the family that are officially recognised medicinal plants in several countries of the world apart from India. A few of them are: *Citrullus colocynthus Schrad, Cucumis sativus, Lagenaria vulgaris Ser, Cucurbita pepo* DC, *Elaterium* and *Momordica charantia* L. Of these *Citrullus* is official in most European Countries and Japan. It very often happens that some species of a genus are very famous vegetables while other species of the same genus or even just a variety of the same species are highly bitter, just unedible but quite useful medicinally.

We shall attempt to acquaint ourselves with a few important plants of both kinds. It can be said that many of the members of this family are natives of India and the vegetables of these fruits are typically Indian. The medicinal reputation of some of the plants for eg. *Citrullus colocythus* or *indravaruni* is as old as the Vedas. Its very name is vedic, made up of two vedic gods Indra and Varuna, now usually corrupted to *indrayan*. Historians of Modern Medicine acknowledge that this colocynth like the other famous purgative

drug, turpeth (a corrupt form of the Sanskritic term *trivrit* for *Ipomea turpethum*) is a distinctive contribution from Ayurveda that had reached the drug trade of very early European Medicine.

To render the presentation more familiar and homely, the plants are all discussed under their simple Sanskritic names most of which are familiar all over India, giving by its side itself the Hindi and the English names. Botanical nomenclature comes only after these three.

The total list of the plants discussed are: (1). *patola* (*parwul*, Snake gourd or *Trchosanthes*, 6 species), (2) *alabu* (*lauki*, Bottle Gourd or *Lagenaria*, 3 Varieties), (3) *dhamargava* (*Ghia* or Sponge Gourd or *Luffa* 4 species), (4) *karavella* (karella, Bitter Gourd or *Momordica* 6 species), (5) irvaru (*kakadi* cucumber or *Cucumis* 4 species), (6) *chitraphala* (*indrayan* and *karbuz*, the colocynth and water melon or *citrullus*) 3 species), (7) bimbi (*bimb* or *kunduri* - *Coccinia*) and (8) *kushmanda* (*kaddu* gourds and pumpkins *Cucurbita* 2 species). Almost all the Ayurvedic authors classify all of these plants under the group of culinary vegetables (*shaka varga*).

Besides the above, we include a few other common plants of this family which do not produce any fruit vegetables and are thus only of medicinal importance. Chow-chow or *Sechium edule* a very recent introduction to India from America is also included as it is now a very common fruit vegetable in many parts of India.

INDIVIDUAL PLANTS

1. Patola (*purwul* in Hindi and Snake Gourd in English)

Botanically this comes under the genus *Trichosanthes* and is called *Trichosanthes anguina* Linn, a very well known vegetable and an Indo Malayan plant. As remarked above this resembles another plant specially in its fruits viz. T. *cucumerina* Linn. much, where however the fruits are very bitter and wholly unedible. The latter happens to be a much reputed medicinal plant. Other important members of the genus *Trichosanthes* are *T. Palmata*, Roxb, *T. dioica* Roxb, and T. *nervifolia* Linn. Quite often, regional languages recognise all of these different species of the genus as but "varieties" of *patola* and name them rather similarly as well, by giving some appropriate qualificatory terms such as wild *patola*, bitter *patola*, the hill *patola* and so on.

(i) **Trichosanthes anguina** Linn. The Snake Gourd

Names

There are many names for this ancient kitchen vegetable in Sanskrit: *ahiphala* (with a snake like fruit); *dirghaphala*, *sudirgha* (with long fruits); *griha kulaka* (a house hold vegetable?); *shvetaraji* (with white streaks on the fruit); *chichinda*, *cichunda* (these two terms are probably taken as such from some *prakrit* language).

It is called *chichinga* in Bengali; *padavli, mitha patol* in Gujarati; *chachenda, chachinga* or *purwul* in Hindi; *padavala* in Kannada, and Marathi; *chichinda, pandol* in Punjabi; *padawalangai* in Tamil; *potla* in Telugu; *chachenda* in Urdu and *chhachhindara* in Uriya.

Botanical Description

This is a very favourite vegetable crop all over India. It resembles *T. cucumerina*, the bitter 'variety' exactly excepting in its fruit, which differs mainly in being very variable in both the shape and size. The fruit varies from 0.3-0.9 metres in length and is often much contorted. It is striped white and green longitudinally when young but changes into bright orange colour on ripening.

The plant is extensively cultivated in the hotter parts of India and China. It is also quite common in Sri Lanka, Malaysia and the Far East.

Medicinal Properties

The fruit is considered a tonic and is reputed to cure the aggravation of *vata*, thirst and biliousness or the disorders of liver.

Yunani physicians consider the roots and seeds as anthelmintic (countering helminthic worms) and curative of diarrhoea. It is used in liver troubles and also in the veneral disease of syphilis. The fruit qunches thirst undoubtedly, increases appetite commendably and also acts as tonic and a stomachic (good for stomach).

The seeds are considered cooling and refreshing.

In Vietnam the plant is used actively as a purgative and a remover of worms in general. The fruit is also regarded by the local physicians there as a purgative, an emetic (vomit inducing) and countering to helminthic worms. In the Philippines the net work like soft material around the seeds is given as a corrective infusion in water in cases of debility or weakness. The parts used are: fruit, leaf and root.

As An Article of Diet

Ayurveda recognises the following properties for the sweet *patola* fruit as food: It is light for digestion, sweet in taste, unctuous or oily in nature, stimulative of digestion, nourishing and aphrodisiac or promotive of the urge of sex. Its use can remove out the *kapha* and destroy the disorders of blood. It is a cardio tonic (i.e. a tonic to heart) and is employed to counteract the aggravations of all the three *doshas* and also cough, fever and germs. Fruits are cooked and eaten when green; when ripe, they are purgative. Because of its easy digestibility and simultaneously commendable nourishing nature, the fruit forms an ideal food for persons of weak digestion and more importantly for canvalescing patients who are in need of quick, immediate and wholesome nourishment. An ideal preparation towards this purpose is to cook the fruit along with green gram (another very easily digestive and highly nutritive article) with just mild seasonings. If the

aggravation of the *doshas* is not very severe, cut or shred the fruit into small pieces, roast them slightly without adding any ghee or oil, add salt as needed and a little of black pepper, cumin seeds, coriander and ginger, sprinkle a small quantity of water and cook now on low fire. When cooked well, remove, cool and this forms a very wholesome diet (*pathya*). Appreciatively, young fruit is often used as a substitute for French beans. Roasted bits of fruit can also be used nourishingly in the form *of a patchadi* with curds.

Ripe fruit is sour and sweet and a good vegetable for an excellent *raita*.

Another recipe for a very satisfying, light, strengthening as well as *dosha* removing and wholesome diet is as follows. Cut the fruit into any required sized pices and cook them in 16 times the quantity of water. Add with it *pippali, pippali mul, chavya*, ginger, black pepper, cumin and coriander seeds in small quantities and salt as per taste. When the quantity of water gets reduced to one forth of its original, remove from fire, cool, filter and give this to the patient in small quantities and at frequent intervals. This is a tasty and a readily recouping diet for all convalescents.

A curry prepared with snake gourd by itself or with meat is very nourishing and tissue building.

This vegetable is particularly beneficial to persons with hot constitution as well as diseases that are due to heat. Fresh juice extracted from

tender fruits is cooling and mildly laxative. However this itself or along with other nutritive substances can be used as a nourishing diet.

Leaves according to Ayurveda are also stimulative of digestion. They are themselves digestive, light, promotive of virility, hot and destructive of fever, cough and worms. Their decoction is advised in fever.

Yunani physicians advice in chronic fever to soak overnight a *tola** of the tender stems and leaves, crushed with dry coriander seeds in 20 *tolas* of water. This is to be filtered next morning, mixed with honey as required and given, half a quantity in the morning and the remaining by evening.

Leaves of sweet snake gourd are useful in getting relief in case any portion of the body is scalded by fire. Applying a soft piece of cloth soaked in a decoction of these leaves over the scalded regions will greatly relieve the burning sensation.

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* The modern equivalents of the traditional units of weight measurements in the Text henceforth are as follows:
1 *ratti* = 1 gunza (seed of Abrus precatorius),
8 *gunzas* = 1 *masha*,
10 *mashas* = 1 *tola*
24 *tolas* = 1 *ser*; 1 *tola* = 10 grams.
1 drachm (dram) 1/12 of an ounce; 1 ounce = 1/12 of a pound troy = 480 grains.

Roots of the sweet snake gourd is a mild laxative. In what is popularly called *purwal* there are two varieties: sweet and bitter. Even in the sweet there are two 'varieties': T. *anguina* and *T. nervifolia*; the latter has a more restricted distribution found in Bengal and Konkan, Coorg, Tamil Nadu (Pulny Hills) and Sri Lanka. The bitter kind also shows two 'varieties': both are botanically *T. cucumerina*. The sweet variety forms a prized vegetable while the bitter one forms a valuable medicinal plant. As a vegetable the former is regarded to possess a host of desirable properties such as virilifying, nourishing, stimulative and so on; that is why it is called *kulaka*—a family dietary article.

(ii) **Trichosanthes cucumerina** Linn. The Bitter Snake Gourd.

Names

Inspite of the proverbial bitterness of the fruit, it is called in Sanskrit as *amrita phala* (a nectarine fruit). Quite likely this name reflects its medicinal reputation. Its other names in Sanskrit are: *bijagarbha* (fruits, full of seeds), *lata phala* (a fruit of the twining plant), *naga phala* (snake like fruit), *pancharaji phala* (a fruit with five streaks on its surface), *panduka, pandu phala* (fruit which is whitish in colour), *raji phala* (fruit with streaks), and *karkasha cchada, karkasha dala* (with rough surfaced leaves). These are all descriptive terms. The following names indicate its medicinal capabilities: *jvaranashana* (destructive of fever),

kasa bhanjana (disruptive of cough), *katuka, katuphala, tikta bhadra, tikta phala, tiktottama* (bitter, auspiciously bitter), *tikta patola* (bitter *patola*); *kushtaha, kushtari* (destructive of *kushta*).

It is known as *ban chichanga, ban patol* (the wild *patola*), in Bangali; *kadvi padavala, kadvipatola, patola* in Gujarati, *jangli chachinda* in Hindi; *bettada padavala* (the hill *patola*), *kahi padavala* (the bitter *patola*), *kiri padavala* (the smaller *padavala*) in Kannada; *jangli padavala, ran padavala* in Marathi; *gwal, katri, mohakri* in Punjabi; *peyppudal, katheppeya pudal* (the wild and the ghost *patola*) in Tamil; *chetipotla, adavipatpotla* (wild *patola*) in Telugu; *patol* in Urdu.

Botanical Description

This is an annual climbing wild plant which is monoecious viz. it is either male or female and never both. Stem is long, slender, weak and furrowed. It is slightly hairy. Tendrils are usually divided into 2-3 branches. Leaves are 5-12.5 cm long, usually a little broader than long. In shape it is rather round, slightly kidney shaped, more or less deeply lobed (into 5, or rarely 3-7 parts). The lobes are broad, acute tipped and their margins have teeth like edges placed rather distantly. Leaves are hairy and very roughly so, specially on the under side and in the older leaves. Base of the leaf is deeply heart shaped; stalk is long and shows striae or longitudinal furrows or lines. Male flowers

occur in axillary elongated clusters. Petals are white and characteristically laciniate at the edge or it looks as if it is slashed of or cut into many narrow lobes giving a very pretty appearance. Female flowers do not form any inflorescence; they are solitary. Fruit is 2.5 - 7.5 cm long, ovoid-fusiform (fish shaped), tapering at both the ends and provided with a long sharp beak, green and striped with white, when young and scarlet red streaks when ripe. Fruit wall or the pericarp is thin. Seeds are somewhat elliptical, laterally compressed and minutely wrinkled. They are surrounded with a red pulp.

The plant is a wild climber found throughout India, Sri Lanka, Malaysia and North Australia.

Medicinal Properties

The plant is used in brochitis (inflammation of the wind pipe). The root is cathartic (a drastic purgative) and is a reputed drug in curing headache and boils. The leaves are good in biliousness or *pitta dosha*. The fruit is bitter and pungent in taste, hot in action. It is laxative, good for stomach and acts against fever, bringing down the temperature. It allays thirst and also asthmatic violence and is found effective in curing many other diseases viz. itching, leucoderma, burning sensation, pleurosy, ulcers, erysipelas and eye diseases.

The oil from the seed is a sure cure for bronchitis. Very importantly the whole plant is a

cardiac (heart) tonic and is also a commendable general tonic. It reduces the temperature during fever and is useful in boils and intestinal worms.

In Maharashtra the plant is very well reputed for bringing down fever. For this purpose, its decoction is given along with ginger—another bitter drug *chirayata* and honey to mitigate the bitter tastes of the two. In Konkan region the leaf juice is rubbed over the liver region or even the whole body in cases of repeated, intermittent fevers. In Malabar, seeds have a reputation of being good in the disorders for stomach. A decoction of the tender sprouts and dried fruits is a known bitter but is given along with sugar to assist in digestion. The seeds act against helminthec worms. The juice of the leaf freshly taken is emetic (vomit inducing) and that of the root which is drunk in a dosage of 2 ounces is very purgative.

In Sri Lanka, the root decoction is actually used to expel intestinal worms. The leaves and stems are used as a decoction in billious disorders, skin diseases and also as an emmenagogue i.e. to regulate menstrual disorders. The fruit is a recognised bitter and a drastic purgative in Vietnam.

Ayurveda attributes a very large number of properties to this bitter Snake gourd. Infact, this plant represents one of its famous drug material. It is considered light in digestion, dry in quality, pungent and bitter in post assimilatory effect. It is hot in potency, palliative of all the three *doshas*,

good for stomach (*rochana*), stimulative of digestion, easily digestive in itself, regulative (*anulomana*), purgative and strengthening as well as countering to toxic or poisonous substances. It is beneficial in piles, worm infection, plethora (i.e. bleeding at nose and rectum), oedema or swellings, itching, skin diseases and leprosy. It is also advised for fevers due to biliousness, and any chronic fever for that matter. It is prescribed with confidence in many cases of general debility and run-down conditions. It corrects feebleness of digestive power, excessive thirst and tastelessness in food. It purifies blood, relieves pain, heals wounds and helps hair growth.

Naturally therefore there are many household remedies employing this bitter snake gourd. A few of them are as follows:

The root is ground down and applied on the head to secure relief from headache. Fresh leaf juice is applied to cure ulcers and wounds and also to promote hair growth in case of baldness and premature hairfall. A decoction of its fruit along with *vacha* and *chirayata* is useful in all kinds of fever. In fever due to biliousness, a decoction of its leaves and coriander is advised. A massaging with the leaf juice is done to reduce the temperature raise in fever. A decoction of the fruit is beneficially given in cases of splenic enlargement, jaundice and andominal disorders.

An interesting use of the fresh juice of the unripe fruit is in refining or culturing (*bhavana*) of

many mercurial preparations employed in curing leprosy and rheumatism.

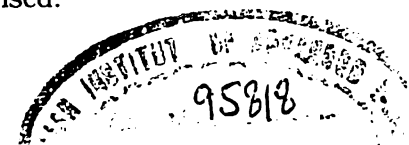
In fevers due to *kapha* aggravation, take six *mashas* of the leaf with its stalks along with an equal quantity of dry ginger, prepare a decoction of both together and administer half the quantity in morning along with honey, and the remaining half by dusk. By such a measure, *kapha* will get expelled easily, the morbid stool would be purged out and the violence of the fever gets mitigated soon.

This plant forms an ingredient with many other drug plants and is employed in several diseases beneficially.

A few examples are:

For any type of acute fever: Administer a decoction of its five parts (root, stem, leaf, fruit and seed). Simultaneously soak 3 *mashas* of them along with 3 *mashas* of coriander over night in water. Filter this water next day morning and give it to the patient. Adopt the same procedure in the morning and give its water at dusk. 3-4 days of this measure will remove any type of even difficult fevers.

For pain and inflammation in the rectum: Washing the region with a decoction prepared from the leaves of *patola* and *mulethi* will prove beneficial. In children where because of unhygienic upkeep of the area, boils and abscesses arise accompanied with much itching, a ghee prepared from the leaves is advised.



(iii) **Trichosanthes palmata** Roxb:

Names

Sanskrit calls it *mahakala*, very black.

The names in many regional languages are more or less the same. Other names relate this plant to another famous purgative member of the family viz. *indrayan* or *Citrullus colocynthes*. It is known as *makal* in Bengali; *ilaru, indarain* in Garhwal; *indrayan, lalindrayan* (the red *indrayan*), *mahakal, makal* in Hindi; *avagudde hannu, kagemari balli* in Kannada; *kavandala makal* in Marathi, *kakatondi* in Malayalam, *ankorattai, shavari palam* in Tamil; *avaguda, donda* in Telugu; *indrayan* in Urdu.

