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# Status, diversity and potential of indigenous and minor *Alliums* spp.

***Allium*** **which includes various historical vegetable crops besides onion and garlic like leek, scallion, shallot, wild garlic etc., is one of the largest genera with more than 700 species distributed throughout the world. Records of these plants have been found in the oldest known Indian Ayurvedic medical treatise, 'Charaka Samhita' as medicinal plant. Tracing its footprint, the first published monograph of** ***Allium*** **listed 24 species of the genus by Haller in the year 1745 that has eventually being increased to 750 species. Presently,** ***Allium*** **genus comprises more than 900 species including 15 subgenera and 57 sections; making it one of the largest monocotyledon genera distributed around the globe. Its region of diversity stretches from the Mediterranean basin to Central Asia and beyond. Important species of** ***Allium*** **includes onion and shallot (*Allium cepa*), garlic (*Allium sativum*), leek and elephant garlic (*Allium ampeloprasum*), Japanese bunching onion (*Allium fistulosum*), chives (*Allium schoenoprasum*), and garlic chives (*Allium tuberosum*). Further, many of its species are also grown as ornamentals, *viz. Allium giganteum, Allium christophii, Allium karataviense, Allium aflatunense, Allium caeruleum*, the nodding onion (*Allium cernuum*), the yellow flowered *Allium moly*, and the interspecific cultivar Globe master. A few *Allium* species are also noxious weeds in some parts of the world (e.g. *Allium vineale* and *Allium triquetrum*).**

INDIA exhibits about 35 to 40 species in the temperate and alpine regions of Himalayas. Known for its young bio-diversity, North Eastern Hilly (NEH) region of India, viz. Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura is home to wide varieties of *Allium* species due to its warm tropical climate. In the contending era of changing climate and nutritional importance, indigenously growing vegetable crops are being given tremendous attentions and importance. Viewing to the above entities an attempt has been made to give an insight to the major species of *Allium* that are thriving in the NEH region of India.

***Allium ascalonicum***

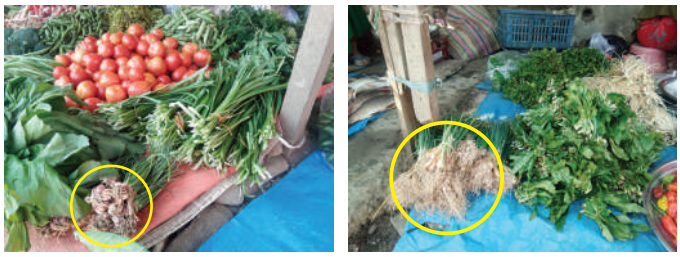
This is the most commonly used local variety in India; known with number of vernacular names such as; Arabic-*Kirath*; Hindi-*Ek kanda*, *Lahshun*, *Ek poti Lahshun*; Bengali-*Paru* or *Gandham*; Punjab-*Gandana*, *Gandhan*; Kashmiri-*Praan*; Nepal-*Chyapi*; Malayalam-*Cheriya ulli* or *Chuvanna ulli*; Tamil-*Chinna vengayam* or (*sambhar vengayam* or the onion of Sambhar) as it is an important ingredient of Sambhar. It is a 30–60 cm heigh perennial plant, generally characterized with two cloves; it occasionally reaches up to 8-10 cloves at a time. It grows in clusters and has a tapered shape which is very distinctive in nature. Cloves are of copper brown or reddish in colour exhibiting a blend of sweet onion and garlic taste. Its morphology resembles both with the onion and garlic. The bulblets resemble garlic and its texture and colour with onion. Insight of its historical values of medicinal importance that it is called as *Ek-dana-lasun* or *Ekla-kali' lasan*, meaning 'one-clove garlic, is used for curing ear-ache. It can also be fried with butter and preserved in honey and can act as aphrodisiac. Further, it was also adopted in Ayurveda as a medicinal herb. In Southern part of India, it is used as an especial ingredient of Sambhar. Shallots pickled in red vinegar are common in many restaurants, served along with sauces and papad on the condiments tray. In the NEH region it's the key ingredient for making '*momo*'. In Kashmir shallots are widely used in preparation of Wazwan Kashmiri cuisine, as they add distinct flavour and prevent curry from becoming black, which is common with onions. In the region; locally preferred over regular onion due to its strong flavour and aroma. It is one of the most important ingredient used daily just after *Allium*

