

SOME WILD EDIBLE PLANTS OF THE WESTERN HIMALAYAS

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Indian Institute of Technology Mandi
Mandi, Himachal Pradesh, India

2021

First Edition : 2021

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Printed at :

COLLECTIVE PRINTERS

1405/XI, Phase II
Mohali. Mob.: 98148 68502

ACKNOWLEDGEMENTS

The authors feel deeply indebted to Prof. Timothy A. Gonsalves, Director, Indian Institute of Technology, Mandi, for accepting this book for publication under their Kamand Valley Monographs Publication Project.

Dr. Shyam Kumar Masakpalli, Associate Professor of Botany, IIT, Mandi, and his entire team of IIT Botanical Garden, helped the authors in many ways in field work connected with this project. The authors are highly thankful to him and his team mates.

Our cordial thanks are also due to Dr. D.R. Nag, Ex-Botanist, Department of Ayurveda, H.P., for his help in taxonomical identification of some of these plants.

Mr. Jagdish Thakur, Field Worker of the IIT Botanical Garden, was of great help for taking us to these wild growing plants in field, providing some ethnobotanical information about these plants, for bringing plant material and recipes of a few plants. The authors express a deep sense of gratitude to him.

The authors are also grateful to Smt Kamla Sharma, Junior Laboratory Assistant, Botany Department, Vallabh Government College, Mandi, Mrs. Deepika Sen of village Panjheti, Mandi, Mrs. Pushpa Parmar of Mandi, Mrs. Barjee Devi of village Sakrayar, Mandi and Mrs. Deepti Chadha of Mandi for recipes as well as the preparations.

Finally, the authors also wish to thank Dr. Suman Singroha, Assistant Professor of English, IIT, Mandi for going through the manuscript making many useful suggestions.

Chiranjit Parmar
Tara Devi Sen Thakur



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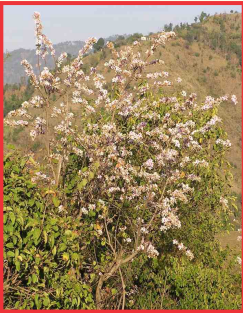
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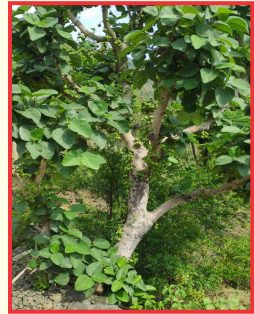
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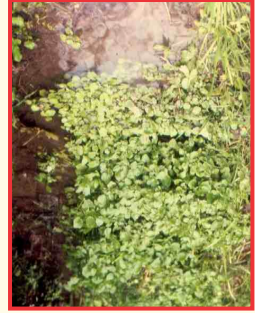
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PROLOGUE

According to the US National Academy of Sciences (1975), there are 20,000 plants in the world which yield some edible part and thus contribute towards human food. But out of these 20,000 plants, only 3000 have been exploited by man for food and only 150 plants are being cultivated on commercial scale, the rest are yet to be domesticated and cultivated. Interestingly, ninety-five per cent food consumed by man comes from 20 plants only, which indicates the extent of underutilization of available plant resources by man for food. Hence, there exists ample scope for diversification in this area. Additionally, what we are eating today may not be the best for us; some of the 17,000 plants not yet tried by man for his nutriment may turn out to be better sources of food in terms of nutritional value. Therefore, continuous search and valuation of these plants is required to make people aware of their food value. It is quite likely some of these might turn out to be new commercial food crops of the future.

In Western Himalayas dozens of fruits and vegetables still comes from the wild. In Himachal Pradesh, it is estimated that wild growing edible plants constitute a minimum of fifteen per cent of daily food requirement of the inhabitants of this State. Many of these are especially eaten on certain religious occasions. For example, the ceremonial rituals of the *Shivratri* (A Hindu festival celebrated annually marking the day of the marriage of Lord *Shiva*) are not considered complete without consuming the cooked tubers of a *Dioscorea* spp. called *taradi*. Many of these wild growing plants are also means of livelihood for the rural poor, who collect these to sell in towns. Collection of some of these plants, e.g. *Morchella esculenta* (*guchhee*), can be quite profitable due to the high price commanded by them.

In most Himachal towns, there are special points of sale where wild growing edible plants brought by local people after collecting from forests, are offered for sale. Besides these, many ethnic food preparations are also sold at these points. So there is no problem of marketing of such commodities.