Botanical Description

The plant often climbs to a height of 9 metres. Stems are robust, woody below, much branched and grooved on the surface. The older regions are light grey in colour with scabrous or rough spots all over while the younger regions are smooth and green. Tendrils are divided usually into 2 or more, commonly 3 branches. Leaves are 6.3 - 12.5 long and broad as long, much variable in shape and usually divided palmately (i.e. like the palm of the hand) into 3-5 lobes. They are dark green above (*mahakala*), paler beneath, frequently with dark coloured circular glands scattered along the lower side (*mahakala*), non-hairy and quite often provided with rough small scales above and on the nerves beneath. Its base is heart shaped and the lobes are mostly dentate or teethed. Male flowers

occur in axillary elongated clusters. Petals are long, wedge shaped and fringed with frills as it were as it is typical in the genus. Fruit is 3.8 - 5 cm. in diameter, globose and streaked with 10 orange lines. The fruit wall is thick. Seeds are numerous, ellipsoid, slightly thinned at the base.

The climber is quite a common wild plant throughout India upto 5,000 ft. in the Himalayas. It is also very common in Sri Lanka, Malaysia, China, Japan and North Australia.

Medicinal Properties

The fruit is found useful in asthma, ear-ache and ozoena (the fetid discharge from the nose or *pinas*).

Yunani physicians consider the fruit as bitter, carminative (removes of gas trouble in the bowels) and purgative. It is said to lessen inflammation in general, cure hemicrania or partial headache, weakness of limbs, opthalmia (eye afflictions) and leprosy. It is used with beneficial results in epilepsy and rheumatism. Its gargle is good for tooth-ache but a smoking from it would induces a vomiting of blood. The seeds are also both vomit inducing and in addition, purgative.

Pound the fruit well, mix it with warm cocoanut oil and you will secure an effective ointment for application to sores under the ears and the nostrils. The juice of the fruit or the root bark is boiled with gingely oil to secure a very beneficial oil for bathing; this will relieve long-standing or recurrent headaches.

In Maharashtra however smoking of the fruit is advised to get a relief from asthmatic distress. The root is rubbed into a paste along with an equal quantity of colocynth root and applied, to carbuncles or inflammed painful ulcers. Along with equal portions of the three myrobalans (the *triphala*) and turmeric, this is made into an infusion which is flavoured with honey and given in gonorrhoea. Munda tribals of Chota Nagpur boil the root and fruit with mustard oil and use it in complaints of severe headache, as an external application and as a massage.

The fruit is a violent purgative. The oil obtained by boiling it in gingely or cocoanut oil is applied to the scalp of the head; this will cure partial headache and also ozoena. The oil is also dropped into the ear in case of ear-ache.

The rind and the pulp of the fruit contain an amorphous bitter principle called trichosanthin; this resembles very much the active principle of colocynth viz. colocynthin. This is slouble in water as well as alcohol and causes a violent purging. Fruit is thus a drastic hydragogue (viz which simultaneously removes out the water content of the region) and a purgative. It is therefore considered poisonous and is usually employed to kill the crows. This same fruit however is smoked as noted above in asthma and lung diseases. It is also used as a fumigatory in ozena and many other undesirable discharges as well, from the nose.

Root of the plant is also poisonous but is used as a veterinary medicine to cure pneumonia in the cattle.

(iv) **Trichosanthes cordata** Roxb

Names

It is called *bhumikhumbha* (a pot within the earth), *bhuminkumara* (both referring to its large underground tuber) and *patol* in Bengali.

Botanical Description

This is an extensive climber with large tuberous roots within the earth (which is why it is called *bhumi khumbha*) and stout branching stems above. Tendrils are also very stout and they are divided into three branches. Leaves are 15-20 cm, broadly ovate and heart shaped; the margin is entire or faintly angular. They are dark green above and have short scattered hairs on both the surfaces. Leaf stalks are also stout, 5-10 cm long. Male flowers occur in a few flowered elongated clusters. Fruit resembles that of *T. palmata*.

The plant is essentially of Eastern India in its distribution. It is found in Upper Gangetic plains, along with the base of the Himalayas from Nepal eastwards and in Sikkim, Assam, Bengal and Burma.

Medicinal Properties

The large tuberous root is used as a valuable tonic and also in the enlargement of spleen and

liver and as a substitute for Calumba. The latter is an East African medicinal plant called *Joteorhiza columba*, much reputed as a tonic and stomachic (a drug which is good for stomach).

In Dacca of Bangladesh, the root is dried and powdered and this powder is given in doses of 10 grains in enlargements of the spleen, the liver and the abdominal viscera. The fresh root mixed with oil is a common application for the ulcers of leprosy. The dried flowers are given as a stimulant in doses of 2 to 5 grains.

(v) **Trichosanthes dioica** Roxb. The wild snake gourd.

Names

Sanskrit calls it by many names : *meki, parvagi, parvara, patola, piluparnika* (leaves are like those of *pilu* or *Salvadora oleoides* De), *putulika; rajanama, rajapatola* (the kingly), *supathya* (very wholesome) and *vrittabija* (seeds rounded).

It is called *patol* in Bengali; *potala* in Gujarati; *palval, parvar* in Hindi; *kahi padavala* (*patol* which is bitter) in Kannada; *patolam* in Malayalam; *palwal* in Punjabi; *kombuppudalai* (a horned *padavala*) in Tamil; *parawal* in Urdu and *patal* in Uriya.

Botanical Description

This is an extensively climbing plant with slender stems which are more or less rough

throughout and wooly. Tendrils are divided into 2 to 4 branches. Leaves are 1.5 - 5 cm, ovate—oblong with a heart shaped base. They are not lobed unlike as in many other *Trichosanthes* species (hence named *piluparni*?). They are rigid and rough on both sides. Male and female flowers occur in separate plants. Male flowers are wooly on the outside.

Fruit is 5 - 9 cm long, oblong or nearly spherical, smooth and orange red when ripe.

Seeds are ellipsoid and compressed.

The plant occurs throughout Northern India extending upto Assam and Bangladesh.

There are two varieties of this plant, one with oblong fruits like the *tondli* (*Coccinia indica*) and the other with globular fruits.

Medicinal Properties

This plant is a good remedy for bronchitis. The root is a drastic purgative. The leaves counteract helminthic worms, and also *pitta dosha* and act as a choice cure for bronchitis. The fruit is sweet, oily, good for stomach, cardiotonic, fattening, digestible easily and an excellent appetiser. It cures the aggravations of all the three *doshas* and also cough and the diseases of the blood. As an article of diet, it is worth being more popularised.

Yunani physicians also consider the fruit as a tonic and an alterative drug or the one that brings about desirable changes in vital functions of the

body. It is useful in heart troubles, obstinate fevers and boils.

The root is a drastic purgative. The flower is a tonic and an aphrodisiac, stimulating the urge of sex. The ripe fruit is sour, sweet and also a tonic and an aphrodisiac. It is reputed in general to remove impurities of the blood.

The fruit finds an application in Gujarat against spermatorrhoea (wherein sperms are ejected along with urine). The fresh juice of the unripe fruit is often used as a cooling and laxative adjunct to a few alterative drug preparations. A decoction of the leaves of this plant and of coriander in equal parts is given in fevers and also as a laxative.

The unripe fruit is eaten and generally used as a favourite culinary vegetable. It has many desirable medicinal properties and is also wholesome, nourishing and easy to digest. As such it is specially suited as a diet for convalescent patients for a quick recouping. Its leaves are also tonic and a febrifuge (i.e. a remover of fever). Infact they constitute a good diet in sub-acute cases of liver and spleen disorders, piles and fistula in *ano*. Young and unripe fruits are valued by Europeans next to potatoes and brinjals. Even tender terminal twigs of the plant form a good pot herb for kitchen; they are regarded as tonic and vermifuge (i.e. expeller of worms). A decoction of the leaf stalks is a well reputed expectorant drug, helping in expelling the phlegm by inducing cough.

In Malabar seeds are considered excellent medicine for stomach diseases.

Two compound preparations or *yogas* of *patola* are the following:

(a) *Patoladi quatha*; a decoction of *patola* and others. Take one drachm each of *patola* leaves; *Picrorhiza kurroa* (*katu rohini*), red sandal wood, root of *Sanseviera zeylanica* (*murva*) and *Tinospora cordifolia* (*guduchi* or *gulancha*) and one *ser* of water. Boil till the latter gets reduced to one fourth.

This is a recommendation of Chakra datta for fevers.

(b) *Patoladi churnam;* a powder of *patola* and others. This is a very popular medicine. To prepare this, take two *tolas* each of the roots of *patola* and turmeric, seeds of *vaya vidanga* (*Embelia ribes*), the three myrobalases (*triphala*); three *tolas* each of cinnamon bark, root of indigo plant, and four *tolas* of turpeth—*Ipomeo turpethum*. Powder them all very fine and make a homogenous mix. This is used as a drastic purgative in jaundice, anasarca (a diffuse dropsy or morbid collection of water in the skin and subcutaneous tissues) and ascites (morbid water collection in the abdomen). The recommended dose is: one drachm with cow's urine. After its medication, only light food such as rice gruel is to be taken.

Many classical authors on Ayurveda have extolled the diverse uses of this wild snake gourd. Some examples are as follows:

Charaka: A powder of the leaf of *patola* or its decoction or freshly extracted juice is beneficially administered along with honey in *rakta pitta* or bleedings at nose and rectum.

A decoction of *patola* is advised in removing the ill effects of excess liquor or alcoholism. A curry made out of this *patola* is wholesome in oedema and cases of poisoning.

Chakra datta: A decoction of the inner bark of neem and the five organs of this *patola* is excellent in curing fevers due to biliousness as well as *kapha* or phlegm.

A highly commanded diet for a patient of fever is the curry of the leaves of this *patola*.

In fever due to biliousness, giving a decoction of the five organs of *patola* and barely (*yava*) along with honey is advantageous.

In the diseases due to *vata*, a soup prepared from this *patola* is strengthening and also beneficial as it also counter acts *vata*.

Shodala: To cure headache, crush the leaves of this *patola* in water and apply on the forehead. Any severe headache responds favourably to this simple treatment.

Sharnga dhara: Extract the fresh juice of the wild *patola* and apply on the head to promote the growth of hair in premature baldness. Hairs are expected to grow after three days of its application!

Sushruta: In patients of wounds and ulcers, *patola* forms a wholesome, nourishing and healing culinary vegetable. Any preparation from this vegetable is good.

Besides the use of this *patola* as single drugs, there are many ayurvedic compound formulations where it enters as an important ingredient of the *yoga*.

(vi) **Trichosanthes nervifolia** Linn.

Names

This is called *potol* in Bengali; *palval, parvar* in Hindi; *podlakayi* in Kannada; *patolam* in Malayalam, *kombephudalai* (a horned *padawala*) in Tamil; *kommu potla* in Telugu.

Botanical Description

This is a perennial (i.e. living for many years) climber with stems that are rather woody below. It is much branched and the branches are slender, non hairy and straite with longitudinal lines all along. Leaves are 5-10 ly 2.5 - 5.7. cm, ovate-oblong in shape and again not lobed unlike other members of the genus but as found in T. *dioica*. The tip is acute, and mucronate, with a sharp stiff pointed projection. The margins are minutely and remotely teethed. Surface of the leaf is non-hairy and smooth on both the sides, dark green above and rather pale below. The base is heart shaped. There are three main nerves on the leaf blade

springing from the leaf base, the two laterals not quite reaching the apex but with strong secondary nerves on the outside; the lowest pair of the secondary nerves prominently branching into the basal lobes of the leaf on either side of the heart shaped notch (hence called *nervifolia* as nervis sum to spread every-where). Male flowers occur in axillary clusters. Petals are prominently fringed. Female flowers are solitary, not occurring in clusters and have short stalks.

Fruit is 3.8 - 7.5 cm long, ellipsoid, shortly beaked (as the Tamil name points out), tapering at the ends, green with white lines when unripe but become scarlet red on ripening.

Seeds are semi-ellipsoid compressed, thickened at the margin. A scarlet pulp of the placenta encloses every seed, characteristically.

The plant is essentially South Indian in its distribution and is found growing well in Konkan Coast, Coorg, Nilgiris and Pulney Hills besides Bengal and Sri Lanka.

Medicinal Properties

The plant is a bitter tonic and is found to be useful in warding of fevers. The root is a purgative. Its medicinal properties and uses are very much like those of *T. dioica*.

The fruits are used extensively and only externally in epilepsy and mental troubles.

2. Alabu (*lauki* in Hindi or Bottle Gourd or Calabash in English)

Other names in English are: White Pumpkin, Benares Pumpkin, Long White Gourd; Bitter Bottle Gourd. Botanically it is called *Lagenaria vulgaris Ser.*

Names

This is quite a well known plant. Sanskrit calls it by many names, the most popular one being *alabu.* Others are: *brihat phala* (large fruited), *dantabija* (seeds stuck in the pulp of the fruit like teeth), *ikshvaku; katukalabu, katu tumbi* (the bitter in taste); *lamba* (elongated, pendulous-fruits) *pindaphala* (a massive fruit) and *tikta bija* (seeds are bitter).

It is called *kodalau, tiktalau* in Bengali; *dudhi, dudio* (the milky white), *kadvi tumbadi, tumada* in Gujarati; *golkaddu, kadutumbi, kashiphal, lauki* in Hindi; *sore kayi, halu kumbala* (the milky pumpkin) in Kannada; *bella shora* in Malayalam; *bhopla, dudhya, kadu bhopla* in Marathi; *golkaddu, lauki, tumba* in Punjabi; *sorakkai* in Tamil; *alaburu, gubba kaya* (a bloated vegetable), *sorakaya* in Telugu; *kadugol, tumbari* in Urdu.

Botanical Description

This is a large softly hairy climbing or trailing herb. Stem is stout and 5 angled. Tendrils are branched into two. Leaves are often 15 cm in diameters, ovate or rounded, with a cordate or

heart shaped base and a dentate or toothed margin. They are 5 angled or 5 lobed, hairy on both the surfaces. Leaf stalk is long and has two glands at the top. Flowers are large, white, solitary and unisexual, but they may occur in the same plant or in two separate plants, male and female. Male flowers have 5 free petals that are crumpled and hairy on both the sides. Female flowers resemble the male in their calyx and the petal.

The fruit is large, usually bottle or dumb-bell shaped and massive. It is soft walled to start with but becomes almost woody at maturity; the shape of the fruit varies very much, as well as the length. Seeds are numerous, white and laterally compressed with a groove at the margin and are smooth. They are quite oily.

The plant is said to be a native of India, Moluccas and Abyssinia. It is a very popular vegetable all over India and well cultivated. It also occurs in a wild state.

Medicinal Properties

There are distinctly two varieties: sweet fruited and bitter fruited. Except in this taste of the fruit, the two varieties resemble each other in all ways.

(i) *Sweet Fruit Variety*: The stem is sweet in taste and laxative. It cures biliousness but causes bronchitis and flatulence (distension of stomach or bowels caused by gases during digestion). Leaves are laxative. The fruit is sweet, oil containing,

cardiotonic and a general tonic as well. In addition, it is aphrodisiac (increasing the sex urge), laxative, cooling and fattening. It increases *vata* aggravation, improves taste and cures lecuorrhoea (the whites) and biliousness. It is wholesome to the developing foetus and therefore well advised for the pregnant women, as a very salutary diet. But the fruit is not easily digested and is somewhat toxic to the liver. It is useful in healing the wounds and cures blood diseases of persons with a hot constitution. It is a curative of muscular pain and distressful dry coughs. The rind of the fruit is good for piles. The ash of the fruit is styptic (stops bleeding) and heals the wounds. The seeds are good for persons with a hot constitution.

The Sanskrit term *alabu* mostly refers to the sweet variety while the bitter one is called *tumbi, katutumbi.*

(ii) *Bitter Fruit Variety*: The leaves are diuretic and good for bilious troubles. They are toxic to the liver and are useful in leucorrhoea, complaints of the vagina and the uterus and also in ear ache. The fruit is bitter, hot and pungent; it causes vomiting, but is cooling, cardio tonic and counter active of *pitta* aggravations. It cures asthma, *vata*, bronchitis, inflammations, ulcers and pains. The roots mitigate inflammation. The flowers are cooling and are good for eye diseases and tooth ache but cause haemoptysis i.e. spitting of blood from lungs. The fruit is very bitter and good for bronchitis. The seeds induce vomiting.

(iii) *Long Fruit Variety*: The fruit is sweet, diuretic and counteracts fever and *pitta dosha*.

According to the Yunani physicians, the seeds are fattening, diuretic, cooling and also a tonic to the brain. It cures cough, fever and ear-ache and lessens the chances of inflammations and is thus a preventive drug.

The seeds of this plant in general yield an oil which is applied as a curative to head-ache. The flesh of the fruit is regarded as diuretic, cooling and antibilious. Sometimes it is made into a poultice; this is bitter and purgative when fresh and is then applied over the shaved head for patients of delirium—a wild excitement of the brain often accompanied with convulsions in the body and tremors. In Punjab, the pulb is applied to the sole of foot when there is a burning sensation. The pulp of the bitter variety is a powerful emetic (vomit inducing) and also a purgative drug very much like colocynth.