*Allium ascalonicum* showing its cloves that are native to NEH region

*Allium ascalonicum* field at Durtlang, Aizawl District, Mizoram

*tuberosum* and *Allium hookeri* especially in Manipur and Mizoram. Locally known as '*Tilhou*' in Manipur and '*Purub kuwa aei chi*' in Mizoram can be abundantly seen in local markets and small side vegetable shops.

Generally in Mizoram, farmers properly wash the harvest and then carefully bundles 5-10 plants using banana stem or water soaked bamboo threads so as not to damage the leaf otherwise its monetary value resides. The bundles are sold in range of ₹ 20 per bundles to ₹ 50 per three bundles in the region.



*Allium ascalonicum* in local market (Durtlang Leitan), Aizawl District, Mizoram

***Allium chinense***

Commonly known as Rakkyo, Chinese onion, Chinese scallion, Japanese scallion, Kiangsi scallion and oriental onion, is a perennial herb. Being served as side dish or as a nutritional supplement, it is traditionally used for treating stenocardia, heart asthma, and antiplatelet aggregation. Its footprint can be observed in local markets of Meghalaya, Manipur, Mizoram, Nagaland and other

Allium chinense at Selesih, Aizawl District, Mizoram

NEH region of India. The plant height ranges from 25 cm to 50 cm. It produces evergreen bulbs with hollow bright green leaves and grows in clumps forming many well developed bulbs. Leaves are slender in nature and thin-walled, 3 to 5 angled (not round) and less stiffly erect having solid seed stalk. Its flowers are lavender in colour with long pedicels, thick perianth segments and long-exerted styles and stamens. Inflorescence bears umbel reddish purple flowers on a stalk 40-60 cm long. Unlike other *Allium* crops, it is on the side of the main growing shoot, not emerging from its centre. Generally, the umbel consists of about 5 to 25 flowers, which are hermaphrodite. The plant root can reach 45 to 50 cm depth and possesses a spherical bulb derived from a valve stem. Bulb is formed in autumn after summer dormancy with oval shape about 4 to 5 cm in diameter after the second or third year of growth. Grey-white or purple with a thin transparent skin, it has an excellent crispy texture that covers its white meat, which has a strong onion flavour at maturity. In Manipur and Mizoram and other part of NEH region, it is locally known as '*Cholam*' and '*Purun var zung lei chi*' respectively and are being used as one the key ingredient in major Manipuri and Mizo dishes. The growing *Allium Chinense* lavender colour flower blooms during November in Mizoram.

*Allium chinense* with tuber and roots

In Mizoram, their occurrences in local markets have also subsided inflicting the importance of uplifting such local herbs that are generally consumed as key ingredient in festival and ceremonial dishes. Both the leaf and roots are generally consumed as fresh and cooked. In locals it is known mostly for its medicinal values in mitigating and controlling various diseases and stresses like heart problems, headache and worms.

