



Scope of underutilized vegetables in North East region

T. S. Mishra¹, H.M. Singh² and N. K. Mishra¹

¹Krishi Vigyan Kendra, West Kameng, Dirang (Arunachal Pradesh) India

²National Horticultural Research and Development Foundation, Patna (Bihar) India

(Email: tarashankarmishra2015@gmail.com; hmsingh1983@gmail.com)

What are underutilized vegetable: These are Indigenous vegetables as might be in danger of being replaced by a few cultivated species or genetic variability of which may be lost due neglect or non.

Vegetables in India are grown from dry temperate to humid tropics between the altitudes from sea level to snow line. A wide range of plant species growing in Himalayan and sub Himalayan regions in India belonging to genus Solanaceae, Cucurbitace, Brassicaceae, besides various kinds of beans, tubers and roots crops, spices, cole crops as well as some species of leafy vegetables constitute a huge list of underutilized vegetables. These vegetables are generally eaten by the local population and rarely shipped out as commercial commodities. Though Indiangene center is rich in biodiversity in vegetable and legume crops, indigenous vegetables are in danger of being replaced by a few cultivated species and are often described with terms such as neglected and underutilized species. Some of the neglected or underutilized vegetables are detailed hereunder:

Leguminous vegetable: In India, there are several lesser known leguminous vegetable crops which have tremendous potential. The legume family is the third largest flowering plants family with approximately 650 genera and nearly 20,000 species. Out of these pea (*Pisum sativum*), cowpea (*Vigna unguiculata*), winged bean (*Psophocarpus tetragonolobus*), Indian bean (*Dolichos lablabs*), jack bean 105 (*Cannavalia ensiformis*), mucuna bean (*Mucuna pruriens*), cluster bean (*Cyamosiste tragonoloba*), etc. are important. The other beans need attention for improvement includes tree bean (*Parkiarox burghaii*), sword bean (*Cannavalia gladiata*) and faba bean (*Vicia faba*). Higher polymorphism has also been recorded in local landraces. Additionally, *Vigna radiata* var. *sublobata* is known for yellow mosaic virus resistance, whereas *V. umbellata* var. *radiata* is known for resistance to diseases and insect pests. Jack bean [*Canavalia ensiformis* (L.) DC.] is also cultivated on a limited scale whereas; winged bean (*Psophocarpus tetragonolobus*) is confined to the humid subtropical parts. Broad bean (*Vicia faba*), it is a cool-

season crop in high altitude areas, grown on a limited extent in the north eastern region. Tree bean [*Parkia roxburghii* (G.) Don.], locally known as Yonkchak, is one of the most common of multipurpose tree species in Manipur and Mizoram.

Solanaceous vegetables: Wide range of diversity in underutilized vegetable species is found in the North Eastern region of the country where *Solanum macrocarpon* L., *S. xanthocarpum*, *Cyphomandra betacea*, *Lycopersicon pimpinellifolium*, *Capsicum frutescens* L., *C. Chinenensejacq.*, *Parkia roxburghii*, are found.

The NE region is very rich in diversity for *Solanum melongena*, with several varieties having excellent quality of soft flesh, less seeds and large fruit size. *Lycopersicon pimpinellifolium* naturalized to this NE region has also expressed resistance to late blight and tomato leaf curl virus. Germplasm of wild species of tomato *L. pimpinellifolium*, has been found in NE region. Chillies are known to grow well in the warm to hot and humid climate of Manipur, Mizoram, Nagaland and Tripura. Due to the long history of cultivation, out-crossing and popularity of the crop, large genetic diversity has evolved in the form of anumber of local land races. In Manipur, six different indigenous chilli cultivarbelonging to three species of Capsicum: *Capsicum annum* L. (cvs 'Meiteimorok' and 'Haomorok'), *Capsicum lutescens* L. (cvs 'Uchithi' and 'Mashingkha') and *Capsicum chinense* Jacq. (cvs 'Umorok' and 'Chiengpi')form important food crops of the region, *C. minimum* Syn. *C. fastigiatum* (Birdeye-chilli), is cultivated all across the NE region on a very limited.