Parts used: Seeds, seed oil and pulp of the fruit.

Fruits and leaves are edible; leaves are slightly purgative. Fruit of the sweet variety is cooling, diuretic (induces profuse urination) and acts against most disorders of bile, very much like colocynth. Seeds yield a clear, limpid oil which is cooling and forms an emolient (softening) application on the head for securing relief from headache. It is also given internally.

Pulp of the sweet variety forms a base for making various sweet-meats and confections like that of the Ash Gourd (*petha*). It is beneficial in coughs and acts as an antidote to certain poisons and specially for scorpin stinging. In cases of delerium, its paste is applied over the shaved head, as a cooling agent.

It is applied similarly for soles in cases of burning sensations of the feet. The pulp of the bitter fruit is burnt into ashes, mixed with honey and applied to the eyes as a curative agent for night blindness. Juice of the fruit is boiled with any sweet oil (like gingilee oil) in an equal part till the juice is all absorbed in the oil; this is a beneficial external application to scrophulous (tuberculosis of the lymphatic) glands. This is also recommended for application over the head in cases of delirium.

The rind and the seeds of the fruit are used in preparing *chutney*.

The bitter variety has many applications in medicine. A few of them as recommended by many classical authors are as follows:

Vagbhata: The powder of the seeds is mixed with honey and given in goat's milk for seven days. This will destroy urinary stones (*ashmari*).

Chakradatta: The juice of the pulp is mixed with *yavakshara* and given as a drink. This also destroys urinary stones.

Bhavaprakasha : Eating a sweet-meat (*modak*) prepared by adding honey and sugar to the dried powder of the fruit pulp is advised as beneficial in leucurrhoea.

Uterine diseases get cured by an application of a fine powder of equal parts of the leaves and *lodhra* mixed with honey as the medium.

Chewing the root and keeping it for sometime in the mouth will destroy all infections of teeth.

Harita: In oedematous swellings (*shotha*), boil this bitter gourd and *jatamansi* in rice gruel and give a fomentation with its steam over the affected region. The same may also be tied over as a poultice. Both measures are attended with success.

Freshly extracted juice of the pulp cures many diseases of the ear, such as oozing, dull pain and so on.

Shodala: For boils and eruptions, the roots and seeds are ground along with *conjee* and applied.

In the bleeding cracks at the feet (*bivai*), the seeds are ground with water and applied. Filling the cracks like this for three days will heal them fully and the sole of the feet will become soft like the tongue!

Modern opinion clearly regards the pulp of the bitter fruit as emetic (vomit inducing) and purgative just as the ancient authors had professed. The seed oil is useful as a cooling agent

in headache and is actually applied externally for this purpose. The pulp of the sweet variety is a good base for many types of confections. The seeds are strengthening (*balya*) and also diuretic, inducing profuse urination.

Yunani opinion: This is regarded as being quickly digested alright but not much nourishing in itself. It is diuretic, cooling, unctuous and a commendable mitigative of the violence of biliousness and the aggravations of blood.

The sweet variety is eaten alone or cooked with meat. This is a very compatible food for persons of bilious nature. Its use is advised in fever due to *pitta*, dry cough as well as comsumption and insanity and also melancholia (a depressive, psychotic sadness). In general however this is a fattening food stuff.

This vegetable however is not advised for persons of *kapha* constitution.

Seeds as well as their kernel are used in many afflictions: thirst, bilious upsettings, roughness of throat and lungs and dry cough. Their most important use is in insomnia (sleeplessness) and mental fatigue; it can be given then as a drink or as an external application. It is effectively beneficial in either ways.

Fresh juice extracted from the fruit of green bitter *lauki* is given with good results in chronic cough and asthma. It is also a good gargling material for tooth ache.

The general effect of the bitter variety is like that of colocynth. The pulp is very bitter and a drastic emetic as well as a purgative. Both vomiting and purging will start almost immediately, very similar to what is seen in a cholera patient. Given in very little dose however it clears the alimentary canal effectively and also the phlegm.

Oil cooked with its leaf paste is beneficial in goitre and glandular swelings. It is then used as an external application.

3. Dhamargava. This is ghia in Hindi and Sponge Gourd in English.

Botanically this comes under the genus *Luffa* which has about 5-6 species in India, all of which are famous in their respective fields mainly as kitchen vegetable fruits and some, as medicinals. They are also quite common all over India. In general, the fruit and the ripe seeds of the genus are violent purgatives and emetics (vomit inducing). We shall discuss a few important species as below:

(i) **Luffa aegyptiaca** Mill. Sponge Gourd. *ghia*

Names

The botanical term comes from the Arabic name *Luffa* and means that it is a *luffa* from Egypt.

The plant is a favourite vegetable. Sanskrit calls it by many names: *aibhi, dhamargava; brihat koshataki, hasti koshataki, raja koshataki* (the

large sized, elephantine or king *koshataki* which is *torai* in Hindi); *dirgha patolika; ghoshaka, hastighosha; mahaphala* (with a big fruit), *maha pushpa* (with a big flower) and *sapitaka* (the yellow flowered).

It is called bhatkerela, bhol in Assamese; *dhundul, hastighosha* in Bengali; *turia, galaka* in Gujarati; *tuppa hire* (ghee like *turai* referring to its fruit pulp consistency) in Kannada; *ghia, ghia tarui, nenua, purula* in Hindi; *ghada ghosai, ghosali, paroshi* in Marathi, *ghiatori, ghigandoli* in Punjabi; *pichukku, pikku* in Tamil; *guttibira, netibira* in Telugu and *turi* in Urdu.

Botanical Description

This is quite a vigorously climbing plant reaching to considerably great heights. Stem is stout, 5 angled, twisted, non-hairy and smooth or slightly hairy. It is often very rough or scrabrous at the angles. Tendrils are usually divided into 3 branches. Leaves are round and kidney shapped, 10-20 cm long, often broader than long, and lobed like a palm usually into 5, rarely 7 parts. Individual lobes have an acute tip and the margin is teethed distantly. Both the surfaces of the leaf are finely scabrid or rough with projecting points. Leaf blade shows many spots all over; it is hairless excepting along the ribs beneath where it is hairy. The base is deeply heart shaped. Leaf stalks are long, angular and slightly scabrid. Flowers are unisexual. Male flowers occur in axillary recemes with 4-20 flowers in a cluster. Petals are spreading,

yellow and show green veins within their texture. Female flowers are solitary and usually occur in the same axils as of the male flowers.

Fruit is 12.5 - 30 cm. long , cylindical or some what three angled but the surface is smooth, darkish green unlike *turai*, where it is distinctly ribbed and light coloured. It is blunt at the end and marked with longitudinal lines (and not the ribs of *turai*). The pulp of the fruit is of a more homogenerous consistency, ghee like as its name in Kannada connotes. Seeds are black or grey. 10 by 6 cm, much compressed laterally or even winged narrowly, usually smooth but rarely minutely warty.

The plant is cultivated all over the greater parts of India as well as in Africa and America. This is believed to be a native of India, in the Indian Archipelago and North Australia.

Medicinal Properties

Ayurveda considers the fruit as oily and laxative. It removes *vata* as well as *pitta doshas* and is found useful in leprosy. This is an excellent, wholesome vegetable for persons of hot constitutions and for patients of diseases due to heat.

Yunani physicians recognise three varieties in the fruits. They are all recognised as excellent tonics and curatives of biliousness, splenic diseases, leprosy, piles, fever, haematuria (blood being released along with urine), syphilis and also bronchitis.

The seeds are emetic and purgative.

In Vietnam the fruit is prescribed to women after child birth to increase milk production. It is mostly used as a diuretic in Cambodia. The young fruits are applied as poultice to tumours in Guiana.

(ii) **Luffa acutangula** Roxb. *Turai* Sponge Gourd

Names

Sanskrit gives many names for this plant also:

They are *dhamargava; krita vedhana* (with a hole ready made in the fruit), *koshataki* (case like), *jhingaka; saptaputri; dharaphala;* (fruits with sharp edges) *laghu koshataki; pita pushpa; raja koshtaki, jalini* (net work of fibres) *rajimat phala; supushpa* (good flowered) *svaduphala* (sweetish fruit) *sukosha.*

It is called *jhinga, jinga, sataputi* in Bengali; *ghisoda, gonsali, turin* in Gujerati; *jinga, sataputi, torai, torai, turi* in Hindi; *hire kayi* in Kannada; *dinjil, putchenggah* in Malayalam; *dodaki, sataputi, shirola* in Marathi; *peekankai* in Tamil; *torai* in Urdu and *janhi* in Uriya.

Botanical Description

The creeper climbs to a considerable height over other neighbouring plants. Stem is 5 angled, smooth and non-hairy; the angles are sharp and often very rough. Tendrils are usually divided into 3 branches. Leaves are rounded, pale green, 15-20

cm long, equally broad, palmately (i.e. hand like) 5-7 angled or divided somewhat into as many lobes. They are rough on both the sides; base is heart shaped, nerves and veins are prominent beneath. Even the leaf stalks are rough and angular. Flowers are male or female, both occuring on the same plant. Petals are 2cm long, spreading, yellow and with green hairy veins.

Fruit is 15-30 cm long, club shaped, oblong, tapering towards the base, very obtuse at the apex, longitudinally ribbed (almost winged) with 10 sharp angles (hence named *acutangula*); seeds 13 by 6-8 mm, ovoid-oblong, much compressed, slightly corrugated at the sides, not winged and black or dull brown in colour.

The plant is believed to be a native of India and in the Malay Archipelago. It is cultivated in most parts of India

Medicinal Properties

The fruit is sweet, oily and cooling. It counteracts round worms, fever and is good for stomach. It cures liver troubles, asthma and bronchitis. But it causes *kapha* aggravation and flatulence (viz. gas collection). Leaves are also stomachic (good for stomachs) and act against *pitta dosha* and fever. It is a cure for bronchitis.

Yunani physicians consider its medicinal properties and uses as being the same as that of *L. aegyptiaca.*

Seeds are emetic and purgative; they also yield an oil.

Leaves are pounded and used as a local application to the out growths of piles and leprosy. The juice of the fresh leaves is dropped into the eyes of children in granular conjunctivitis as well as to prevent the eyelids adhering at night because of excessive meibomian secretion. In Cambodia the pounded leaves are applied in ring worm.

(iii) **Luffa acutangula** var. amara. Clarke

This is a bitter and wild variety of the above plant.

Names

Sanskrit gives many names even for this plant: *ghantali, jalini* (referring to its spongey fibrous network), *karkashacchada* (rough leaved), *katukoshataki* (the bitter variety), *krishna* (the black), *kritacchidra, krita vedhana, kshveda, mridangaphala* (fruit, like a drum), *sushodani; tikta, sutikta, tikta koshataki* (the pungent variety).

It is called *ghoshalata, jhinga, tito dhundul, tito jhinga, jhumkhadan, kadvi ghosodi* in Gujarati; *jhimani, karvitorai* in Hindi; *kadu hire, nagadali balli* in Kannada; *athanga* in Malayalam; *kadu shirali, ranturai* in Marathi; *pey ppirkam* in Tamil; *adavibira* in Telugu and *bandal* in Urdu.

Botanical Description

The plant resembles *L. acutangula* in most respects. Only the leaves are smaller, and are at

first whitish and softly hairy, later becoming green and rough. Flowers are also smaller and so are the seeds.

Fruit is obovoid, obtusely conical at both the ends (as in a *mridanga* or the drum), 5-10 cm long by 2.5-3.8 cm thick, 10 ribbed and bitter.

The plant is a wild climber common throughout India, specially so in Western Peninsular India and Sri Lanka.

Medicinal Properties

The plant is slightly pungent, acrid and bitter in taste. It is laxative, carminative and digestible; and, is a tonic to the intestines. It cures *vata* and *kapha* aggravations, anaemia, liver complaints, jaundice, leucoderma, piles, inflammation, bronchitis, ascites (dropsy or water collection of the abdomen, *jalodara*); tumours, tubercular glands and the tumours of uterus and vagina. It is useful in rat bite. The fruit destroys bad taste in the mouth. It is used in urinary disorders, fever; bronchitis and asthma. Both the leaves and seeds are used as errhines (i.e. as a nasal drop) in curing headache.

Yunani physicians recognise two varieties of fruits, white and yellow. They are both bitter and sharp in taste and are used as curative in fever, cough and asthma and piles. Seeds correct the absence of menstrual flow in amenorrhoea.

The fruit is violently purgative and emetic. The pulp is given with water in the bites of dogs and other animals to expel out the toxic materials. The juice of the roasted young fruit is applied to cure headache. The dried fruit is used as a curative snuff in jaundice.

The ripe seeds are used as an emetic or as a drastic purgative either as such or in the form of an infusion. In small doses they help in expelling phlegm by means of cough (viz they are expectorant) and cooling. The kernel of the seeds is usefully employed in dysentery. Its dose as an emetic is 20-30 grains, as a nauseant 11-15 grains, as a *demulcent* (a soothing drug) and expectorant 5-10 grains.

The whole plant possesses laxative and purgative properties and is also reputed to be beneficial in skin diseases and asthma. A decoction of 1 in 10 of the fruits or twigs is administered in asthma to secure a relief by causing profuse expectoration.

The seed has a fixed oil i.e. non volatile oil that is rather bland in taste. The oil is densely brown or reddish in colour.

In the dried rind of the Luffa fruit there occurs a bitter principle called luffein similar to colocynthin of *Citrullus colocynthus*.

The pulp of the sweet *Luffa* is very light for digestion and is also a cardiac tonic. It is therefore a wholesome vegetable for persons recovering from sever attack of fever, recently.

Modern opinion confirms *Luffa* as being bitter, stimulative of digestion, diuretic as well as purgative. It purifies, cleans and also heals the wounds. The kernel of the seeds is infact regarded to be similar to the famous ipecacuanha drug in action. Its cold decoction is very beneficial in cleaning and healing of even rotting ulcers. Tissue regeneration is augmented by its application. As such, the plant is an admirable addition to the stock of household remedies.

Many classical ayurvedic authors have referred this plant in connection with several diseases. A few examples are as below:

Charaka: The seed oil of mustard, *karanji* (*Pongamia glabra*) and the bitter *Luffa* is beneficial in leprosy.

Chakra datta: The polyp like growths of piles fall down by an application of the powder of the dried roots of this plant.

For very chronic piles, the advise given is: secure an ash by burning the five organs (root, leaf, stems, fruit and seed) of this *plant, boil a brinjal in its water,* roast this brinjal in ghee and add jaggery. The patient should eat this, as much as possible and drink butter milk upon it. By this measure, the haemorrhoids of piles will get destroyed however persistent they may be.

Taking the juice of the fruit in the form of a nasal is advised in jaundice.

A similar nasal administration of the juice of the fruit mixed with the juice of *pippalimul* is advised for patients of goitre.

Shodala: In all kinds of skin afflictions, fill up the hollow of a dried bitter *Luffa* with water, keep it overnight and let the patient drink one *tola* every time of this water immediately after cleaning the teeth. A drink like this continued for a few days will destroy any type of skin diseases.

For rat poisoning, a decoction of the five organs of this plant is advised as beneficial.

Modern opinion: Among the Indian medicinal plants, this is the only drug which resembles the famous vegetable emetic (vomit inducing) drug of ipecacuanha in equal efficiency in all ways. Its dosage is also like that of the latter. Given in small doses, its oily and albuminous seeds destroy phlegm or *kapha*. The seed oil has a very efficient action in relieving sprains- an aspect worth being better utilised than at present.

Luffa acutangula and *L. aegyptiaca* are also called the vegetable sponges as their fruits yield a unique fibrous material - a lacy net work of stiff curled fibres which will occupy almost the whole of the fruit on maturity. This resistant fibre is extracted by retting the fruits under water for a considerable amount of time. After cleaning, this is used for making hats, for washing and scouring machinery, in some types of oil filters and also as a substitute for bath sponge. Japan was once exporting this material in large quantities.

(iv) **Luffa echinata** (shiny) Roxb

Names

The names in Sanskrit are: *akhuvishaka* (used in rat poison), *vishaha*, *vishaghni* (remover of poison), *chaturangaka*, *deodalika*, *lomasha patraka* (leaf hairy), *pita*, *tarkari*.

It is named *deytada* in Bengali, *kukarvel* in Gujerati; *devadali* in Marathi; *visha hire* (the poisonous *turai*) in Kannada; *panibira* in Telugu and *kukar vel* in Urdu.

Botanical Description

This is not an extensive climber unlike the other members of the genus *Luffa*. Stem is slender, furrowed on the surface and smooth, non-hairy. Tendrils are divided into 2 branches. Leaves are 3.8 - 6.3 cm. long, usually a little broader than long, kidney shaped or more or less round. The base is broadly heart shaped, leaf blade is faintly 5 angled or somewhat deeply 5 lobed; the margin is having minute teeth. Leaf stalks are striate, hairy and sometimes rough. Flowers are male or female and usually occur in two separate plants. Petals are white, spreading out and veined.