***Allium hookeri***

It is commonly known as Hooker chives or garlic chives; an evergreen, herbaceous and grassy perennial. In contrast to other *Allium* species, it is devoid of bulb and characterised by white fibrous roots developed from a significantly reduced underground rhizome. The leaves are linear, fleshy and green in colour with prominent midribs and membranous basal leaves length of about 20-60 cm long and flowering scapes 20–60 cm tall. Umbels are crowded with many white or greenish-yellow flowers. Flowering time starts from July to October and

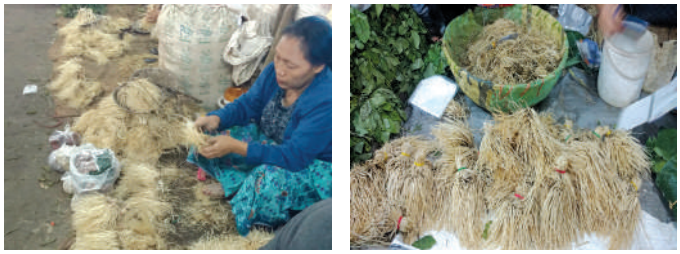
Broader leaf variety of *Allium hookeri*

the seeds ripen from August to November. The species is hermaphrodite and is pollinated by bees and insects. It grows in a wide range of soil types; suitable for light (sandy) and medium (loamy) soils and preferably moist and well-drained soil. It is suitable in all type of soil *p*H ranges. The fibrous roots and the leaves also represent the edible parts of the plant which is mostly consumed as condiments or spices. Apart from consuming as food, it is been used in ethnotherapy of certain diseases and considered of great ethno botanic relevance to certain parts of the country. The therapeutic values of *A. hookeri* are attributed to the higher concentration of total phenols (2 g/100 g dry wt.) and phytosterols (0.5 g/100 g) are known to lower the intestinal absorption of cholesterol in the body. Especially in NEH region, the major variety of the species that is found has broader leaf and locally known as '*Maroi napakpi*' in Manipur and '*Purun ahna aei chi alian*' in Mizoram.

**Uses**: It is commonly known as *Ja-ut* in Khasi. The leaves and roots are freshly consumed. Their root goes

*Allium hookeri* grown at farmer's field

Harvested *A. hookeri* at farmer's field



*A. Hookeri* roots bunch in local market (Bara Bazar), Aizawl District, Mizoram

*A. hookeri* lead bunch in local market (Pishumthong bazar), Imphal West, Manipur

well with potatoes and other vegetables thereby enhancing their taste and flavour of the dishes. This *Ja-ut* replaces the onion in curries like fish curry, fish chutney (tungtap) or phan-khleh (mashed potatoes).The raw leaves add punch to the salad. *Ja-ut* is not only used as food but is also used in treating ailments like cough, colds, digestive and circulatory system. The leaves and roots are consumed in fresh, dried and powdered form which can be stored in air tight container for preservation. It will not only add flavour to food/dishes but also maintain good health. In Manipur, it is commonly known as *Maroi napakpi,* the broader leaf. It is an indigenous condiment which is used in every dishes/curry. Local healers of Manipur have been using it for ages for medicinal purpose since it has 'nutraceuticals' property. This herb has combined property of nutritive as well as curative benefits. In General, *Allium hookeri* is an excellent food supplement and has nutraceuticals properties, it also contains as natural carbohydrates, proteins, fatty acids, and anti-oxidant properties. Its leave's juices with salt helps in curing ulcers and stomach ailments. When applied with the leave's paste of *Allium hookeri* on forehead reduces high body temperature and blood pressure. Its roots act as natural preservative because of its anti-oxidant characteristics

Being an important key ingredient in daily dishes, its demand is ever-increasing regularly. In Manipur and Mizoram, pockets of NEH Region, it is generally grown in discrete patches of land or in larger scale as per choice of the farmers. Their fibrous roots are also being consumed at large. Generally after harvesting, the roots are properly washed and then sold separately in small bundles. In local markets, the leafy section are sold in small or large bundles ranging from 10-30 and the fibrous roots are also sold in 2 to 3 root bundles at a rate of around 20-30.