An attempt has been made in this book to apprise the readers about 35 such wild growing plants consumed by the local people in the hills of Western Himalayas. The harvest from a few of these plants is traded in local markets. As mentioned earlier, the produce from one plant,

Morchella esculenta, sells for over ten thousand rupees a kilogram and is considered a delicacy in India and abroad. However, most of these plants are not known even beyond their native areas of occurrence.

Not much work has been done so far on wild growing food plants of the Western Himalayas. Most work is in the form of ethnobotanical reviews about the medicinal uses of these plants and the role of these plants for edible use has remained untouched (Bhardwaj and Seth, 2017, Shurma *et al.*, 2017). Sundriyal and Sundriyal (2011) are of the opinion that the wild growing plants are richer in nutrients than several commonly used vegetables. Sharma *et al.* (2013), have written about some wild edible plants surrounding Murari Devi areas of Mandi District of Himachal Pradesh. Kishor *et al.* (2018) have collected information on wild food plants of Himachal Pradesh from various sources.

Work has of course been carried out on wild growing fruits (Parmar and Kaushal, 1982 and Satyarthi *et al.*, 2018) some of which when immature, are cooked as vegetables and are also made into products like pickles and preserves.

Some of these plants have even escaped the attention of systematic botanists and plant explorers, and have consequently not found a place in books on botanical floras and other encyclopaedias on Himalayan plants. This book will familiarize people about the existence and utility of these plants for the first time.

It is also for the first time that information on these plants is being brought out in a systematic manner under one cover.

Since, it was not possible to find the precise botanical names of all the plants with the help of existing floras, only the name of genus of such plants has been mentioned in the book. As they appeared to have escaped the attention and scrutiny by earlier taxonomists, it will be better to describe them by local names, though there is confusion in local names too. The authors noted that in some cases the same local name was used for more than one plant. This happened in case of English names too.

It is hoped that this book will be useful in initiating future research on utilization of these plants in the development of new food crops.

01 May, 2021

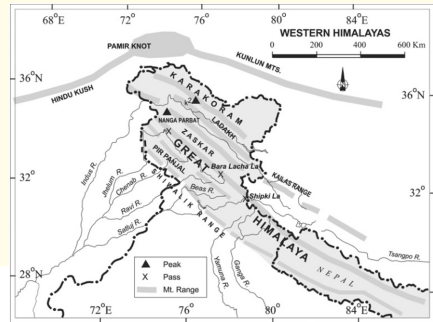
**Chiranjit Parmar
Tara Devi Sen Thakur**

ABOUT WESTERN HIMALAYAS

Western Himalayas start from Badshahkahan in North Eastern Afghanistan and extend up to Central Nepal. In India, the states of Jammu and Kashmir, Himachal Pradesh and Uttarakhand fall in this region. It supports diverse habitats, species, populations, communities and ecosystems. This area has a rich biodiversity. The vegetation comprises of sub-tropical, temperate, sub-alpine and alpine types.

The plants described in the book were selected from the Mandi district of Himachal Pradesh, lying between an elevation of 900 to 2500 metres above sea level. Rainfall received in this area is 200 to 250 cm per annum. The area is mostly hilly and comes under sub-tropical and temperate zones of the State. Soil type ranges from terai soil, forest soil, podzols, red and black soils, arid soil, mountain and hill soils to high altitude meadow soil. Inhabitants of this area are largely dependent on forest resources for their daily needs like food, medicine, fibre, fodder, dyes, body ornamentation etc.

A brief introduction about 35 such plants used by local people for food is being provided in the next pages of the book.



A map of Western Himalayas

A landscape from the study area

Agave cantala

Family: Asparagaceae

Synonyms: *Furcraea cantala*

English names: Bombay Aloe, Cantala, Cantala Fibre, Cebu Maguey, Manila Maguey

Local name: *Desi Ramban* (देसी रामबाण)

Desi raambaan plants can be seen growing in wastelands and on farm borders almost everywhere on the Himalayan mid-hills. At first glance it appears to be a useless plant and not many know that it could provide food. The shoot buds of this plant are edible and can be cooked. During the times of food scarcity in earlier times, it also served as a 'famine' food.