Fruit is broadly ellipsoid, 2.5-3.8 by 1.3-2 cm in dimensions, not ribbed but clothed with bristles (the "spines"). Seeds are numerous, not winged and slightly warty.

The plant is common everywhere in India and is also found in Burma and Abyssinia and tropical Africa.

Medicinal Properties

There are three kinds—all having similar medicinal properties. The plant is bitter in taste and hot in quality. It is emetic and anthelmintic and cures anal diseases, inflammations, bronchites, jaundice, fever, asthma, anoemia, piles and consumption. It is good for rat bite and also destroys bad taste in the mouth. The root is laxative and analgesic (a pain killer). It cures tumours, bronchitis, piles and jaundice.

Yunani physicians consider that the root strengthens muscles of the neck and is a tonic to the hair. The fruit is curative for chronic bronchitis and lung complaints.

In Konkan region, a few grains of the fibrous pulp of the fruit are given in infusion during cholera after each stool. It is applied over the head and also given internally in jaundice. The infusion is reputed to relieve colicy pain (the twisting pain of the stomach). In North India, the fruit is considered as a powerful remedy for dropsy (*jalodara*).

Classical references to this plant are many. A few of them are as follows:

Charaka: Administering cold water with the fine powder of the five organs of this plant (root, leaf,

stem, fruit and seed) will destroy fever due to biliousness as well as fever due to *vata* or *kapha*.

Sushruta: Drinking of the powder of the fruit along with curds is advised in rat poisoning. Immediate vomit will ensue and the poison will get expelled.

Vaidya manorama: Drinking a *tola* of the powder of the flower along with milk is beneficial in child birth. There is no medicine to equal this for the purpose !

Shodala: Drinking in morning, of the water in which the five organs of the plant are soaked overnight is destructive of jaundice.

For all contagious diseases, application of the powder of the root or seed well mixed with vinegar will act as preventive and curative.

In leucorrhoea, drinking of the root ground in rice water mixed with a little honey is beneficial.

Modern opinion: *Devadali* is a very successful and unfailing medicine in all cases of oedema, morbid swellings and also enlargements of spleen and liver. It can be administered in the form of tincture, decoction or cold infusion. For cleaning indolent ulcers and even gangrenous (rotting) wounds, this forms a good and effective lotion; the results are always satisfactory. For headache and any pain in the forehead, application of its cold infusion in the form of a nasal snuff is remarkably beneficial. There will immediately issue forth excessive flow of discharge from the nasal mucous

membrane; the relief secured is commendable. 10-15 drops of the decoction would be adequate. More than that would infact be having adverse reactions. The medicine is very useful in enlargements of liver and spleen. But one should always be careful about the dosage. It is effective in infantile cirrhosis of the liver among the children. In initial stages of liver enlargement, this is an unfailing remedy. Because of its purgative and diuretic action, this drug has proved a beneficial agent in many cases of oedematous afflictions. Actually, this is considered the best among such curatives (for all oedemas) that carry out their action by causing profuse urination.

Drops of the decoction of its fruit placed in the nose will bring forth excessive yellowish discharge; this is presumed to be a good remedy for jaundice. But such a measure should not be resorted to in case of patients of weak constitutions.

Taking in a fumigation of the fruit through the nose is believed to be effective in shrinking the haemorrhoids of piles!

4. Karavella (Karella in Hindi. The bitter Gourd in English)

The bitter Gourd or *karella*, famous as well as popular, both as a vegetable and a medicinal plant comes under this genus. There are about five species in this genus which are all of considerable importance. They are closely related to Karella and quite often regional languages regard them as being a "variety" of it, as it were. These

are *M. charantia*, *M. balsamina*, *M. dioica*, *M. cochinchinensis* and *M. tuberosa*. We shall discuss them as below.

The fruits and seeds of the genus in general are violent purgatives and hydragogues (i.e. powerfully drawing forth water from the tissues).

(i) **Momordica charantia** Linn. *Karela*. The bitter Gourd

Names

Sanskrit offers many a name for this plant: *toyavalli, ambuvallika;* (the watery creeper); *brihadvalli* (a great climber), *chirapatra, kanda kantaka, kandura, kantaphala* (fruit spiny), *karavali, karavellaka, karavelli; kathilla, kathillaka, krimighna* (destroying worms); *pitapushpa* (flower, yellow); *sukshma valli*, (a tender creeper); *sushavi* (a hollow - fruit).

It is called *kakiral, kakral* in Assamese; *baramasiya, karala* in Bengali; *karela* in Gujarati; *karela, karola* in Hindi; *hagala kayi* in Kannada; *kaippa, pavakka cheti* in Malayalam; *karale* in Marathi; *pavakka* in Tamil; *kakara, tellakakra* in Telugu; *karella* in Urdu and *karena* in Uriya.

Botanical Description

This is a considerably extensive climber but with long much branched stem. It is more or less hairy; young parts are profusely softly hairy. Tendrils are simple, slender, elongate and hairy. Leaves are almost round in outline, 5–12.5 cm. in diameter,

hairy or slightly hairy on either side. Base is heart shaped and the blade is deeply divided into 5-7 lobes. The lobes are acute with a small pointed apex and usually constricted at the base, the gap between them being narrow and divided further in turn. Leaf stalk is long, channelled and hairy. Flowers are male or female but both are found in the same plant i.e. the plant is monoecious. Male flowers are solitary, furnished with large kidney shaped or rounded bract. Petals are lemon-yellow, obtuse-tended and veined. Female flowers also have the prominent bracts.

Fruit is green for a long time (when it is plucked and used) and bright orange when well ripe but almost reddish when fully mature. It is 5–15 cm. long, pendulous, fusiform (pointed at both the ends), usually pointed or beaked. Characteristically it bears numerous triangular wart like but soft projections (such as in a crocodile's back). When mature, it opens in 3 valves at the apex. Seeds are compressed and corrugated at the margin.

The plant is a well cultivated garden plant all over India and also occurs in China, Japan, Tropical Africa and America.

Medicinal Properties

Quite a host of medicinal properties are attributed to *karela* by all traditional systems of Medicine, Ayurveda, Yunani and Siddha.

The root is used in eye diseases and where there is a prolapse (a falling down or displacement) of

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The root is used in eye diseases and where there is a prolapse (a falling down or displacement) of

vagina. The fruit is bitter, cooling, digestible and laxative; it brings down fever, kills worms and is an appetiser. It cures liver complaints, diseases of blood, aggravations of *kapha*, anaemia, urinary disorders, brochitis, asthma and ulcers. The juice is useful in cholera.

Yunani physicians also consider the fruit as very bitter; in addition, they regard it as a tonic, stomachic (good for stomach), and causing an increase in the urge of sex and a killer of worms. It is astringent (contractive and healing) to the bowels but laxative if there is a bleeding accompanying with it. It is used in syphilis, rheumatism, troubles of the spleen and in eye diseases.

In Konkan coast 1/8th *ser* of the juice of the leaves is given in liver complaints as an emetic (an vomit-inducer) and a purgative, alone or along with some fragrant substances to render it palatable. The juice is rubbed in burning sensations of the soles of the feet. Along with black pepper it is similarly rubbed around the orbit of the eye as a cure for nigh blindness, where the patient cannot see in the night but can very well do so during the day. Internally it is used as a laxative and as an ointment for sores in general. Both the fruit and the leaves kill worms and are also useful in bleeding piles. The juice of the fresh leaves is a mild purgative and is therefore prescribed for children.

The freshly extracted juice of the plant along with a little bit of chalk is a cure for apthae (circular white sores in the mouth cavity). It is also given internally to cure disorders of menstruation. It is applied over the scalp when there is an eruption of pustules over it. Mundas of Chota Nagpur value the fruit as a very good drug for stomach. In China, the fruit is regarded as a tonic; a ripe fruit however is considered as a drastic purgative. In Guiana, the ripe fruit with the seeds discarded is macerated in sweet almond oil and used effectively in healing the wounds. An infusion of the fruit is beneficial in treating a crushed or a bruised wound. The pounded leaf along with any bland fatty substance forms an useful ointment for scabies and other skin diseases.

In Cambodia, the leaves are considered as effective in bringing down a raging fever. They are given by the local physicians in cases of delirium or violent mental upsets accompanied with wild excitement. In Gold coast the plant is used as a cure for fever. This is done so in the form of water for bathing, or to drink with water or most commonly given along with palm wine to gulp in. The leaves are crushed and steeped in water which is then given internally as a remedy in diarrohea and dysentery. This water is also used as a healing enema because of its astringent property. Another reputed use of the plant is that it is actually employed as a sexual tonic and in large doses as a cure for the veneral disease of gonorrhoea.

Varied references occur in many classical ayurvedic authors on *karavella*. A few of them are as follows:

Sushruta: An oil prepared with a decoction of the fruit destroys gout. This is used as an external application.

Shodala: Grind the root in the urine of horse and apply it for the eye. This will destroy an eye disease called *nili*.

Rajamarthanda: In cases of prolapse of the uterus, grind the root and place its paste inside the uterus. The latter will recede to the normal position. Another measure is to apply an ointment prepared by crushing and grinding the root in water.

Chakra datta: For a patient of fever, the most wholesome curry is the one prepared with *karela*;

(In fact, because of its bitterness any preparation of the vegetable of *karella* is advised to be taken at the very commenument of the meals. The bitterness will induce secretion of much digestive juices and is therefore always considered to be salutary for all persons let alone the patients of fever).

Bhavamishra: A very good and household remedy for cholera is to secure fresh juice of the *karela* fruit, add to it a little quantity of gingiley oil and give this mixture as a drink to the patient. Cholera is sure to disappear.

Modern work

A chemical analysis of the fruit of *karela* reveals its richness. The contents are: water 83.2, protein 2.9, oil content 1.0, carbohydrate 9.8, fibre content 1.7, mineral substances 1.4 per cent, calcium 50, phosphorus 140, iron 9.4 per 100 grams, carotene (in the form of vitamin A), 210 international units; thiamin 7.2, nicotinic acid 0.5 mili., riboflavin 90, ascorbic acid 188 mili in 100 gram; and a little per cent of copper also is found. Potassium is 282 mili in 100 gram.

Karela contains ascorbic acid in great abundance (upto 188 miligram per 100 gram). As long as the fruit remains green this much percentage remains safe; but it gets reduced to almost half on maturity. Boiling the fruit also reduces it by 40 per cent; so does it happen to the thiamin content. Even drying in sun will reduce it by 80 per cent.

Even the tender leaves of karela is a good vegetable for the kitchen. In Java and Philippines they are actually used as a seasoning, aromatic adjunct. Leaves contain calcium, carotene, riboflavin and ascorbic acid in considerable richness. Seeds of *karela* yield a rich amount of oil. Flowers and fruits contain two kinds of alkaloids, one of which is myordicine. Root is also bitter and contains a glucoside as well as a gum. Seeds contain a powerful germicidal principle apart from the alkaloid.

Karela however is famous for its effect on diabetes melitus or *madhumeha*. Its flowers, fruits as well as leaves are used for this purpose. Quite commonly diabetic patients do drink the fresh juice of a whole fruit. A similar fame for diabetes exists in Phillippines and Porto Rica. Giving its juice experimentally to rabbits has shown a lowering down of blood sugar level. However some side effects of toxic nature have also been seen. In man its profuse use is believed to give rise to a risk of causing abortion. Nonetheless trials of obviating or removing this toxic element is always welcome.

There is a wild karella whose fruits are smaller and rather globular. In South India, specially Tamil Nadu another cultivated variety of *karela* occurs whose fruits are quite small, rather bloated up, while the creeper itself is essentially spreading rather than a climbing plant and produces its fruits in great profusion. Both are well liked and popular vegetables for the kitchen. Their medicinal uses are quite similar to the more common cultivated variety where the fruits are comparatively big-sometimes quite huge, specially in the choice cultivated life forms. It is nice if these lesser known varieties of *karella* are brought into greater popularity all over.

Yunani physicians regard that *karela* is beneficial in rheumatism, *vatarakta* as well as *amavata*. This is digestive and also strengthening according to them. It is beneficially employed in diseases of the spleen and the liver. Simultaneously this is a germicidal drug.

A common household medication is administering the juice of the fruit for children for its germicidal and purgative effect.

(ii) **Momordica balsamina** Linn. *Mokha* in Hindi. Balsam Apple and Balsamina in English.

Names

There are no names for this plant in Sanskrit.

In Hindi, it is called *mokha* which is an Arabic name; in Gujarati it is *chhochhidan*; and in Kannada *hucchu tonde balli* (a mad creeper of *tonde*, which is *Coccinia* or *tondli* in Hindi).

Botanical Description

The plant is a considerably extensive creeper. Stem is very slender, much branched, grooved, and more or less smooth. Tendrils are simple, unbranched, filiform (i.e. wire like and thin) and hairless and smooth. Leaves are membranous, round, with a heart shaped base having a rather broad notch. They are palmately lobed into 3-5 parts, going down upto the middle of the leaf; The lobes are rhomboid and have minor deep lobes in turn. They are all acute and mucronate i.e. with a sharp, projecting spine at the apex. Flowers are male and female, both occuring on the same plant.

Fruit is 2.5 - 7.5 cm long, ovoid, narrowed at both the ends, fleshy, smooth or muricate i.e. with rough and warty or with short and sharp points. Seeds are ash coloured, ellipsoid, compressed and

minutely wrinkled on the lateral flat surface. They have a grooved margin that has small warts at the edges.

The plant grows wild in many parts of India, West Asia, Malaysia and Australia.

Medicinal Properties

The fruit is used only occasionally as a medicine in India.

But it is a very famous drug in Syria for curing the wounds. It is cut open, made into an infusion in a sweet oil, exposed to the sun for a few days till it becomes red in colour and is then preserved for use when the occassion arises. This is then dropped on a swab of cotton and applied to fresh wound. It is regarded as a very good and sure healer but a little inferior in this respect to the famous balsam of Mecca. It is because of this reason, the plant is called Balsamina.

In French Guiana it is used for all the purposes to which *M. charantia* is employed.

(iii) **Momordica dioica**

This is quite a familiar plant and a much reputed drug in Ayurveda. Sanskrit authors give a large number of names: *avandhya* (unfailing), *bhaktadamani* (digestive?); *bodhanajali, bhutapaha* (active in psychotic states); *devi, diva, ishwari* (divine); *kandavalli, kandashalini; kanta* (spiny) *karkotaki* (very bitter), *mahajali, mahajalinika,*

manasvini, nagahantri, nagarati, nagari (an enemy of snake), *nakra damani* (mitigative of the stupor caused by poisons) and *yogeshwari* (the best of the formularies).

It is called *kantola, kantoli* in Gujarati; *beksa, ghosalphal, golkhandra* in Hindi; *midi hagala, gidda hagala* (the smaller, the dwarfish karela), *kartikayi, karchi balli* in Kannada; *erimapasel* in Malayalam; *banzakastoli, kastoli* in Marathi, *dharkarela, kirara* in Punjabi; *paluppakkay* (milky karela), *tumbai* in Tamil and *agakara, potkandulu* in Telugu.

Botanical Description

This is a perennial (living for many years) creeper with underground roots that are tuberous. Stem is slender, branched, furrowed, smooth, non-hairy and shining. Tendrils are simple, unbranched, elongate, striate (having longitudinal lines on the surface, smooth and non-hairy. Leaves are membranous, broadly ovate but much variable in shape. Leaf base is heart shaped, blade is hairless, more or less deeply divided into 3-5 lobes, individual lobes being triangular, ovate or oblong, with minute spots (punctate). The margin is teethed but distantly. Leaf stalk is channelled above and slightly hairy. Male and female flower occur in two different plants.

Fruit is 2.5 - 6.3 cm long, ellipsoid, shortly beaked, densely spiny, but the spines are all soft, fleshy and very much as in *karela*. Seeds are

minutely wrinkled on the lateral flat surface. They have a grooved margin that has small warts at the edges.

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Fruit is 2.5 - 6.3 cm long, ellipsoid, shortly beaked, densely spiny, but the spines are all soft, fleshy and very much as in *karela*. Seeds are

many, 1 cm long, broadly ellipsoid, slightly, compressed; surface is slightly and irregularly corrugated. They are found enclosed in a red, soft pulp of the placenta.

This occurs throughout India and ascends upto 5,000 feet in the Himalayas.

Medicinal Properties

This is a much extolled medicinal plant and also a favourite vegetable, specially in Gujarat.

Ayurveda recognises two varieties: (1) Fruit variety. The roots are beneficially used in troubles of head, urinary stones and as a nasal drop in jaundice. The leaves are stimulative of sex, worm killing and curative of the aggravation of all three *doshas, pitta, vata* and *kapha.* They are also found to be useful in curing fever, consumption, asthma, bronchitis, hiccup and piles. The fruit is pungent and bitter in taste and hot in quality. It is a laxative and good for stomach. It is also a curative for a number of diseases: asthma, bronchitis, fever, urinary disorders, excessive salivation and heart troubles. (ii) Fruit-less variety. The root is useful in elephantiasis. The plant is bitter and pungent in taste and hot in quality. It is used in curing the wounds and in most of the diseases to which the fruited variety is employed, eg. bronchitis, ulcers and the heart diseases and the like.