Cucurbitaceous vegetables: There are several minor/ underutilized Cucurbitaceous vegetables, which are grown in various parts of India. These are mainly *Cucumis hystrix*, *Cucumis trigonus*, *Luffa graveolens*, *Momordica macrophylla*, *Momordica subangulata*, *Trichosanthes cucumerina*, *Trichosanthes khasiana*, *Trichosanthes ovata* and *Trichosanthes truncasa*. North East region is part of the primary centre of diversity for cucumber (*Cucumis sativus*). In addition, wild relatives

of several cucurbits have also been reported from the region with significant genetic variability, such as *Cucumis hardwickii*, *Momordica cochinchinensis*, *M. dioica* etc. *C. sativus* var. *sativus* is cultivated all North Eastern region in tropical and subtropical conditions. Among gourds, in North Eastern region maximum variability has been recorded for bottle gourd in fruit shape and size. The NE region has rich diversity in genetic resources of ridge gourd (*L. acutangula*) and sponge gourd (*L. cylindrica*). Small as well as large sized forms of bitter gourd are also available. Cho-Cho (*Sechium edule*), a native of tropical America, is a very popular vegetable in the region commonly called squash and grows abundantly without much care and attention. Several lesser known cucurbitaceous crops like *Cylanthra pedata*, *Luffa acutangula*, *L. cylindrical*, *Cucumis hystris*, *Luffa graveolens*, *Momordica macrophylla*, *Momordica subangulata*, *Trichosanthes cucumerina*, *M. cochinchinensis*, *M. Dioica*, *Sechium edule* etc. are raised as indigenous vegetables.

Leafy vegetables: The important leafy vegetables include lai (*Brassica juncea*), lafa (*Malva verticillata*), palak (*Spinacea oleracea*). In addition to these a wide variety of indigenous leafy vegetables are also available. These are amaranth (*Amaranthus* spp.), puroi sag (*Vasella rubra* and *B. alba*), sorrel (*Rumex rasicarius*), etc. Other indigenous leafy vegetables used occasionally are jilmilsag (*Chenopodium album*) and Kalmou sag (*Ipomeareptans*). *Amaranthus viridis*, *A. lividus*, *A. retroflexus* and *A. spinosus* are important leafy types grown in North East India. Other indigenous leafy vegetables used occasionally are *Chenopodium album*, *Ipomeareptans*, *Amaranthus viridis*, *A. lividus*, *A. Spinosus*, *Basellarubra*, *B. alba*, *Rumex rasicarius*, *Brassica juncea*, *Malva verticillata* etc.

Tuber and rhizomatous crops: A number of Dioscorea species *Alata*, *Bulbifera*, *Brevipetiolata*, *Esculenta*, *Hamiltonii*, *Hispida*, *Kamaonensis*, *Nummularia*, *Pentaphylla*, *Puber* and *Quinata* are grown in NE region. In colocasia also there is a wide variability even within one species such as *Colocasia esculenta* *Eleocharis dulcis* (kakhthum), *Sagittoriasagithe folia* (kaukha), *Flemingia vestita* (sohphlang), *Trapa bispinosa* (heikak) are the potential species of Manipur. *Nelumbo nucifera* Gaertn. Lotus, a rooted hydrophyte has multiple uses in the valley of Manipur; it is edible apart from its religious and medicinal values.