It may also be quite surprising for the local people to know that the familiar *desi rambaan* is not a native Indian plant but has originated in Mexico. Being a xerophyte, it can grow in very poor soils and under tough conditions. However, it seems to be very sensitive to water logging. If grown on soils which are not well drained, the growth remains stunted.

Desi rambaan plant:

It is a robust, monocarpic, xerophytic perennial herb, 4-8.5 m tall when flowering. It produces subterranean stolons (rhizomes) and suckers, and numerous, crowded leaves in a rosette; stem 30-60 cm long.

Leaves are sessile, often subrecurved, linear-lanceolate, 1-2 m x 6-10 cm, thin, widest above the middle, channelled towards the base, margins straight with erect black spines 3-6 mm long of which the tips are upcurved, spines 2-3 cm apart but reduced or lacking toward apex, apex ending in a sharp black spine up to 2.5 cm long, flat to concave-convex, dark blue-green, rough to the touch below, young leaves firmly appressed against each other (initially cylindrically inrolled) leaving impressions.

Inflorescence is a panicle borne on long peduncle, 3.5-8 m long, many-flowered; branches spreading, more or less flattened; flowers 6-8 cm long on short pedicel, protandrous, rich in nectar; perianth funnel-shaped, separated from the inferior ovary by a constriction, widened at

the apex, with 6 equal lobes; tube 12-17 mm x 15 mm, grooved; lobes oblong to linear-spatulate, 2.5-3 cm long, yellow-green, tinged purplish or reddish, on the inside of the apex with a tuft of hairs; stamens 6, inserted above the middle of the tube, filaments 5 cm long, anthers slender, purplish; ovary conical but 6-ribbed, 3-4 cm long.

Fruit not well known as it is very rarely formed.

Numerous bulbils are produced on the inflorescence after anthesis takes place.

Edible uses:

Shoot buds of *desi ramban* are edible. These are famous as famine food. Shoot buds are eaten as a vegetable during main courses and preserved as pickle for off season.

Shoot bud vegetable recipe:

Ingredients:

Chopped shoot buds, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon. red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; green coriander leaves (chopped), half a cup; ginger paste, 1/2 tablespoon; tomato puree, 2 cups; ready mixed *garam masala*, 1 teaspoon; salt, according to taste.

Method:

Remove skin of the shoot bud and cut peeled buds into small rectangular pieces. Add coriander powder, fenugreek powder, red chillies and cumin seed in sequence in hot mustard oil. Mix it well then, then add paste of onion, garlic, ginger, turmeric powder and tomato puree. Sauté this mixture on slow flame for 5 minutes before adding chopped shoot buds. Mix properly. Cook for 15 to 20 minutes till they become soft. Add *garam masala* powder and garnish with chopped green coriander leaves before serving.

Pickle of *desi ramban* shoot bud:

Ingredients:

Chopped shoot buds, 1 kg; mustard oil, 7-9 table spoons; fenugreek powder, 2 table spoon; cumin seed, 2 table spoon; turmeric powder, 1; table spoon. red chillies, 8-12. mustard (*rai*) powder, 4 table spoon and salt, according to taste..

Method:

For preparing pickle, peel off skin of shoot bud and cut into small rectangular pieces. Boil them for 5 to 10 minutes and dry in full sunlight for 5-6 hours. In hot mustered oil saute dried pieces of desi ramban with roasted seed powder of fenugreek , cumin. and red chillies, then add to this turmeric powder, mustard (*rai*) powder and salt, according to taste. Keep this mixture in a ceramic jar. After 15-20 days the shoot bud pieces will develop a sour taste and will be ready to eat.

Other Uses:

The leaf sap of *desi ramban* is used in the treatment of wounds.

A fibre is obtained from the *desi rambaan* leaves. This fibre is used for making ropes. However, this is not the most preferred material for making ropes as there are also some better alternatives available. *Desi ramban* plants are often planted as a hedge along the roadsides and in gardens, and also used to check soil erosion along rivers and brooks. It is traditionally grown as a live fence and helps inhabitants keep livestock and other animals away from the fields. Besides, it also serves as a boundary for the fields.



A plant of *desi rambaan*

Amaranthus viridis

Family: Amaranthaceae

Synonyms: *Amaranthus acutilobus*, *Amaranthus gracilis*

English names: Wild amaranth, slender amaranth, green amaranthus

Local name: *Chaulayee* (चौलाई), *Jangali Chaulai*

Chaulayee is a cosmopolitan vigorous herb that grows wild during summer season in all the warmer regions of Himachal Pradesh. It commonly grows on wastelands, in degraded forests, along the roadsides as well as in cultivated fields. Due to its vigorous growth and wide occurrence it is considered a weed in many parts of the state.