It is quite likely that these fruited and fruitless varieties of Ayurveda correspond to the female and

the male plants of this dioecious species of *Momordica.*

The roasted root is employed in stopping bleeding in piles and also in bowel complaints.

In Konkan coastland the juice of the root is a household remedy for the inflammation caused by contact with the urine of the house-lizard. The powder or an infusion of the root when used as a nose drop induces a powerful and copious discharge from its mucous membrance. The root tubers of the female plant are used in Belgaum as an expectorant (i.e. to expel the collected phlegm forcefully by induced coughing) and externally in burning fever (ague) as an absorbent. The root of the male plant is employed for ulcers especially those caused by snake bites. The unripe fruit is used as vegetable and given as a delicacy to patients recovering from fevers. The Mundas of Chota Nagpur use the root in urinary disorders. It is pounded and the paste is applied over the whole body to act as a sedative in high fever when the patient is excited wildly and is delirious.

Fruits are generally utilised as vegetable in the kitchen after boiling them twice; they are then very wholesome and likable along with the meals. They are very rich in Vitamin-C.

Juice of the fruit is a household remedy for irritation and inflammation caused by the urine of lizard as noted above. A powder or an infusion of the dried fruits applied to the nostrils acts as a powerful errhine or the nasal drug provoking

profuse discharge of the mucous. The mucilaginous tubers of the male plant which is larger than that of the male, are used as an electuary (a lickable medicine) to prevent bleeding piles and other haemorrhagic bowel affliction. Juice of the leaves mixed with cocoanut, pepper and red sandal wood forms an ointment whose application relives headache effectively. The powder of the root when applied to the skin renders it soft and supple and decreases its excessive perspirative tendency.

A few references from the classical authors to this plant are as below:

Sushruta: This is a very wholesome culinary vegetable for patients of fever.

Shodala: The root of the fruitless variety is ground fine with human milk, filtered and given as a nasal or an errhine drug. This is reputed to destroy even very advanced cases of elephantiasis.

The root rubbed in water and given to drink will remove snake poison.

The root powder is to be treated many times (*bhavana*) with goat's urine. It is then to be ground with *conjee* and given as an errhire. This is also a reputed drug in snake poison.

An errhine of the root removes jaundice.

Taking the fine powder of the root of this plant for ten days along with milk will expel out all types of urinary stones.

The root of the fruit less variety is generally kept preserved in the house by the villagers, as it is a much reputed counteracting drug for snake poison.

(iv) **Momordica cochinchinensis.** Spreng

Names

Sanskrit offers quite a few names for this plant: *gangeruka* (of the Gangetic plains) *karka, karka phala, karkataka; krindana: kshiddra patri, kshundramalakasandha* (a minor or an inferior "amalaka" like fruit), *mrigalendaka, mrigavit sadrisha* (smelling like the faecal matter of deer); *todana* (paining).

It is known as *gulkakra, kakrol, kataamala* in Bengali; *karapata* in Gujarati; *gangeru, gulkakra, kakrol, kathamala* in Hindi; *kakana* in Marathi; *adavi kakara* (the forest *kakara*) in Kannada and *kakrol* in Urdu.

Botanical Description

This is a strong and perennial (i.e. living for many years) climber ascending trees of the forest. It is a dioecious plant viz. there being two separate plants, male and female. The root is tuberous and the stem is robust, angular and smooth and non-hairy. Tendrils are simple, unbranched, stout, angular in section and smooth, non-hairy. Leaves are almost round, with a heart shaped base, smooth, non-hairy on both the sides. The margin

near the base is provided with stalked glands. Leaf blade is divided almost to the base into 3 or rarely more, deep lobes; margin of the lobes is entire or faintly toothed. Leaf stalk is stout, grooved, almost invariably having two glands at the middle and the apex, nearly smooth and non-hairy. Petals are white.

The plant is widely destributed all over India, Malaysia, China and Phillipines.

Medicinal Properties

The unripe fruit is sour and hot in taste and acts as an appetiser. It is astringent (and therefore healing) to bowels. It cause *pitta* aggravation. The ripe fruit is sweet, oily and acrid (pungently biting). It is laxative; and cures *vata* but causes *kapha* and *pitta* aggravations.

Yunani physicians regard the seeds as curative for cough and chest complaints. These are reputed to stimulate uterine discharges.

The seeds are also considered as good for cough and pains in the chest. They are powdered and used as a component of the hot stuff called *jhal* in Bengali given along with melted butter to women immediately after child birth. It is given so, daily for a few days thereafter.

In Indo China (modern Vietnam) the roots are given as a curative in rheumatism with swellings of the lower limbs. The seeds are used to hasten the maturation of boils and abscesses as well as the

swellings of the plague and thus resolve them. In China, the seeds are considered aperient or a mild laxative and is also used in treating tumours and cancerous ulcers. Besides, it is found to be effective in clearing the obstructions in liver and spleen.

(v) **Momordica tuberosa Cogn.**

Names

There are no name for it in Sanskrit or Hindi.

It is called *kadavanchi* in Marathi and Kannada.

Botanical Description

This is also a perennial climber like the above plant with a tuberous and woody root. But the stem is very slender and climbs rather poorly. It is striate and hairy sometimes but usually more or less smooth. Tendrils are thin and wiry, simple and unbranched and only slightly hairy. Leaves are rounded or kidney shaped, smooth or scantily hairy and have small spot like marks on both the surfaces, viz. they are punctate. Base is deeply heart shaped, leaf blade is obtusely divided into 5-7 lobes, the lobes being short and with an acute apex. Both the male and the female flowers occur in the same plant. Petals are pale yellow in colour.

Fruit is 2.25 cm long, pear shaped or broad and pointed at both the ends like a fish, narrowed into the curved stalk, fleshy and dark green, with 8-ribs

and sparsely hairy. Seeds are broadly ovoid and slightly compressed. The seed coat is polished and shiningly dark brown in colour.

In occurs mainly in Maharashtra and Karnataka States and Tropical Africa.

Medicinal Property

The tubers are used to procure abortion.

5. Irvaru (*kakadi, khira* in Hindi. Cucumber in English).

Botanically this comes under the genus *Cucumis* which includes four species that are all quite common all over India and very popular as well. They are all quite favourite vegetables and also useful medicinal plants. There are many more species for this genus outside India as it is well distributed over topical and subtropical regions of the world.

In general, the unripe fruit is emetic (vomit inducing) while the seeds are powerful diuretics (stimulative of profuse urination).

The four important species of the genus are as follows:

Cucumis trigonus (*gorakha kakadi*), *C. melo* (sweet melon, kharbuja), *C. prophetarum* (*khari indrayan*) and *C. sativus* (cucumber, *khira*).

We shall discuss every one of them individually now.

(i) **Cucumis trigonus** Roxb.

Names

Sanskrit gives a number of names to this plant:*bahuphala* (bearing many fruits); *chitra, chitraphala, chitravalli, vichitra* (fruit showing picturesque patters of colouration on its surface); *devi, godumba; kapilakshi, katphala; kumbhasi, laghu chirbita; maruja* (growing in sandy places) *mrigadani, mrigachirbita, mrigakshi, mrigervaru* (eaten by the deer; the deer cucumber-picturesque like deer?); *pathya* (wholesome) *shweta pushpa* (white flowered) and *vishala* (extensive).

The plant has names in many of our regional languages also. It is called *bangumak, gomuk* in Bengali; *kothiban* in Gujarati; *bhakura, bislambi, gorakha kakadi, jangli indrayan* (the wild indrayan which is *Citrullus colocythus*) in Hindi; *karita, shendada, takamake* in Marathi, *kachri, kakri* in Punjabi; *kattuttumatti* (the wild *tumatti*) in Tamil and *adavi puccha, kodibudama* in Telugu.

Botanical Description

This is a perennial, somewhat rough creeper. Stems are slender, angled and rough with short rigid hairs. Tendrils are simple, unbranched and the leaves are more or less round, 2.5-5 cm. long and broad, rather rough on both the surfaces, quite roughly hairy on the nerves beneath. Leaf base is heart shaped and the leaf blade is deeply lobed into 5-7 parts. The lobes are ovate-oblong or obovate, often narrowed at the base and rounded

at the tip. The margin may be broadly teethed or may show lobes in turn. The leaf stalk is slender, lined longitudinally and often roughly hairy. Both male and female flowers occur in the same plant. The petals are yellow.

The fruit is ellipsoid or more or less globose, 3.8 by 3.2 cm. and shows longitudinally disposed variegations with 10 green stripes. They are pale yellow when ripe and have a bitter pulp within. Seeds are white and ellipsoid.

The plant occurs throughout India mostly and also in Afghanistan and Iran as well as in Sri Lanka, Malaysia and Northern Australia.

Medicinal Properties

The green fruit is bitter and slightly sour. It is regarded as good for stomach and cures the aggravation of *kapha* and *pitta* but increases *vata*. The dried fruit is indigestible, astringent and healing to the bowels and cures *kapha* and *pitta doshas*. It improves the taste and relish in the food. The pulp of the fruit is very bitter and acts as a drastic purgative. For a mild and irritation free purgative action, a decoction of the roots and not the fruits is preferred. The seeds are cooling and astringent and are useful in liver complaints.

The Mundas of Chota Nagpur employ the pulp without the seeds to clear the stomach. It causes both vomiting and purging. The roots are crushed and along with any bland oil as a base rubbed on

the body in fever. In Malabar, the fruit is used to prevent insanity and to strengthen memory and also in curing vertigo or giddiness.

There are two distinct varieties of the plant, the wild bitter form (called *pahadi indrayan* in Hindi, the Hill Colocynth) which has smooth fruits with green and yellow streaks like colocynth and the softly hairy, semi cultivated form with velvety fruits that are sweet when ripe and are eaten as a vegetable when green.

The latter fruit is an appetiser and is useful in most disorders of the bile. The wild bitter fruits on the contrary are not edible but are used much the same way as colocynth or *Citurulus colocynthus.*

The seeds are cooling and are ground into a paste with the juice of *Cynodon dactylon* (the *durva* grass) and applied in the eruptions of the fever. There is a reputation in Malabar that the plant is alexipharmic (i.e. an antidote to poison) and possesses the power of removing pains and the aches. The fruit is pounded and boiled with milk and is then applied to the head. This is presumed to prevent insanity, strengthen the power of memory and remove giddiness of the head.

Modern investigations have shown that the properties of the plant are the same as that of the famous drug of Colcynth. A decoction of the root (1 in 70) is beneficial as a purgative; this is presumed to be milder in effect than the pulp of the fruit and causes much less of an irritation.

The drug also has a reputation of being used in snake bite.

(ii) **Cucumis melo** Linn.

The names in Sanskrit are: *amritahva* (nectar like); *dashangula, ervaru, karkati, khurbuja; madhupalla* (yielding a suggary syrup), *madhuphala* (sweet fruit; this is what the English term sweet melon indicates), *phalaraja* (the king of the fruits), *shadbhuja, shadrekha, shanmukha* (with six longitudinal lines or stripes); *tikta, tikta phala* (bitter fruited, as it happens in some varieties), *vritta karkatti, vritta ervaru* (round *karkati* or *ervaru*).

It is known as *katri, kharmuej, phuti in* Bengali; *chibdu, shakara teti, tarbucha* in Gujarati; *kachra, kakri, khurbuj, patkira, tuti* in Hindi; *Kekkarike* in Kannada; *chibunda, kharbuja* in Marathi; *kakharikayi, vellari kkayi* in Tamil *kurbuja dosa, pedda kay* in Telugu and *kharbuzah* in Urdu.

There are two varieties in this plant: *C. melo* var. *momordica* and *C. melo* var. *utilissimus*

(a) *Cucumis melo* var. *momordica*

Sanskrit calls this *chirbhita, chitraphala, dhenudugdha* (white like the cow's milk), *panduphala* (fruit, white), *ervaru, goraksha karkati, karka chirbhita, rochana phala* (a favoured fruit) and *pathya* (whole some).

Hindi calls it *kachra, phunt, phul;* Tamil, *kakarikkat;* Telugu, *peddakai* (the large fruit) and Urdu *phul.*

The fruit is cylindrical and quite smooth. When ripe it bursts out spontaneously. Its colour then is yellow often mottled with dark green. It varies in size from 30-60 cm. long and 7.5-15 cm. in diameter and weighs about 4-8 pounds. The seeds are smaller than those of melon.

This is cultivated in many parts of India.

The flowers cause i.e. aggravate all three *doshas* and also indigestion. The unripe fruit is sweet, dry and indigestible. It is astringent and healing to the bowels and cures *kapha* and *pitta* but causes *vata*. The ripe fruit is hot in quality and causes liver upsetting.

Yunani physicians consider the seeds as cooling, indigestible and a tonic to the heart and the brain as well. But it is likely to cause cough, they warn.

Seeds are used as a cooling medicine.

(b) *Cucumis melo* var. *utilissmus* DF

The names in Sanskrit are: *bahukanda, sthula, brihatphala* (big sized fruit); *chharda panika; chirbhati; ervaru, irvaru, urvaru; hastidantaphala, hastiparni* (leaves are like the elephant's ears); *lomasha kanda, lomasha* (bristly hairy); *mutrala, mutra phala* (a diuertic fruit); *pinasa; shantanu; toyaphala* (a watery fruit), *trapusha, valungi* and *vyala patra*.

This is called *kakur* in Bengali; *kankadi* in Gujarati; *kekkarikayi* in Kannada; *kakri* in Hindi;

kakkarikkayi, vellarikkayi in Tamil; and *katri* in Urdu.

The shape of the fruit is variable from shortly oval to cylindrical or even elongate, often reaching to a length of nearly one meter. Even its colour is quite variable from dark green to white almost, usually changing to a bright orange colour when ripe. The seeds are smaller than those of the melon.

This is well cultivated in many parts of India.

Ayurveda considers the unripe fruit as sweet, tasty, dry and cooling. It is astringent, diuretic and cures liver complaints and urinary stones. It is indigestible and causes *vata, kapha* and flatulence (a distension of stomach and bowels by gas). The ripe fruit is hot, a tonic as well as a stomachic. It cures thirst and fatigue but causes liver complaints and a derangement of blood. The root of the sweet variety finds an application as a sedative (causing a calming down) drug in relieving the uterine pains during pregnancy.

Yunani physicians presume the fruit as fattening. They use it in thirst, fever and liver troubles. Three varieties are recognised by them: sour, bitter and sweet. The seeds are diuretic, pungative and they counteract the heat of fever. They enrich blood, quench down the thirst and improve complexion of the skin. The oil from the seeds is sweet and is used in fever. It is also regarded as good for brain as well as body. The

root of the sweet variety induces vomiting.

The seeds are described as cooling, highly edible, nutritive and diuretic. They are actively employed in such urinary disorders as painful urination, or, outright suppression of urine. Seeds are crushed into a pulp with water and are given alone or in combination with salt and rice *conjee*. The powder of the roasted seeds is a powerful diuretic and therefore beneficially used in expelling stones and gravels in the urine.

Cucumis melo is also called Musk Melon in English because of its pleasant aroma. This is extensively cultivated in gardens and more particularly the sandy river beds particularly in the North West and Northern Bengal.

The fruit is eaten raw and also cooked. Its pulp yields a good, nutritive, demulcent (i.e. soothing), diuretic, cooling and refreshing drink. It is also beneficial as a lotion in chronic and acute eczema as well as tanning and freckles of the skin. Taken internally it rectifies dyspepsia or mild indigestion. The pulp when mixed with cumin seeds and sugar candy is a very welcome and cool diet during the hot seasons.

Seeds yield a sweet edible oil which is nutritive and also diuretic and found to be beneficial in most painful discharges and retentions of urine. Actually however such a beneficial action is attributed to the seeds and their kernels for the seeds of all the species of the genus *Cucumis*. The

seeds are pounded and mixed with sugar candy to yield a pleasant and nutritive diet.

Root has an emetic as well as a purgative action.

The whole fruit is useful in chronic eczema.

The plant resembles very much the water melon or *Citrullus vulgaris* in its general features, the composition and uses.

Yunani physicians consider its pulp as a nutritive and fattening article of food. It is particularly recommended to the emaciated and the weak. The best time to eat this fruit is in between the two meals in the afternoon. Eating the fruits often cleanses the teeth and the latter will acquire a dazzling shining thereby and the tartar of the teeth will also get cleaned. Eating them in proportion will render the bowels clear but too much of its consumption may lead to intestinal upsets. Because of its very commendable diuretic effect, its use is recommended in all urinary disorders, ascites (*jalodara*) and jaundice. It causes increased milk production in women. Even the rind of the fruit is diuretic.