Allium species:

Allium tuberosum (Chinese chives):

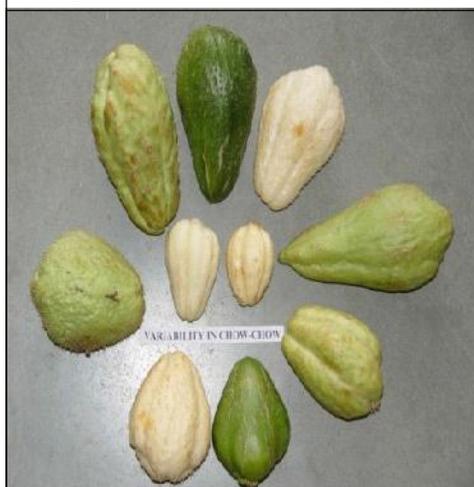
A must for every home garden or for growing in pots Chinese chives have a distinct advantage for housewives as they can substitute both the flavours of onion and garlic. Zimu, a variety of Chinese chive was developed in 1969 at college of agriculture Solan India from the local flora of mid hills of Himalaya.

Plants are perennials and tend to grow in clumps and spread by tillering growth. This new plant brought under domestication was later identified to be very close to *Allium tuberosum*. The new crop was named Zimu, which was the name given by local people to this plant. Chinese chives give grassy appearance, growing about 50 cm tall they keep on growing all the year round, making it very convenient to pinch a few leaves as and when required to garnish the dishes in kitchen, added to oblate it can substitute both onion and garlic. Nutritionally it may be superior to both onion and garlic. Watercress is native to Europe and Russia, but now grows on most continents. The Greeks and Romans believed that it cleared the mind so that decisions could be made more easily. They used it as a salve for wounds. If you rub a paste of the leaves onto a wound it will stop any infection as the leaves have anti-viral and anti-bacterial properties.

It is good eaten raw in salads and is useful for diabetics as it helps get rid of excess sugar in the blood. It is a diuretic and so good for obesity as it helps the body rid itself of excess water. It cannot help remove stones from the internal organs but it is a good preventative. Watercress aids the liver, helping it to stay healthy.

Watercress belongs to the Brassica family of vegetables along with broccoli and brussels sprouts and shares many of the same properties. It tastes a little like rocket but is less spicy, although they can be substituted for each other. A tisane can be made from 5 g of watercress to 1 cup of boiling water, steeped for 10 minutes and then strained. This is good as a diuretic and if you have a bronchial cough or cold. You can also steep 25 g of watercress in a glass of cold water overnight and strain it in the morning and take a tablespoon 4 times a day. Pep it up with the addition of cayenne pepper or black pepper. If you crush the leaves to get the juice from them you can apply this to your face to remove any skin blemishes, but to get rid of pimples you should take the tisane internally. Watercress can help with respiratory illnesses as it is an expectorant, anti-bronchitic, antiviral, antipyretic and a general tonic. It contains 13 amino acids, the B-complex vitamins, vitamins A, C and the following minerals: calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium, iodine and zinc. This

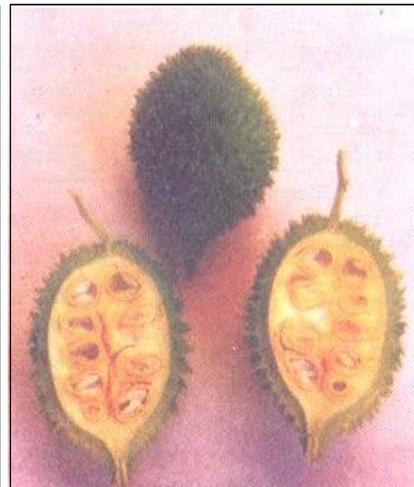
Some pictures of underutilized vegetables



Sechiumedule (Chow-Chow)



Momordica cochinchinensis Kakrol



or Sweet gourd



Cocciniagrands (Kundru) Ivy gourd



Trichosanthes dioica (Parwal)



Capsicum minimum (Bird eye chilli)



Cyphomandra betacea (Tree tomato)



Allium tuberosum (Chinese chive)

Fig. Conted.....

Fig. Conted.....