Chaulayee is eaten as a leafy vegetable. The plants collected from the wild are often sold in local vegetable markets.

Chaulayee plant:

A herbaceous annual plant, growing erect upto a height of 1 m, with erect, stem green, sometimes reddish, glabrous and is sparingly branched.

Leaves are glabrous, green, petiolate; with ovate blade, rhomboid or ovate-elliptic shaped; 3 - 9 cm long and 3 - 6 cm wide; base obtuse, apex emarginate; margin entire to sinuate.

Flowers are unisexual, mixed, densely arranged; bracts and bracteoles are similar, ovate, acuminate; petals 3, 1.5 mm long, obovate, obtuse; stamens 3, free; ovary obovoid, styles 2, free.

Achenes 2 x 1 mm, ovoid, acute, and membranous.

Seeds are biconvex, dark brown in colour, shining with hexagonal epidermal cells.

Edible uses:

Chaulayee is used as leafy vegetable. Young leaves and tender terminals are most suitable for this purpose. The most common preparation from *chaulayee* is *saag*. Sometimes *kachru* is also prepared from the leaves.

Chaulayee saag:

Ingredients:

Chopped leaves and tender tips, 1 kg; mustard oil, 3-4

tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seed, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; chopped medium sized onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; boiled potatoes and salt, according to taste.

Method:

Boil chopped leaves and tender tips till they become soft. Then mash manually or in a mixer. Sauté the mashed leaves in hot mustard oil and the spices listed above in sequence. The sautéed sag is ready and can be served as such or can be mixed with 2 or 3 chopped onions or boiled potatoes and cooked for another 5 to 10 minutes before serving.

Kachru:

Ingredients:

Besan (black gram flour) or corn flour, 1 cup; fresh coriander leaves, 1 cup; *ajwain* ½ table spoon; green chillies, 3-5; turmeric powder, ½ table spoon; chopped onions, 2-3 and salt, according to taste.

Method:

Make a paste of chopped *chaulayee* leaves *besan* or corn flour and spices. Heat some oil on a flat heating pan. Put this paste in the pan and cook for 15 to 20 minutes then *kachru* will be ready to serve.

Other uses:

Chaulayee plants grow as weed. These are fed to cattle. The *chaulayee* leaves are diuretic and purgative. These, fresh or as a dried powder, are used in poultices to treat inflammations, boils and abscesses, gonorrhoea, orchitis and haemorrhoids. (Kirtikar & Basu, 1935)

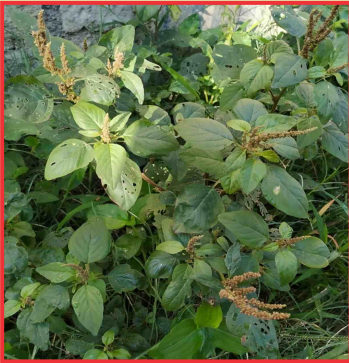
Seeds are considered as anthelmintic and in powdered form are used to cure eye diseases, vision problems and weakening eyesight. (Kirtikar & Basu, 1935)

Food value:

According to Anonymous (1985) 100 grams fresh leaves of *chaulayee* contains 87.9 per cent moisture; 2.11 g crude protein, 1.93 g crude fibre, 7.76 g carbohydrates, 0.47 g fat and 1.85 g of total minerals. The calorific value has been found to be 43.35 kcal.

Chulayee as a source of income:

Chulayee is a good source of income for the villagers in the dry season when green fresh vegetable are in scarcity. Moreover, with increasing demand for organic or chemical free vegetables, *chulayee* collected from the wild, naturally is organic. As a result, it is now more in demand such that bunches of 250-300 grams of *chulayee* easily sell for 10-15 rupees.



A wild growing shrub of *chulayee* growing by the side of road



Chulayee leaves brought home for preparing saag



Chulayee and potato vegetable



Chulayee kachru

Bambusa arundinacea

Family: Poaceae

Synonyms: *Arundo bambos*, *Nastus arundinaceu*

English name: Bamboo, spiny bamboo, thorny bamboo.