The principal use of the seeds is in disorders of the liver and in promoting urine flow. It is given as a drink after removing the hard and fibrous portions in urinary obstruction and urinary calculus or *ashmari* and also in gonorrhoea. It is beneficial in morbid swellings of the liver, the kidney and the bladder. Because it is a scarifying

drug it improves the complexion of the face and cures many types of skin diseases. For this purpose it is applied as a thin paste.

Ayurveda considers the unripe fruit as somewhat bitter and sour in digestion; the ripe fruit however is very satisfying, nourishing, invigorating and diuretic. It removes thirst and fatigue and is beneficial in bilious disorders as well as in insanity. It causes or promotes *kapha* aggravation and is a reputed virile drug.

(iii) **Cucumis prophetarum** Linn. Bitter Apple. *Khari indrayan.*

Names

The names in Sanskrit are, *aindri, kakadani* (eaten by the crows) and *kshudra kanta phala* (fruit with small spines). It is known as *kantalanin indranan* in Gujarati; and *khari indrayan* in Hindi.

Botanical Description

This is a poor climber and mostly a spreader on the ground. Stem is slender, angular and grooved and rough to touch. Tendrils are very short, striate and sometimes totally absent. The shape of the leaf is very much variable. Leaves are rigid, somewhat ash coloured, rough and coarsely hairy on the nerves beneath. Base of the leaf is heart shaped but sometimes truncate i.e. straight as if cut away. Leaf is frequently 3 lobed, the lobes usually show minor lobes in turn and the terminal lobe is often

contracted at the base. Both the male and the female flowers occur in the same plant. The fruit is somewhat globose 2.5 - 3.8 cm. long and nearly as broad. It is longitudinally striped with green and white patches. Its surface is spiny. The seeds are ellipsoid.

This is a plant mainly of the drier parts of India, Marwar, Rajasthan in general, Deccan and Bellaey of Andhra Pradesh. It is also found in Sindh and Baluchistan and Pakistan as well as Iran, Egypt and Abyssinia.

Medicinal Properties

The whole plant is emetic and also a purgative.

In Baluchistan, the dry roots are well pounded and eaten with curds or butter. This acts as a purgative. South Africans employ the pulp of the fruit as a purgative.

(iv) **Cucumis sativus** Linn. The Cucumber *khira.*

This is a very favourite vegetable, eaten raw, cooked or pickled. This is common and popular all over India and has innumerable local varieties, the chief features of variation being in the size, the shape, the colouration and the keeping quality of the fruits. Just as it happens in another famous and equally widely distributed crop of India, namely mango, every region would like to consider its own variety as the best and the choicest cucumber.

Names

Sanskrit gives a number of names: *bahuphala* (yielding many flowers), *kandalu*, *kantaki lata* (a spiny creeper) *kantakiphala* (bearing a spiny fruit), *katalu*, *koshaphala* (a case like fruit), *pitapushpa* (having yellow flowers), *sudhavasa* (an abode of nectar; does this refer to abundant milky pulp especially in the fully ripened fruit?); *sushitala* (very cool; compare idiomatic expression in English "cool as a cucumber"), *trapu*, *karkati* and *trapusha*. *Trapusha* appears to be the specific name for cucumber in Sanskrit; the other terms in this list are descriptive of some aspects of the plant, while this appears to be the distinctive name, not likely to be applied to any other plant, whereas all the others are actually employed for many other plants besides cucumber.

It is called *khira*, *sasa* in Bengali, *kakari*, *kankadi*, *tansali* in Gujarati; *khira* in Hindi; *sautekayi* in Kannada; *kakdi*, *khira*, *tavase* in Marathi; *khira*, *khiyas* in Punjabi; *vellarikayi* in Tamil; *dosa kaya* in Telugu.

Botanical Description

This is a rather poor climber but a successful creeper on the ground spreading out all around the central point quite densely. Its surface is roughly hairy throughout and the stem is often hollow and weak. Leaves are membranous with a base which is deeply heart shaped or angled and shallowly 3-5 lobed. They are about 11.5 centimetres in

diameter, some of them in the same plant are larger upto 15 by 14 centimetres. Both sides of the leaf have softish hairs below but the upper hairs have thickened bases and the ribs are rough beneath or with very stiff hairs. Margin of the leaf is denticulate (i.e. with minute teeth). Of the three lobes of the leaf blade, the middle or the terminal one is lanceolate (elongated and lance like) while the basal two are hastate (not so long and spear shaped). Sometimes lobing is almost not present. Flowers are yellow, male flowers occurring in clusters, while the female flowers are solitary.

The fruit is thickly covered with very bullous based hairs or soft spines to start with. They are usually deciduous, falling down as the fruits mature. The final fruit is muricate (minutely shiny) or roughly warty or may show sharp but soft spines, still persistent as in some varieties called the spiny cucumber.

Cucumber is believed to be the native of North India. But it is now cultivated in all parts of India and also in warm and temperate countries throughout the world. Cucumber is known to have been under cultivation since 4,000 years, presumably spreading out from India. Many references for the plant occur in Hebrew, Egyptian, Greek and Roman writings of the ancient times.

Medicinal Properties

This is the same as those of *C. melo* var. *utilissimus*.

The cut pieces of fruit or rather thin sections of it are applied to relieve inflammations.

The seeds possess cooling properties. They are also used as diuretic agents to provoke urination.

The leaves are boiled and mixed with cumin seeds and then roasted and powdered. These powders are administered in throat afflictions.

In Madgascar, the Betselio tribes use the fruit to kill worms.

Ayurveda recognises two varieties in cucumber, the sweet and the bitter, resembling each other in all respects excepting the taste of the fruit.

The sweet variety is cold in quality and sweet in post assimilative effect. It acts against the aggravations of *kapha* and *pitta*. It removes tastelessness in food at the mouth.

Actually however the lexicons of Ayurveda (or the *nighantus*) speaks of fourteen varieties of cucumber and they are also named variously by such terms as *valuka* (of the sandy areas), *shad bhuja* (probably referring to the six striations on the fruit), *china karkatika* (Chinese Cucumber), *gopala karkatica* (cowhurd's cucumber), *mamsala phala* (with meat like or fleshy pulp) and so on. Their diverse descriptions also exist. It will not be difficult to equate them to the numerous varieties of the different regions of our Country if one makes a study of the situation closely.

A few classical references for the sweet variety are as follows:

Charaka: Administering a drink of the powder of the seeds in grape juice is excellently beneficial in all types of urinary disorders such as difficult urination (*mutra kricchra*), urinary stones and the like.

Sushruta: In the disease of *udavarta* due to obstructed urination a drink of the seed powder along with *saindhava* salt in *conjee* is advisable.

A *tola* of the seed powder is to be drunk with *conjee* adding a little of *saindhava* salt; this is for getting relief in obstructed urination.

Vaidya manorama: A drink of milk prepared with the root of *kakadi* is effective in destroying the shooting pains of a pregnant woman.

The seeds of the bitter variety are diuretic and also emetic (i.e. they cause a vomiting), simultaneously.

Yunani physicians consider *khira* (a variety of cucumber, quite common in the north, very tender and rather longer than the usual cucumber, very refreshing but very poor in keeping quality; it is best eaten, immediately and on a fresh raw state) as warding of the aggravations of blood and bite. It quenches the thirst very well and brings about a profuse urination without any fail. It is beneficial in fever due to *pitta* and blood as well as in burnings at the time of urination and in jaundice.

In headaches due to an excess amount of heat, keeping thin flakes of *khira* on the head or even smelling fresh fruits will prove particularly effective. It is much reputed as being curative in insomnia or sleeplessness.

Its excessive use is however contra-indicated to persons of cold constitution; they are then likely to suffer from constipation.

Both the seeds and the leaves of the common cucumber are used medicinally. Seeds contain much starchy material along with a large percentage of mild oil. Cucumbers are best used as raw. A variety in the Coastal Karnataka *bannada sautekayi* (the coloured cucumber) however is an exception. Here, the rind is rather thick and reddish and this vegetable is best eaten only after cooking. Its keeping quality is also remarkable among the cucumbers. Well matured fruits of this variety can be kept stored for months together almost like the ash gourd and the pumpkins; infact, they are actually preserved that way for being used particularly during rainy seasons when there is a scarcity of other vegetables.

The raw cucumber forms a good salad material and most deliciously eaten raw. The taste increases if flavoured with lime juice, pepper and salt as a dessert. One can secure maximum amount of the vegetable juices and their vitamins and the mineral salt by eating cucumbers raw. This is also cooked and eaten like the pumpkins. There is a large

variety of cucumber which is called *tavas*. When ripe in Maharashtra, this is much used in pickles, curries and also eaten raw.

There are five species of this Cucurbitaceas family, all of whose seeds are used together and are similar to one another in action. They are: *Cucumis sativcas, C. melo, C. utilissimus, Citrullus vulgares* and *Benincasa cerifera*, the ash gourd. The seeds of all these plants are dried and ground into a meal and used as an article of diet.

Leaves of cucumber are boiled, mixed with cumin seeds, roasted and powdered. These are administered in doses of 30 grains or more in the affections of throat. Powdered and mixed with sugar they act as powerful diuretic agents.

There is an American species *Cucumis tilifolia* called the Malabar gourd, which is mainly an ornamental plant.

Yunani physicians speak of one more cucumber, *Cucumis dudain* Linn called *kachari, pethtul* or *sengti* in Hindi, *dastambuya* in Persian and Cucumber Madras in English. This is found all over India but particularly in Punjab, Uttar Pradesh and Jaipur.

It is a wild inferior cucumber, a creeper of the fields. Flowers are yellow. Fruits are small, 4-5 inches long and ovoid. Immature fruits are green or whitish green and very bitter. They become yellow on ripening, sometimes with green longitudinal streaks; they are sour and sweet and

slightly acidic in taste. They are very many varieties of this species, varying in fruits, long or globular, sweet or bitter, big or small and so on. The fruits are cut into small pieces, dried, preserved and used as a culinary vegetable. The ripe fruit is very charmingly fragrant; infact it is kept in hand mainly to smell-the persian name *dastambuya* is because of this use. Jaipur *kachri* is much sour and less sweet.

The fragrance is very invigorating. The mature fruit is diuretic; taking it for a few days is believed to cause a total shattening down of urinary stones! It is a good appetiser, a commendably digestible fruit and an effective agent in overcoming the aggravation of all the three *doshas*. Fruit is slit open, dried and then roasted in ghee after sprinkling a pinch of salt. It is then very tasty. It is cooked with meat, when the cooking of the meat gets hastened and the fragrance is also added to the dish. Along with hot water its powder is a sure remedy for stomach pain due to gasses. It has beneficial action in paralysis.

There are some special small cucumber varieties in America, *Cucumis angceria* whose tiny fruits are soaked in brine tanks, treated with boiling vinegar and sometimes spiced to prepare pickles on a large scale.

Cucumber contains a strongly proteolytic enzyme which is ereptic in nature i.e. of an enzyme of the small inter fine acting on casein, gelatinel.

6. Chitraphala (picturesque fruit, referring to the variegated patterns of colouration on the fruit). *Indrayan* and *Tarbuz* in Hindi, *Colocynth* and *Water melon*

Botanically *chitraphala* comes under the genus *Citrullus*. The Sanskrit name is particularly apt because the globelar fruit has a very picturesque surface marked by irregular and striking patterns of variegated colouration on a basic greenish background. The genus comprises of two species in India, both of which are very well known and favourites in their respective fields. They are *C. colocynthis* and *C. vulgaris*. Of these, the former is a very ancient medicinal plant much referred even in the Vedas and highly extolled all over the world as well. It is a recognised, official drug in many countries besides India. The latter is a very delicious, refreshing and highly prized and extremely widely cultivated plant all over India specially in the dry river beds. The former is almost always collected from the wild, there are almost no varieties in it. The latter is richly cultivated and offers a great many varieties differing amongst themselves in the details of the fruit shape and size.

The fruit of *C. colocynthis* or the Colocynth Fructus as it is called in pharmaceutical industry is an official drug in Austria, Denmark, France, United Kingdom, Holland, Hungary, Norway, Sweden, Japan and the United States of America. Even *C. vulgaris* is such an official drug in Russia, China, Indo China and Guiana, but not in India. In

South Africa there is another species *C. caffer* Schrad which is an official drug.

The chief points of difference between the two species are shown in a key below:

1. Leaves are deeply divided. The whole plant is rough. The fruit is always completely spherical and compared with the other species it is quite small. It is wholly bitter and unedible. *C. colocynthus.*

2. Leaves are deeply divided, or only moderately lobed. The whole plant is smooth and non-hairy; only occasionally it may be somewhat hairy. The surface is never rough. The fruit shows much variation specially under cultivation; it is quite often perfectly spherical but may also be rather elongated and always large sized. The fruit is never bitter and always sweet and deliciously edible; occasionally however individual *C. vulgaris* fruits of a plant may turn out to be bitter and non-edible.

(i) **Citrullus colocynthis** Schrad. Bitter Apple, Colocynth.

Names

Sanskrit offers a large number of names to this much utilised medicinal plant: *atmaraksha* (protective of one's self); *brihat phala, mahaphala* (with a big sized fruit); *chitrala, chitraphala* (fruits, picturesque), *chitra valli* (a picturesque creeper); *dirghavalli* (a long creeper); *devi; gaja chirbhita* (the elephant sized *chirbhita* which is *Cucumis melo* var *momordica.*); *hastidanti; kapilakshi* (having tawny

or reddish eye, referring to the colouration), *katurasa* (bitterly juicy); *kumbhasi*; *mrigadani* (the deer cucumber), *ramya* (charming). *trapusi*, *vishala* (widely spreading).

It is called *indrayan*, *makhal* in Bengali, *indrak*, *indravaranan*, *indravan* in Punjabi; *jerabi ghorumbo*, *indrayan*, *makal* in Hindi; *pavamekke kayi*, *tumatti kayi* in Kannada; *pey kommutti* in Malayalam; *indrayan*, *indra phal* in Marathi; *peykkumutti* in Tamil; *chittipapara*, *etipuccha* in Telugu and *indrayan* in Urdu.

Botanical Description

This is an extensively spreading creeper of wild fields. Root is perennial. Stem is diffuse, slender, angled, branched, rough and often hairy. Tendrils are simple, unbranched or branched into two, slender and hairy. Leaves are very variable 3.8-6.3 by 2.5-5 cm in the wilder form (larger under cultivation), usually delta like (i.e. rather triangular) in outline, pale green above and ashy below, rough on both sides, with 5-7 lobes or very commonly 3-lobed, the middle lobe being the largest. Each lobe is in turn divided deeply and these lobes are having a wavy margin. All the segments have an obtuse apex. Leaf stalk is densely and roughly hairy. Both male and female flowers occur in the same plant. Petals are pale yellow in colour.

Fruit is perfectly globular, though slightly depressed at the ends, 5-7.5 cm. in diameter. It

shows a picturesque pattern of variegated green and white surface. It is smooth and non-hairy when ripe and filled with a dry spongy and very bitter pulp. The outer layer of the fruit (the epicarp) is thin. Seeds are 4-6 mm. long and pale brown.

This plant occurs throughout India and Sri Lanka, both wild and cultivated. It is also regarded as indigenous to Arabia, West Asia, Tropical Africa and the Mediterannean regions. It is particularly prevalent in coastal plains. Though very useful, the plant is never cultivated anywhere in India. It is always collected from wild.

Medicinal Properties

The fruit is bitter and pungent in taste. It is cooling, purgative and anthelmintic. It counteracts the heat of fever and is carminative, expelling gases from the bowels. It cures a host of diseases: tumours and ascites and also leucoderma, elephantiasis, asthma, bronchitis, jaundice, splenic enlargements, anaemia, dyspepsia (indigestion), constipation, throat diseases and ulcers. It is useful in rectifying abnormal presentation of foetus and also in atrophy (or non-development and growth) of foetus.

Besides the above, which are all the properties of the fruit, the root has a beneficial effect in the inflammation or breasts and pain in the joints. Externally it is used in the diseases of the eye and in the pains of the uterus.

Yunani physicians consider that the properties are the same as those of *Trichosanthes palmata*.

In Konkan, the fruit and the root are rubbed (with or without another bitter medicinal plant called *nux vomica*) into a paste with water and applied to boils and pimples. In rheumatism, equal parts of the root and long peppers are given in the form of a pill. A paste of the root is applied in the enlarged abdomen of children.

The fruits and seeds are used as purgatives in some parts of Baluchistan. In Guinea, a thin ointment prepared from the leaves is applied in migraine (pain in the eye accompanied with head ache) and neuralgia (nervous pain). The parts used are: roots and fruits.

This is regarded as pungent and bitter in taste, hot in quality and bitter in post-assimilative effect. It is destructive of the aggravations of *kapha* and *pitta*.

Three varieties of *indrayan* are recognised in Ayurveda: (i) the bigger *indrayan* whose fruit on full maturity is of the size of a big *musambi* fruit. This grows on the banks of river or the sea. The fruits are fed to horses by which the worms in their stomach are destroyed. This is the *Colocynth* drug of commerce and the official pharmacopea (ii) The smaller *indrayan*; the fruits are small and also display small prickles on the surface. (iii) The red *indrayan*, this is called *kondal* in Marathi, since it forms an ear ornament (*kundal*) for the idols of Ganapati; the fruit is red and beautiful.