Canavalia ensiformis (Jack bean)



Vicia faba (Broad bean)



Lingra fern (*Diplazium esculentum*)



Many *Amaranthus* spp. grow in Himalayas



Bathu - *Chenopodium quinoa*



Bambusa vulgaris phyllostachysedulis



Watercress (*Nasturtium officinale* L)



Watercress (*Nasturtium officinale* L)
Watercress (Jalkumbhi)



Welsh onion- *Allium fistulosum*
Local name KAW

means that it contains a lot of antioxidants, so helps with blood flow, etc. It also contains beta-carotene, fibre and essential oil, glutotropeolin and glycosides. It has been used in the past totreat TB and Culpeper suggested the bruised leaves could be used to remove skin blemishes. An old superstition says that if you wrap watercress in redflannel and wear it when you have to go on water you will be protected from drowning.

Bamboo: Edible bamboo shoots which are under cultivation and grown wild are of *Arundinaria callosa*, *Cephalostacham capitatum*, *Bambusa balcona*, *Dendrocalamus giganteus*, *D. Hamiltonii* etc.

Lingra fern (*Diplazium esculentum*): A large number of people in the Himalayan region, particularly in remotaareas, depend on a variety of plants. In far-flung rural settlements, where vegetable cultivation is not practiced and market supplies are not organized, local inhabitants depend on indigenous vegetables, both cultivated in kitchen gardens and growing wild. Among them fern locally called is Lingra or Lingaru (*Diplazium esculentum*) is quite common. Lingra ferns grow in all moist, humus rich places under forest canopy and even on roadsides at altitudes ranging from 1,900m-2900m above sea level; they are also easily found in Dehradun, Shimla, Gangtok and other state level markets of hill states. *Lingra* has 86 per cent water content, 8 per cent carbohydrate and nearly 4 per cent protein content. The shoots and fronds of *Diplazium esculentum* have an iron content of 0.56 per cent. A comparison of the mineral contents of these wild edible species with commercial vegetable species has revealed that lingra has much higher calcium content.

The fronds are reported to cure epilepsy, urinary diseases, stings and bites, rheumatism, leprosy. Lingra is also used as a remedy against constipation and asa general health tonic. It's not just food. It serves other functional purposes aswell in everyday life. When there are heavy rains in the hills and lopping off of trees for fodder and cattle bedding (to keep warm) is not possible, inhabitants of Kedarnath Valley and other moist valleys of Uttarakhand use the mature fronds for the purpose and later produce manure by mixing them with cow dung. Bamboo shoots or bamboo sprouts are the edible shoots (new bamboo culms that come out of the ground) of many bamboo species including *Bambusa vulgaris* and *Phyllostachys edulis*. They are used innumerous Asian dishes and broths. They are sold in various processed shapes and are available in fresh, dried and canned versions.

***Alliumsiminoi* (Vernacular Name- *Sedum*):** A temperate *Allium* growing the Himalayas. In the local dialect *Sedum* isreferred as brother of garlic as it has some what bigger capsules than of garlic. Itis found in boondocks as well as also cultivated in crop fields by inhabitants of the valley. Crop emerges out from the fields in the month of August. Seeds it self fall on the fields during onset of the season where they are cultivated and further regenerate into the plantlets. *Sedum* is eaten fresh and mostly not alone, but by mixing it with potato or other vegetables. The method of cooking is more or less same as for other green vegetables. It is very nutritious and is also used to flavour local *Daal* (pulses), *Payo* (curry prepared by local curd called *Chhanch*) and other vegetables cooked.

Received : 29.08.2019

Revised : 21.10.2019

Accepted : 22.11.2019

AGRICULTURE UPDATE

An International Journal of Agricultural Extension

RNI : UPENG /2006/16372

ISSN : 0973-1520

Accredited By NAAS : NAAS Rating : 4.39

visit : www.hindagrihorticulturalsociety.co.in; www.researchjournal.co.in

RNI : UPENG /2008/24354

ISSN : 0974 - 2670

INTERNATIONAL JOURNAL OF PLANT PROTECTION

Accredited By NAAS : NAAS Rating : 4.59

The only high tech journal for Plant Protection Worldwide

For More detail contact www.hindagrihorticulturalsociety.co.in