Local name: *Bans* (बांस)

Bans can be seen growing all over Himachal Pradesh. This plant is very common in the moist deciduous forests, along streams and water courses, and forms impenetrable thickets, extending over vast areas. Although it prefers moist locations, it is not very particular about the soil and can even grow on clayey and inundated soils.

Bans is a multipurpose plant and it is used in all its stages of growth, from very young age to its final maturity. Two parts of this plant viz. tender shoots and seeds provide food. The tender young shoots are cooked as vegetable. Although acrid and poisonous because of benzoic acid and cyanogenic glucoside they contain, these chemicals are destroyed by heat while cooking. The shoots are also steeped in oil and pickled. *Bans* seeds are also cooked and used like rice, but this used to happen only during the times of food scarcity.

Bans Plant:

An arborescent graceful spinous bamboo grows to 24-30 m high and 15-17 cm in dia; stems green, hollow, purplish green when young, turning golden yellow, with prominent nodes and long internodes, lower ones rooting, often sub-angular, flexuous; rhizomes short, stout and knotty.

Leaves linear or linear-lanceolate, 7-18 x 2-20 mm.

Flowers in large panicles, sometimes occupying the whole culm.

Fruit a caryopsis, oblong, grooved on one side.

Edible uses:

Tender shoots of *bans* are made into pickle. These are also cooked as curry. Seeds are also edible and are cooked like rice in the times of food scarcity.

Bans vegetable:

Ingredients:

Chopped tender shoots, 1 kg; mustard oil, 5-6 tablespoons;

coriander powder, 1 tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; green coriander leaves (chopped), half a cup; ginger paste, 1/2 tablespoon; tomato puree, 2 cups; powdered garam masala, 1 tea spoon; salt according to taste.

If it has to be made a curry, then 3-4 cups of curd and 1 table spoon of besan may also be added.

Method:

Remove the skin of the tender shoots, then cut into small long cuboid shape pieces. Fry these chopped slices for 10 to 15 minutes, keep aside. In hot mustard oil add coriander powder, fenugreek powder, red chillies and cumin seeds in sequence, mix well and add paste of onion, garlic, ginger, turmeric powder and tomato puree. Sauté this mixture on slow flame for 5 minutes. Then add fried shoots and mix. Cook for another 5 to 10 minutes before serving. For preparing curry, simply add 3 to 4 cups of curd mixed with 2 tablespoon *besan*. Cook for another 10 to 15 minutes, sprinkle garam masala powder and garnish with chopped green coriander leaves. The bans vegetable curry is ready to be served

Bans pickle:

Ingredients:

Roasted fenugreek seeds' powder, 2 tablespoon; cumin seeds, 2 tablespoon and red chillies, 8-10;

Method:

Fry shoot slices, then add to this turmeric powder, 1 table spoon; mustard (*rai*) powder, 4 table spoons and salt, according to taste. Keep this mixture in a ceramic jar for one month. Once the bamboo pieces develop a sour taste, they are ready to be eaten.

Food Value:

The tender bamboo shoots contain moisture, 88.8; protein, 3.9; fat, 0.5; carbohydrates, 5.7; and total minerals, 1.1 gram; calcium, 20.0; phosphorus, 65.0; iron 0.1; magnesium, 32.0; sodium, 91.0; copper, 0.19; chlorine, 76.0; thiamine, 0.08; riboflavin, 0.19; niacin, 0.2; vitamin C, 5.0;

choline, 8.0; and oxalic acid, 2.0 mg; and energy, 43 kcals per 100 grams of edible portion. (Tripathi, 1998)

Other Uses:

Bans' leaves are lopped for fodder. *Bans* wood has a wide range of applications, from its usage in household carpentry to making scaffolding, rafts, furniture, paper, furniture, boxes, ornamental vases, handicrafts and dozens of other items. Its stems are in great demand for manufacturing good quality paper pulp.

***Bans* as a source of income:**

Selling *bans* pickle that sells for anywhere between 200-250 rupees a kilogram can be a good source of earning for village women. Similarly, money can be earned by selling different household items of daily use made from *bans* wood.



A plant of bans



Bans vegetable

Bauhinia variegata

Family: Fabaceae

Synonyms: Bauhinia alba, Bauhinia candida, Phanera variegata.

English names: Orchid tree, camel's foot, mountain ebony.

Local names: *Karyale* (करयाले), *kachnar* (कचनार).