The bigger variety is most suited as a medicinal plant; it is this that was exported to European druggists from India whence Colocynth has gained a much extolled place in their materia medica which it occupies even now. What is sold in European market as the colocynth drug however is only the dried pulp where the rind is completely taken out. In India on the contrary the whole fruits are sold nowadays and not the pulp alone. Actually however, the supply of this drug comes from many places now. The Turkish Colocynth is considered the best. The Egyptian drug supply does not contain any seeds. Abundant supply of this drug exists in India, which is probably a home country of this plant. Still however, a well known authority (Chopra) had an occasion to remark that we still continue to get our supply from Europe, Arabia and Syria. We should remember that the plant occurs in great abundance here and in addition we also have many reputed substitutes for it.

The seeds contain 21 per cent of yellow colouring substance, an oil of pungent taste and a variety of acids such as oleic, linolic, miristic, palmitic and stearic acids. Their medicinal properties are worth being studied still further.

A few references from the classics to the drug plants of *indravaruni* or *indrayan* are as below:

Sushruta: The root of *indrayan* is to be administered with jaggery in jaundice.

Bhavamishra: The root of indrayan, *pippali* and jaggery are to be mixed in equal quantity. One *tola* of this is to be taken daily. This will just destroy gout.

Vrinda: When a very acute pain arises at the breasts because of too much milk not getting released due to several reasons, the sturdy basal root of the plant is taken, rubbed against a grind stone and the paste applied. There will be an appreciable relief for such and other inflammations of the breasts.

Chakra-datta: For all morbid enlargements (eg. in splene and liver as well as any where else), take a *tola* of the powder of the root, mix it in castor oil and the patient is to drink this for three days with milk. The enlargement gets resolved.

Even very severe goitre responds well for a drink of this root along with a cow's urine.

All psychotic insanities are presumed to be cured by taking a snuff of this fruit ground into a paste in cow's urine.

A very simple and believed to be quite an effective remedy is to apply the paste of its root on the affected region in order to extract the thorns inside.

Vaidya-manorama: If eyes are aching, soak a soft cloth in the juice of the fruit and keep it at frequent intervals again and again on the eye. This will relieve the pain.

For immediate delivery, the advice given is to grind the root in water, mix ghee and apply it below the navel. Delivery is said to be immediate!

Rajamarthanda: For skin warts, the root is to be ground in goat's urine and applied. The warts will fall down.

To cure gangrenous and worm laden wounds of animals, extract fresh juice from the fruit and apply. The worms will die and fall down.

Sharngadhara: To turn the hairs black, apply the seed oil of *indrayan*.

Yunani physicians employ this drug extensively as a drastic purgative and also in ascites, jaundice and several uterine afflictions-specially amenorrhoea or absence of menstrual flow. Even Greek and Roman medicines mention the extensive use of this drug. As a solid extract, this drug plant forms an ingredient of many purgative pills in modern medicine.

The drug is official in British Pharmacopea-the recognised lists of medicines in UK.

It is recommended there for fever, intestinal parasites, constipation, and congestions in liver, abdomen, visera and cerebral region. Juice of the fruit mixed with sugar is a household remedy in dropsy, even in Great Britain.

A paste of the root is applied to the enlarged abdomen of children. Fruit or root with or without

nux vomica is ground into a paste with water and applied beneficially in boils and pimples. The powder of the root is a good insecticide.

A caution is: never to use the extract without some aromatic drugs so as to prevent its griping tendency. Its use is contra—indicated in pregnancy and any irritable conditions of the intestinal tract for e.g. peptic ulcers.

The dried spongy pulp of the fruit of this plant constitutes the colocynth drug of the modern pharmacist or the science of preparing and marketing medicines. Quite likely its original home is India. But the plant is now widely distributed and actively cultivated in the Mediterranean region. Its fruit pulp is the source of the glucosidal drug colocynth - a powerful purgative.

(ii) **Citrullus vulgaris Schrad** Water melon.

Names

The names in Sanskrit are: *chitraphala, chitravallika* (picturesque fruit, creeper), *kalinda, kalindaka* (darkish-green), *krishna bija* (with black seeds), *lata panasa* (a creeper jack fruit), *madhura phala* (sweet fruit); *mamsala, mamsaphala* (a fleshy, meaty fruit), *mutrala* (diuretic) *natamra* (a bent i.e. spreading mango); *rajastinisha; suvastula, vritta* (well rounded fruit) and *tarambuja* (floating on water, as the fruit does when placed in water).

It is quite likely that its most common name *turbuz* comes from this Sanskrit term *tarambuja*.

It is called *tarbuza, tarmuj* in Bengali; *karinga tarbuch* in Gujarati; *halinda, hind wana, karbuz, tarbuz* in Hindi; *hindwana,* (the fruit from India), *mathira turbuz* in Punjabi, *pitcha, pullum,* in Tamil; *turbuj* in Urdu.

Botanical Description

This is an extensively spreading or climbing annual plant. Stems are thick and angular. Young shoots are softly hairy and woolly at the tips. Tendrils are bifid, stout and softly hairy. Leaves are 7.5-20 cm long, deeply divided or only slightly lobed, smooth and non-hairy. Leaf stalks are softly hairy. Petals are yellow within, greenish outside and again softly hairy.

Fruit is upto 25 cm in diameter, nearly globe like or ellipsoid, smooth, darkish green usually but may be sometimes yellowish with green patches; the surface is often covered with a shiny waxy coating. It is massively fleshy, juicy, red or yellowish white. Seeds are black.

This is largely cultivated throughout India and in all warm countries. This is believed to be a native of Tropical and South Africa.

Medicinal Properties

The unripe fruit is sweet, cooling, fattening and strengthening. It is astringent (constrictive of the tissues and hence healing) to the bowels and cures jaundice. The ripe fruit is sweet, and rectifies the

aggravation of *kapha* and *vata* but causes biliousness. The seed is sweet, fattening and believed to be aphrodisiac viz. increasing the urge of sex.

Yunani physicians note that the fruit is tasteless when unripe but sweet when ripe. It is cooling, diuretic, good for the stomach, purifies the blood, quenches thirst and cures biliousness. It is beneficial for sore eyes, scabies and itching. The seeds are tonic to the brain.

The juice of the pulp is given in Guiana as a cooling enema. An emulsion of the seed is made into a poultice with the pounded leaves and applied hot in cases of intestinal inflammations.

There are many varieties in *Citrullus vulgaris*. Some of them are of recent introduction by improved agricultural measures. Two such varieties of Punjab have proved very excellent in taste. In general the water melons grown in the river beds are of more commendable quality and taste than the ones grown under farm cultivation. In the jungles around Bikaner, this melon alone forms the main food for the people for a few months together.

The flour of the seeds is also edible. Even the seed oil is used as an edible oil. Its taste as well as aroma are both good: it also contains a protied and the citurllin. Besides being edible, it is also used to burn as a fuel.

Pandhra tarbuz, the white, *kala tarbuz*, the dark, *kalami*, the *grafted*(?) and *surai* are the names of the varieties of this plant in Sangamner and Dhulia districts of Maharashtra.

In Pondicherry area a new variety of water melon is introduced recently. Here the non-edible outer rind is quite thin as compared to the usual varieties and the red flesh inside is very sweet and fills up almost the entire cavity within. In general the flesh of the water melons is pink to red, very soft, watery and sweet. This pulp is refreshing, cooling and diuretic.

The dried seeds with their hard coat removed, taste like almond- a fact which is not much appreciated by many.

The water melon is sometimes believed to be a native of Tropical Africa where it has been in used since very old times by the wild tribes. It has been under cultivation also since centuries. It occurs in ancient Egyptian paintings. This is an annual plant with extensive spreading on the ground which may cover a whole field. Some of the large fruits may weigh upto 50 pounds or more. Its varieties differ mainly in the shape of the fruit, its colour, thickness of the rind and the degree of sweetness. The plant requires a fertile sandy soil with abundant sun for its rich growth. The fruits are plucked when fully ripe and stand transport or even shipment well.

There is an American variety called *Citron* whose fruits have a white, more solid flesh and constitutes the preserving melon. It is used in preparing jams, jellies and preserves. Because of its high protein content, it is added to fruit juices that do not get protein supply otherwise readily.

(iii) ***Citrulus vulgaris var. fishelobs.***

This is called *tandus, tendu,* and *tinda* in Punjabi and *dilpasand* (very delightful to the heart) in Sindh.

It is cultivated in the Western districts of the upper Gangetic plains, Punjab and Sind.

Stems and leaf stalks are hollow, Tendrils have 3-4 rarely 5 branches. Leaves are much less divided than in water melon. Fruit is about the size of a small turnip depressed at both the ends, hairy when young, smooth and hairless on ripening.

7. Bimbi, *tundika, kanduri.* The Coccinia.

The plant comes under the genus *Coccinia* botanically. This comprises of only one species in India, *C. indica* which however has tow distinct varieties, the sweet and the bitter. The two resemble each other in all respects and are infact almost not distinguishable at all mutually excepting for the taste of the fruit which is sweet and highly edible (which makes it a choice vegetable) in the former, and bitter and completely inedible in the latter.

Names

This is a well known fruit in Sanskrit literature as well, because of the bright red fruits to which the lips of a beautiful woman are usually compared. There are many names: *bimba, limbaka, limbi, chhardini* (vomit inducing—this must be referring to the bitter variety), *dantacchadopama, ostopama-phala* (like the lips covering the teeth), *jhundikeshi, kambuja, karmakari, katutumbi, katuka, katutundika* (the bitter), *ruchira phala* (a delicious fruit); *tundi, tundikeri, tundika.*

It is known as *bimbum, telakucha* in Bengali; *galedu, galluda, gilodi* in Gujarati; *bhimb, kanduri, kunderi* in Hindi; *tonde* in Kannada; *kova, kwel* in Malayalam; *ghol, kanduru, kunduru* in Punjabi; *kovai, kovakkay* in Tamil; *bimbika, kaidonda* in Telugu and *kundaru* in Urdu.

This is quite common throughout India, Sri Lanka, Malaysia and Tropical Africa. The sweet variety is well cultivated and also shows some regional variations in size, shape and colouration, which is sometimes striped in the unripe state, though it shows a uniform, often shining green colouration on maturity.

Botanical Description

This is a perennial creeper, climbing up or spreading more on the ground. Stem is much branched, grooved, slender, smooth and non-hairy. Root is very thick. Tendrils are slender, striate, simple and unbranched. Leaves are 5-10 cm. long

and broad, bright green above and pale green below, studded and sometimes rough with papillae. They are palmately 5 nerved from a heart shaped base; quite often there occur circular glands between the nerves. Leaf blade is obtusely 5 angled or sometimes deeply 5 lobed, the lobes have a rather wavy margin with some teeth. Petals are white.

Fruit is ellipsoid or shortly cylindrical, slightly beaked at the tip, 2.5-5 by 1.3-2.5 cm, marked with white streaks when immature but bright scarlet when ripe fully. Seeds are rather obovoid, round at the apex, much compressed and yellowish grey.

Medicinal Properties

Sweet variety: The root is cooling and aphrodisiac (stimulative of the urge of sex). It stops vomiting, urinary losses and burning of hands and feet. It is given as a useful drug in uterine discharges. The leaves are sweet, acrid, cooling, and astringent to the bowels. It cures *kapha* and *pitta* but causes flatulence or a collection of gases. The flowers are used advantageously in itching, biliousness and jaundice. The fruit has a characteristic flavour. It is not easily digested, causes biliousness but is cooling and astringent to the bowels. It augments milk production in women. It counter-acts fever and cures leprosy, *vata* aggravations, burning sensations of the body, bronchitis, asthma, consumption, jaundice as well

as diseases of the blood and inflammation due to *pitta* aggravation.

Bitter variety: The fruit is bitter and pungent. It is a laxative, as well as an emetic. It removes biliousness, foul breath and bad taste of the mouth. It is regarded as curative of *kapha*, bronchitis, leprosy, anaemia, inflammation and diseases of the blood. It increases *vata*.

Yunani physicians consider the fruit as aphrodisiac. They also consider that it allays the thirst and is useful in biliousness and diseases of the blood.

Ayurvedic physicians utilise the freshly expressed juice of the thick tap root of this plant as an adjunct to the metallic preparations they prescribe for diabetes. In Konkan the root is pounded with the juice of the leaves to form a thin ointment applied to the whole body to induce perspiration in fever. The green fruit is chewed to cure the sores of the tongue. The bark of the root is dried and powdered to form a good strong purgative, in doses of 30 grains. The leaves are applied externally in eruptions of the skin while the plant itself is used internally in gonorrhoea. The leaves mixed with ghee forms a curative liniment for sores. Among the Mundas of Chota Nagpur the sap of the plant is mixed with mustard oil and water and is used as an ear drop to cure ear ache. A few drops of it is poured, after which the ear is plugged with cotton. The cooked leaves are said to be a very good diet for diabetes. The

plant has a great reputation in Bengal for having a remarkable effect of reducing the amont of sugar in the urine of diabetic patients. The fresh juice is pressed from the roots and leaves. This is then given either by itself or in combination with certain metallic preparations in the treatment of diabetes.

The leaves are boiled in gingelly oil and applied externally in many minor skin afflictions such as ring worm, psoriasis and itching. This oil is also used as an application to ulcers and as an injection to chronic sinusies.

8. Kushmanda. Gourds and Pumpkins.

Botanically this comes under the genus *Cucurbita* which consists of 2 species in India: *C. maxima* and *C. pepo.* The technical difference between the two is given in the key below:

1. Leaves have five shallow lobes or the leaf blade may not be cut at all and is therefore almost entire; if this is lobed, the sinus i.e. the gap between the lobes is narrow. *C. maxima.*

2. Leaves are distinctly five lobed, sinus between the lobes is broad. *C. Pepo.*

Both are large climbing herbs and hairy.

(i) **Cucurbita maxima** Duchesne. Red gourd, Squash Gourd.

Names

Sanskrit calls it *dangari, gramya* (a rustic vegetable), *qudayoga phala* (jaggery like fruit),

kushmanda, *pita kushmanda* (The yellow *kushmanda*), *pitaphala* (fruit, yellow), *pita pushpa* (flower, yellow).

It is called *sappuri komra* in Bengali; *koron* in Gujarati; *kaddu*, *mitha kaddu* in Hindi; *kumbala* in Kannada; *pushini* in Tamil and *gummadi* in Telugu.

Botanical Description

Leaves are nearly round or orb like in outline, not pointed or much lobed but with deep sinus at the base. Petals are usually soft, obtuse and occur more or less in the form of crinkly, revolute or hanging lobes; the corolla tube is bulging at base. Flower stalks are short, spongy, nearly cylindrical and not expanded at the point of attachment with the fruit.

This is cultivated throughout India and most warm regions of the world.

Medicinal Properties

The fruit has a characteristic flavour. It is diuretic and a tonic. It allays thirst and cures *kapha* but increases *vata* and causes biliousness as well as a loss of appetite.

The seeds are used to destroy tape worms. The oil from the seeds is prescribed as a nervine tonic. The pulp of the fruit is often used as a poultice. The seeds are an old and popular remedy for tape worm infection in Malta and is generally considered as very effective and safe. In Guinea,

the fruit is regarded as a sedative, emolient (soothing) and refrigerant (refreshing). The pulp is applied to burns and scalds and also in inflammations, abscesses and boils. It is also prescribed in migraine and neuralgia (nervous pain). The seeds are worm killers, especially the tape worm.

The fruit of pumpkin is cold in property, appetising, sweet and a highly satisfying culinary vegetable. It has a beneficial action in burning sensations and urinary obstructions. This is always cooked and eaten. The tender fruits are less sweet and less strengthening while the fully mature fruit is a destroyer of bodily fatigue as well as mental confusion; and is also heavy, quite sweet and promotive of *kapha*. It also pacifies burning sensations, upsettings of the blood and excessive thirst.

Pumpkins grow to enormous sizes under proper agricultural conditions. The fruits may occasionally grow to 7-8 feet in circumference and 200 to 300 pounds in weight. It is not only the fruits of the plant that are used as culinary material; even the leaves and flowers are used in preparing special dishes.

The seeds are also well nourishing and oily besides being vermicidal.

Seeds are particularly counter-active against round worms. The seed oil is to be administered in a dosage of one *tola* every time and at an interval of

two hours every time. A light purging oil (eg. castor oil) is also simultanously given. The seed kernel finds an application in blood vomiting and haemorrhage of the lungs. The seed oil is a nervine tonic also.

(ii) **Cucurbita pepo** Linn. Pumpkin, Ashgourd.

Names

Sanskrit calls it *karkaru, karkaruka,* kushmandi.

It is called *kumara, lanka, safed kaddu* in Bengali; *kumra, safed kaddu, petha* in Hindi; *budu kumbala* in Kannada; *kohala* in Marathi; *kalyana pushani* in Tamil; *budade gumadi* in Telugu; *luki* in Urdu.