***Allium tuberosum***

It is known for its high medicinal value and herbal nature with potent capacity of treating broad range of diseases and disorders covering hypolipidemic and hypoglycemic attributes. *Allium tuberosum* is used for the treatment of asthma, abdominal pain, diarrhoea, nocturnal emission and diabetes in folklore medicine. It is a perennial herbaceous plant and a late bloomer. Due to its mild garlic flavoured leaves, it's also known as 'garlic chive'. It produces 2 to 5 leaves which are 20-50 cm long and flowering scape of 25-60 cm height from underneath bulb along the rhizome. It exhibits inert contents of about 2.6% protein, 0.6% fat, 2.4% carbohydrate, 0.95% ash

**Table 1.** Diversity of Allium species in North Eastern Hilly (NEH) region

| Species | Distribution | Occurrence Status | Uses |
|---|---|---|---|
| *Allium ascalonicum* | Assam, Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Mizoram, Sikkim and Tripura | Common | Vegetables, condiment, flavour and medicine |
| *Allium chinense* | Assam, Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Mizoram, Sikkim and Tripura | Common | Vegetables, condiment, flavour and medicine |
| *Allium hookeri* | Manipur, Arunachal Pradesh, Nagaland, Meghalaya, Mizoram, Sikkim, Assam and Tripura | Common | Vegetables, condiment, flavour and medicine |
| *Allium tuberosum* | Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Mizoram, Sikkim, Assam and Tripura | Rare | Vegetable, condiment and medicine |

with small amounts of vitamins A, $B_1$ and C. Having a mild fragrance the flowers are white star shaped. It can grow by both seed or from clumps. Generally, its flowers are cut off after blooming as to avoid unwanted spread. Its seeds are black colour and triangular shaped with a hard capsule. In parts of Manipur, Mizoram, Meghalaya and Nagaland it is found in larger scale. In Manipur and Mizoram it is locally known as '*Maroi nakuppi*' and '*Purun ahna aei chi atae*', respectively.

*Allium tuberosum* in local market of Manipur

*Allium tuberosum* at farmer's field, Selesih, Aizawl District, Mizoram

Especially in Manipur it is more preferred ingredient over onion. Its leaves are sliced and fried instead of onion while preparing almost all dish of Manipur. Its importance can be felt in a way that though every household is having kitchen gardening of it, it is still sold in large scale in every local market with ample number of demand. Generally they are sold in medium to large bundles ranging from 25-50.

**Uses:** Traditionally known as *Maroi nakuppi* in Manipur, apart from being key ingredient of dish, decoction of garlic chives or whole plant is taken as vegetable for curing various liver disorders as well as gastrointestinal disorders. It helps in lessening blood glucose and serum cholesterol level. The plant has been used as an antidote for poisonous bites, and excessive bleeding can be controlled by the plant juice and bulbs contain vulnerary properties. Seeds are used for treating kidney, liver and digestive system problems. In the course of the present article on the major indigenously growing *Allium* species that are thriving in NEH region, a deep ethical grassroots in the region can be seen with profound visibility (Table 1). Further, it is seen that these species are usually used in wide varieties of major regional dishes and as potent medicines. Viewing to the unbound challenges faced by the Indian farmers and the entire population in terms of demands, price hikes nutritional declination and its security which are resultant projections of changing climates and ever increasing population these *Allium* species may outset an open door to mitigate such problems as it can readily replace some of the deficit from the common onion and garlic available in the country.

## SUMMARY

Indigenously grown *Allium ascalonicum*, *Allium chinense*, *Allium hookeri* and *Allium tuberosum* are grown/found in almost all the 8 North Eastern States. Moreover these are widely preferred for its existing taste and aroma. These species are also being more accepted over the commonly available onion and garlic in the region. It may be due to its cultural heritage and understanding in its medicinal and health benefits. Further, some of these species are being used as a key ingredient in preparation of festive and ceremonial dishes. Indian agricultural platform, being impounded by a number of affects of climatic, nutritive and socio-economic constrains, these indigenously grown *Allium* species can greatly arrest its effects. It is felt vital and important to highlight its characteristics and benefits so as to fill the voids in securing and mitigating the country's deficits in terms of food, spices and nutritional security in the contending era of changing climate and nutritional security.

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