Karyale trees can be seen growing all over Himachal Pradesh up to an elevation of 1700 metres above the sea level. It grows wild in semi-deciduous forests, on the boundaries of agricultural fields and on the village commons. One of most magnificent flowering trees that bear not only very attractive flowers, but has a long flowering season too lasting for four to five weeks. Therefore, *karyale* trees are also planted along roadsides and parks as flowering trees.

Karyale is a multipurpose tree. The flowers as well as buds are edible. Its bark is used as medicine in *Ayurveda*. It is also a valuable fodder plant, both the leaves and the shoots, which are chopped during autumn months, are fed to cattle, as green fodder. Due to this, *karyale* is one of the trees that dominate in the agroforestry projects underway in the mid-hill regions. Public Works and Horticulture Departments also grow saplings of *karyale* to plant along the roads and other public lands.

***Karyale* plant:**

A perennial medium sized deciduous tree, up to 15 m tall; bark grey with longitudinal cracks, pale pink inside, twigs slender, zigzag; when young, light green, slightly hairy, and angled, becoming brownish grey.

Leaves rather broad than deep, simple, rigidly sub-coriaceous, deeply cordate, 11-15 nerved, divided to about 1/4 the way down.

Flowers, conspicuous, white with upper petal purplish, 8-12 cm wide, in axillary and terminal, few flowered in corymbose racemes.

Fruit a pod, 15-20 cm long, flat, hard, glabrous, dehiscent.

Seeds 15-20.

Edible uses:

Flower buds as well as flowers of *karyale* are edible. These are prepared as vegetables, as a snack called *Kachru* (कचरू) in local dialect,

are used for making *rayata* (रायता), and sometimes to make a delicious pickle.

Karyale buds' vegetable:

Ingredients:

Buds, 1 kg; mustard oil 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek seed powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; chopped onion, 1; chopped garlic, 4-6 cloves; ginger paste, ½ tablespoon; tomato puree, 1 cup or curd, 2 cups.

Method:

Boil the flower buds for 5-10 minutes. Squeeze with hand to drain out excess water. Heat oil in a pan and add buds and sauté for 5-10 minutes. Add coriander, cumin seeds, chillies, turmeric, onion, ginger, garlic and tomato puree or curd etc. in sequence. The vegetable is ready to be served.

Kachru

Ingredients:

Fresh petals, ½ kg; **besan** (black gram flour) or corn flour, 250 g; chopped fresh coriander leaves, 1 cup; green chillies 3-5; turmeric powder, ½ tea spoon; medium sized chopped onions, 2-3; salt, according to taste.

Method

Making a paste of flower petals with *besan* or corn flour and mixing it with spices. Heat some oil on a flat cooking pan and spread paste on it. Heat for 15-20 minutes occasionally turning it to other side till this mixture turns brown the petals is cooked. Serve hot with tomato sauce or ketchup.

Preparations of *karyale* flowers are very much liked due to their unique taste. These are also believed to be good for health due to several medicinal properties of *karyale*.

Food value:

According to Anonymous (1988), the nutrient content of 100 g *karyale* flower buds is like this; moisture, 78.9 g; protein, 1.8 g; fat, 0.2g; fibre, 1.3; carbohydrates, 17.8; total minerals as ash, 1.3g; calcium, 70.1

mg; phosphorus, 74.2 mg and iron, 6.1 mg. The calorific value of these buds was 54 kcal/100 g.

Other uses:

As already mentioned, *karyale* is a multipurpose tree. Nearly every part of this tree, i.e. root, stem, leaf, bark, branches and flower has some or the other use. Tree is a good source of fodder and fuel. During winter season *karyale* trees are cut for fodder. The twigs or branches left over after feeding the cattle are dried and used as a fuel. Bark is useful against skin disease and roots are used as antidote to snake poisoning. Dried flower buds are recommended for diarrhoea and vomiting (Kirtikar and Basu, 1935).

Karyale as a source of income:

Karyale trees are a good source of income for the villagers. As the flowering begins, people begin harvesting the flower buds before moving on to the flowers in order to be sold in nearby towns. People gladly pay 10-15 rupees, depending upon the season, for a paper bag containing 150-200 gm of *karyale* buds or flowers. *Karyale* preparations are considered a seasonal delicacy and are cooked at least 8-10 times during the two-month long ***karyale*** season.



A blooming tree of *karyale*



***Karyale* flowers**



Karyale* flowers picked for making *kachroo



A *kachroo* made from *karyale* petals goes very well as snack with tea.