Botanical Description

Stems and leaves have a harsh, prickly armature. Leaves are stiff, more or less rigid and erect. Leaves have a triangular, pointed outline and often have deep lobes. Petals are mostly erect and not drooping. Their tube is narrowed down towards the base.

Fruit stalk is strongly 5 angled and is expanding very little or not at all at the base.

The plant is considered to be a native of America. It is cultivated in many parts of India.

Medicinal Properties

The fruit is cooling and is astringent to bowels. It increases appetite and cures leprosy, *kapha, vata,*

thirst and fatigue. It is also known be a purifier of the blood.

Yunani physicians consider that the leaves are digestible, analgesic (a pain killer) and a remover of biliousness. The fruit is sweetish, very cooling, laxative and is good for teeth, throat and eye. It allays thirst. The rind is used in piles and applied to wounds. The seeds are sweet, diuretic and a tonic and fattening; and it cures sore chests, haemoptysis, bronchitis and fever. It quenches thirst and is good for kidney and the brain.

Leaves are applied externally to heal wounds and ulcers. The seeds are used for flavouring certain intoxicating preparations from hemp to make them more potent. The seeds are destructive to tape worms and are also diuretic and a demulcent. They have been a popular remedy for tape worms in Europe since very old names.

9. *Sechium edule: Chow chow* in Hindi and Marathi. Chayote in English.

Names

This is a known introduction to India of very recent times. Its name in some regional languages viz Kannada (*seme badane kayi*) or Tamil (*seme katri kayi*) both meaning "a foreign brinjal" clearly reflects this situation.

This is a trailing herb of tropical America. Its gourd like fruit is a much prized culinary vegetable. This is a perennial plant with large

tuberous roots. Both the roots and the fruits constitute principal foods of Aztecs, Mayas and other native Indians of Central America. But the plant is nowadays very common in many places including India where also it is a much popular vegetable. The trailer grows very vigorously and the yield of the fruits is also quite prolific. The plant is put to many uses. The tubers and the fruits are valuable food materials. Leaves also can be used as greens and the young shoots serve as a substitute for greens or forage. The straw is a valuable material for making hats and baskets. It can be very well grown as a bee plant so as to attract honey bees and aid in honey production or as an ornamental bower.

The nine genera and their several species discussed so far yield fruit vegetables and are also of medicinal value. The following plants are however wholly medicinal; they do not have any value as food, but are of considerable medicinal importance. Of them, the most important is *shiva lingi*.

(i). **Shivalingi :** *Bryonopsis laciniosa* Naud.

Names

Sanskrit gives a number of names for this quite a common wild climber. They are: *apastambhi, bahupatra* (with many leaves), *baka pushpa* (flower is like a crane), *chandra, chitra phala* (picturesque fruit), *devi, ishwari, lingaja, linga sambhuta, lingini, pandoli, shiva valli, tulthini*.

It is called *mala* (a garland), *shivalingi* in Bengali; *shivalingi, gargumaru* in Hindi; *linga donda* in Telugu.

Botanical Description

This is quite a common wild creeper. Stems are much branched, slender, grooved, smooth and non-hairy. Tendrils are also slender, smooth, hairless and branched into two.. Leaves are thin and membranous, 10–15 cm long and equally broad, green and rough above, pale and smooth, below. Leaf base is heart shaped; the blade is 5 lobed, the lobes are oblong and lance like, the middle one sometimes about 10 cm long, margin is wavy and teethed distantly. Male flowers occur in small clusters of 1–6 flowers. Female flowers are mostly solitary.

Fruit is nearly stalkless, 1.3–2.5 cm in diameter, globose, smooth, bluish green or red with broad vertical lines. The seeds lie within, like the *linga* of Shiva; with a spout of Ganga. Regional names mostly reflect this feature.

The whole plant has a bad smell.

This is found throughout India and also occurs in Mauritius, tropical Africa, Malaysia, Philippines and Australia.

Medicinal Properties

Ayurveda considers it as bitter, hot and a very commendable *rasayani* or an elixir. This is regarded as a drug that would tie down mercury

and a divine drug that is all accomplishing (*sarva siddhi*). The plant however does not occur in the ancient classics.

The fruits are boiled and cooked, slightly fried in oil and made into a curry. Eating them 10–15 times would produce a loose motion by which the bowels are cleaned. This would also prove beneficial in the enlargement of spleen and liver.

The juice of the leaf is applied over oedema with useful results. The whole creeper along with its fruits is dried and employed along with other drugs to prepare a decoction that can be kept useful for a long time.

The Khakha tribal women of Porebundur believe that if these fruits are eaten enclosed within plantain fruits, the foetus gets retained and there will be no abortion.

Its main reputation is in that it prevents abortion and confers a male child.

Its bitterness is due to an alkaloid called bryonin.

(ii). **Melothria**

There are three Indian species in this genus none of which have any Sanskrit name; they also do not occur in the ancient classics. But they do have names in some regional languages and are used in folk lore and household medicines. They are all quite common plants.

(a) *M. maderaspatana.* Linn.

Names

It is called *agumalci, bilari* in Hindi and Kumaon; *mukkal piram* in Malyalam; *musimusikkayi* in Tamil *kuttarubedame* in Telugu; *bellari, chirati* in Sindh.

Botanical Description

It is an annual much branched very rough and heavy creeper; young parts are densely covered with white hair. Tendrils are simple, unbranched and sparingly hairy. Leaves are variable in size. Fruit is small, of the size of pea, smooth, green but variegated with yellow; on maturity it becomes wholly red.

Medicinal Importance

Seeds in decoction induce sleep. Decoction of the root relieves flatulence or collection of gasses in the belly. Chewing of the root relieves tooth ache. The tender shoots and the bitter leaves are recommended in dizziness of the head and liver complaints.

The Mundas of Chota Nagpur employ the crushed seeds to secure a relief from body ache, specially the strained back and the sprained loins.

The drug is an ingredient of many compound preparations for varied chronic diseases where persistent cough is a predominant symptom.

(b) *M. perpurilla.* Cogn.

It is called *bankundi* in Chota Nagpur.

The fruit is smooth, globose, minutely pitted; red, when ripe.

The root is used with milk in fever and diarrhoea.

(c) *M. heterophylla* Cogn.

It is known as *kudari* in Bengali; *amannurt, tardi* in Hindi; *tiddanda* in Telugu and *birkunduru* in Mundari.

The fruit is oblong, ovoid, tapering towards the apex and bright red when ripe.

In Konkan the juice of the root along with cumin seeds (*jira*) and sugar is given in cold milk as a cure for spermatorrhoea, an urinary disorder when sperms are discharged along with urine. Leaf juice is applied for blisters caused by marking nut (or *bhallataka*) juice.

It is a restorative and fattening or *paushtik* drug. Its root is then roasted with onion, *jira*, sugar and ghee or given by itself with sugar and milk.

Modern Work

As seen above, the whole family of Cucurbitace yields a rich variety and a large number of very popular vegetables for the kitchen many of which also have several important medicinal uses.

Naturally therefore, a number of these plants have been the subject of intensive modern study. An idea of this aspect is hinted below:

The antidiabetic activity of coccinia has received some confirmation as the sugar content in blood did show a decrease in the rabbits and guinieapigs and also albino rats in which diabetes was experimentally induced. It also has an antiprotozoal activity on *Entamoeba histolytica* that causes the disease of amoelic depentery. *Coccinia* fruit has very little fat and carbohydrates; its food value is thus not much; it has no energy yielding or the calorific content. But it is rich in mineral contents and vitamins. In medicine it is recommended for treating skin diseases, bronchitis and diabetes.

Cucumis prophetarum or *khari indrayan* in Hindi has been tested for its diuretic activity. Ether extracts of its seeds have been given to anaesthetised dogs. This produced a very significant increase in the renal creatine and chloride clearances that always accompany much of urination. The extract is found to have its effect on the renal glomerulus, the structure within the kidney where urine formation takes place.

Extracts of the seeds of *Cucumbita maxima* (*kaddu* in Hindi) were taken in water, ether and alcohol. All the three types have shown clear anthelmintic property of killing helminthic worms *in vivo* i.e. in the patient's living body or in *vitro*

i.e. in the petri dishes of the laboratory outside the living body of the host. This also had a significant effect on other types of worms, e.g. the trematodes.

The fruit pulp of *Cucurbita pepo* previously called (*Lagenaria* vulgaris as above, the *lauki*) is found to be highly nutritive as it contains all important nutrients like proteins, carbohydrates and minerals. Rat growth studies indicated that the fruit has a definite, though slight, supplementary nutritive value when added to the poor South Indian diet. An optimum level to have this addition is 10 per cent. Besides this, the crude water extract of the ripe fruit is shown to inhibit the growth of the virulent disease causing bacterium of tuberculosis, *Mycobacterium tuberculosis* completely, even in 1/10,000 dilution during *in vitro* studies. Such a crude extract shows encouraging results even *in vivo* studies on mice, experimentally induced with tuberculosis.

The medicinal property of the cucurbits springs mainly from the bitter principle found in many of its plants. As seen above this is found very commonly in many members, there being separate species or genus for it as in Snake gourds or the same species has bitter varieties as in coccinias or the highly edible fruit is itself also bitter as in *Momordica charantia* or the bitter gourd.

Of all these bitters the most famous is the colocynth, as old as the Vedas in its use and known the world over as coming originally from

India. Though this is true and the plant also occurs abundantly in India, it does happen to be also true that the raw material of its fruits as well as its preparations were till recently imported from Europe, Arabia and Syria. These fruits are almost wholly used as a medicine, but it is seen that they as well as their seeds are occasionally used as food in parts of Africa. There is no difference in the chemical composition between Indian and the European varieties. Both have an alkaloid and the bitter principal colocynthin, a glycoside which is a mixture of the alkaloid and a crystatline alcohol, called citrullol. The seeds also contain an alkaloid, a polysaccharide or a glycoside and an enzyme. Besides these, they have 20 per cent of a pale brownish yellow oil, called phytosterolin or ipuranol.

Chemical analysis of *Coccinia indica* shows that it contains an enzyme with amylolytic (starch digestive) property, a harmone and traces of an alkaloid. None of these reduced sugar when introduced subcutanously (i.e. beneath the skin) to rabbits. Fresh juice extracted from the, leaves slem and root of the plant produces a reduction of sugar in the blood or urine of patients suffering from glycocemia or abundance of sugar in the blood in urine - which is the characteristic feature of diabetes.

The fruits of *Luffa acutangula* (*torai*) contains a bitter principle loffein and the seeds contain a fatty oil. The yield of the oil is very rich; it is 47 per cent.

Seeds also contain another substance, the saponin which is seen to be toxic to frogs, causing a dissolution of its blood or haemolysis. This also has an action like that of digitalin, a valuable drug in heart troubles, in concentrations of 1 in 100 in two hours.

The medicinal value of *Luffa* is due to the presence of saponin in it.

Musk or *kasturi* has an unusual and characteristic odour for which it has become a very valuable material. Though this is an animal product, it is interesting to note that this musk odour is found quite commonly among the plants for example in *Malva moschata* and the seeds of *Hibescus abelmoschus* called in Sanskrit *latakasturikam* and *mushk dana* or *kasturi dana* in Hindi and common all over India and particularly so in Bengal. These are actually used in perfumery industry. It is significant to note here that two members of the family Cucurbitaceae contain this odour in abundance. They are: *Benencasa cerifera* or the Ash gourd and *Lagenaria vulgaris* or the *lauki*.

Analysis of the fruits of cucumber yeilds an enzyme erepsin, considerable amount of vitamins B, and C, another proteolytic (protein digesting) enzyme plus ascorbic acid oxidase and succinic as well as mallic acid dehydrogenases. The odorous principle is extracted with alcohol.

The bitter snake gourd or *Trichoranthes indica* is rich in many substances. Its root contains an amorphous saponin, hentriacontaine, a phyto-sterol, a non-nitrogenous bitter principle - glycoside in nature and resembling colocynth as well as a small amount of an essential oil, a little fixed oil and traces of tannins. The fresh juice of its unripe fruit is used as a cooling and laxative adjunct to alterative medicines that bring about useful changes in vital function of the body.

The fruits of *Cucumis sativus* or Cucumber contain a proteolytic (protein digestive) enzyme resembling erepsin and a bitter principle of as yet unknown nature. Because of the latter, its juice is seen to banish wood lice and fish insects. Its cut slices are strewn in the places where the lice are found for this purpose.

The cooling slices of Cucumber have another, rather modern use which is increasingly becoming popular. This is to apply them for cosmetic purposes on the face to make the skin cool and firm.

Apart from the diverse medicinal uses of the members of the family, quite a large number of them are very favourite fruit vegetables consumed raw as well as cooked. An idea of their food value is shown in the particulars given below:

Approximate percentage of composition and calories (the amount of energy released) etc. of some members of the family.

Names	*Protein or flesh formers.*	*Fats and starch or heat givers. The Carbohydrate*	*Mineral matters or salts. (Ash Constitu-ents)*	*Water content*	*% of total nutrients*
1. Cucumbers	0.75/1.3	3.2	0.5	95.2	27.4
2. Melons	0.5	7.00			
3. Musk melons	2.7	7.20	0.6	89/92	
4. Pumpkins	1.2	5/73			

Cucumbers contain Vitamins A and B and are good source of Vitamin-C. They are rich in mineral salts like many other cucurbit vegetables.

PROSPECTIVE SUGGESTIONS

There are two significant suggestions that one can assert as being of great value in the future. One of this stems from the rich number of the edible genera, species and the still more abundant cultivated varieties of cucurbit fruits, that mostly happen to be indigenous to our country. The second is related to the presence of great amounts of oils, edible, essential as well as those that can be put to many other uses. The second aspect remains almost fully unexploited but is very much worth being pursued by farmers as well as industrialists. This is bound to be of great value in these days of oil scarcity, edible and industrial.

The cultivated varieties of these fruit vegetables as found widely scattered in our vast country are

surprisingly large. Every one of these varieties in addition also has its own unique speciality and desirable features as regards their taste, texture, aroma, keeping quality and so on. Moreover, most of them can also be cultivated almost anywhere. They have not been actually cultivated so, only because our farmers as well as the general public are not much aware of this richness; nor have they taken any special effort to introduce these varieties from other regions. This can be very well tried. Even "foreign" cucurbits also grow very well in India. One such very recently introduced plant which has become a profuse yielder and a remunerative plant is *Sechium edule*, or chow chow. Another such promising plant, an American one, is the Marrow, a massive fruit that grows well in India wherever it has been tried. But our farmers have not given the attention it deserves to this marrow at all.

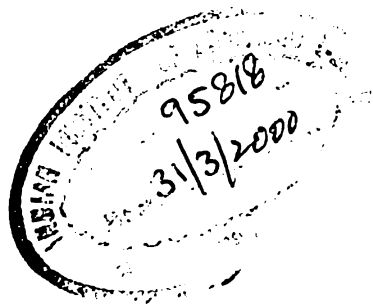
Even among the existing cucurbit vegetables, we often have unnecessary prejudices and ignorances. Most people presume that these fruits or mostly water and are not much useful nutritionally, ignoring the vitamin and the mineral contents as well as the richly protenacious nature, for example that of bottle gourd or *lauki*. *Coccinia* is another delicious vegetable which is almost unknown in Tamil Nadu for instance, though it can grow well there. Many tasty dishes can be prepared with this fruit. It can even be pickled and its keeping quality is very good. It can be cultivated easily through cutting, commencing to yield abundant fruits

within about six months and these can be had easily in any kitchen garden throughout the years. They can be consumed raw or cooked and the plant does not need much care also, needing just a pruning after the fruiting season. Almost no pests attack it. The plant therefore very much deserve greater attention than it has attracted so far. This in turn has two varieties, the large and the small fruited. The small variety is grown commercially; it is tasty and has a great keeping quality. The large variety on the contrary yields a more heavy fruit crop. Both are very remunerative crops.

As an example of a variety that needs to be popularised elsewhere one can mention the Bihar variety of the *Luffa acutangula*, a profuse yielder. Very interestingly fruits here are borne in bunches unlike the usual *torai* cultivated elsewhere. Many such examples can be given: the *parwal* and the *kantola* of Gujarat where only they are favourite, need to be popularised elsewhere also. Actually however, we have not exploited the nutritional potential of the cucurbit fruits to the degree they deserve. One example is the easy digestibility and the richy nutritions nature of the Snake gourds that Ayurvedic classics praise so much. This fact is hardly known and much less utilised as a good, dish for convalescing patient.

The oil content of the seeds of the cucurbit fruits is an aspect which we have simply ignored. This oil is quite edible in most cases, its percentage of the

yield per seed is also considerable, its extraction is easy and does not offer any problem. Most importantly we produce a great variety of these cucurbit fruits in our country. They all yield an abundance of seeds-all of which we just throw out. Except for a few promising research studies, we have not paid much care to exploit this oil wealth. It is time that our industrialists and planners look into this aspect of our existing wealth and take steps to utilise it properly.



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