Flower buds of *karyale* are used in many ways.



Vegetable curry made from *karyale* buds



Pickle made from *karyale* buds.



***Rayata* made from *karyale* buds is a seasonal delicacy in hills.**

Bombax ceiba

Family: Malvaceae

Synonyms: *Bombax malabaricum*, *Gossampinus malabarica*, *Salmalia malabarica*

English name: Silk cotton tree

Local name: *Simbal* (सिम्बल)

Trees of *simbal* are widely distributed over Himachal Pradesh up to an elevation of 1300 metres above the sea level. These trees can be seen growing in fields, village commons, roadsides and forests. A characteristic feature of *simbal* tree is it always grows as an isolated tree rather than in a group.

Simbal is also a magnificent flowering tree, its long blooming period lasting for four weeks.

Simbal plant :

A tall deciduous tree, with straight buttressed trunk and wide spreading branches; bark grey, covered with hard sharp conical prickles.

Leaves large, leaflets 3-7, entire, 7.5-18 cm long, glabrous, penninerved, reticulately veined, lanceolate or oval, cuspidate, acute at the base; petioles 20 cm long.

Flowers numerous, near the ends of the branches, appearing before the new leaves; calyx thick, corolla bright red, tomentose, petals elliptic oblong, recurved with close parallel veins; stamens more than 60, arranged in 5 bundles; ovary conical glabrous, style a little longer than stamens.

Fruit a capsule, 10-12 cm, ovoid, lined with white silky hairs.

Seeds 9 mm long, numerous, ovoid, packed in white cotton.

Edible uses:

The flower buds of *simbal* are used as food. The developing buds, about a week prior to their opening as flowers, are picked and cooked as a vegetable. These do not have any characteristic taste or flavour, hence the taste is somewhat flat. Therefore, a vegetable prepared from *simbal* buds needs a liberal dose of spices to make it tasty. Still, it is considered a seasonal delicacy. A pickle is also made from *simbal* buds.

Vegetable from *simbal* buds:

Ingredients:

Simbal buds, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onions, 2; chopped garlic cloves, 4-5; salt according to taste; curd, 4 cups or 2 tablespoons; tomato puree, 2 cups; chopped green coriander leaves, 1 cup; garam masala, ½ tablespoon.

Method:

Peel off the outer skin of the flower buds and cut them into small pieces. Then sauté in hot mustard oil with spices listed above and tomato puree. Cook for 15 to 20 minutes till the pieces become soft. If you do not want to use tomato puree, then add curd at this stage and again cook for 5 to 10 minutes. Garnish recipe with garam masala and chopped green coriander leaves before serving.

Other uses:

Simbal is a large tree whose wood serves many purposes. The silk around the seeds is used for stuffing pillows in villages though it is also said that sleeping on *simbal* silk pillows may affect the hearing adversely.

Spines on bark are used to treat pimples which develop on eyelids called *hakhnaal* (हख नाल) in Mandi dialect. These spines along with a drop or two of water are rubbed on a touchstone kind of stone and the paste is applied to pimples, which get cured in a day or two, an effective treatment for this ailment as I can vouch from personal experience during my childhood days.

Simbal is used as timber in house construction. It is also used as fuel.

This tree grows all over India and therefore there must be genetic variations. In Himachal Pradesh too one can observe slight variation in the colour of the flower on different trees. In this book, we have only talked about the tree found in Himachal mid-hills.



A tree of *simbal*



Immature flower *simbal* flower buds which are cooked as vegetable



A lady selling flower buds of *Bombax ceiba* (kept in basket)



Flower buds of *Bombax ceiba* buds peeled and being prepared for cooking



Mature bursting flower buds of *simbal* releasing silk cotton



Ready to serve vegetable from *bombax ceiba* buds

Cordia oblique

Family: Boraginaceae

Synonyms: *Cordia wallichii*, *Cordia myxa*, *Cordia latifolia*, *Cordia dichotoma*

English name: Clammy Cherry, Sebesten plum

Local name: *Lasura*, (लसूडा), *lassora*, *lessora*, *lasora*

Lassura is a widely distributed plant growing all over India. However, in Western Himalayas it is seen growing up to an elevation of 1500 metres only. It is a very vigorous deciduous tree that sheds its leaves at the end of winter and remains leafless for a very brief period, hardly 15-20 days. Nearly all *lassura* trees grow wild and that too scattered.

Two strains of *lassura* have been observed growing in Himachal Pradesh. One has relatively smaller fruits as compared to the fruits on the other; other characteristics of both the strains are same, although the small fruited strain is more common.

Though *lassura* tree has many uses, its most common use is cooking the fruit as a vegetable, which is considered a seasonal delicacy. the tree starts flowering at the end of April and continues till the end of May, while the fruit starts arriving in the market in the beginning of July and continues till the end of August. Besides fruits, new tender leaves are also used as a vegetable and a speciality preparation, *patrodu*, is made from them. The tree also provides fodder and wood for fuel.

Lassura fruit generally gets infested with some sort of a fruit fly whose larvae make a hole in the endocarp and eat the seed. This infestation is almost hundred per cent. Although, the larvae escape afterwards and are not seen in the fruit, the seed gets damaged and becomes unfit for sowing since it will not germinate. This is a major limitation in raising new trees of *lassura*.

Lassura plant:

Lassura is a vigorous deciduous tree which can attain a height upto 10.5 m; trunk girth upto 75.5 cm, branchlets glabrous, wood soft, light grey, there is no heartwood.

Leaves are alternate, entire to slightly dentate and glabrous, but may be more or less rough when fully grown, elliptic-lanceolate to broad ovate, often with a rounded or cordate base; basal nerves 3, rarely 5, blade 3-6, petioles 2.5-5 cm long.

Flowers are bisexual, complete, short-stalked, actinomorphic, white and glabrous, a fully open flower is 6 mm wide; inflorescence terminal or axillary cyme, almost resembling to a biparous cyme having 14 flowers per cluster; calyx cup-shaped; sepals about 4mm long, slightly dentate from top, light green in color and gamoseplous; corolla with four creamish white petals, 6 mm long, polypetalous; androecium containing two stamens, each having a very small filament and epipetalous; gynoecium bifurcated, 4 mm long and having a globose shaped ovary at the base.

Fruit a drupe, 1.3-2.5 cm long, yellowish brown when ripe, pink or nearly black, shining but minutely rugose, endocarp rugose, very hard, in a sweetish viscid, almost transparent pulp; epicarp thick, mesocarp mucilaginous, endocarp hard and stony.

Stone 8.5 × 7 mm, 298 microlitres in volume, 375 mg in weight; each stone containing two seeds, separated by a stony septum; seeds mildly sweet in taste.

Edible uses:

The raw fruits are used as vegetable, done by splitting the fruit and taking the stone out. The fruit contains mucilage and is sticky, which makes for an inconvenient handling, though rubbing oil on hands solves the problem to a certain extent.

Preparing lassura vegetable:

Ingredients required:

Lassora fruits, split and deseeded, 1 kg; mustard oil, 2 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1/4 tablespoon; cumin seed, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; chopped onion, 1; chopped garlic cloves, 4-5; tomato puree, half a cup, salt according to taste; *anardana* (Dried seeds of sour pomegranate) or *amchoor* (dried mango powder), 1 tablespoon.

Method:

Fruits are sautéed in hot oil along with the spices; coriander, cumin seeds, chillies, turmeric, onion, garlic and tomato puree etc. in sequence. Then cooked for 20 to 30 minutes till they become soft. Finally, *anardana* or *amchoor* is added, which improves the taste because the unripe fruit is highly mucilaginous and tastes alkaline. It is ready to be served.

Pickle is also prepared from unripe fruits. For preparing pickle, the raw fruit is boiled and dried in sun before sautéing with spices. Then add of a tablespoon of mustard seeds to makes it sour.

The tender leaves of the new spring growth are made into a roll called *patrodu* in local dialect, eaten both as a snack and a vegetable.

Patrodu

Ingredients:

Tender leaves of *Lassora*, 15-20; besan (black gram flour) or corn flour, 250 g; chopped fresh coriander leaves, 1 cup; green chillies, 3-5; turmeric powder, ½ tablespoon; chopped onions, 2-3; chopped leaves of herb *bhavri* (*Ocimum bacillus*), 1 cup; salt according to taste.

Method:

Make a paste of spices and *besan* or corn flour. Now take one *lassura* leaf and keeping its lower side up apply this paste over it, then cover this leaf with another leaf in reverse order and again apply paste over it. Repeat this process for 4-6 leaves and fold the sides of the leaves inside and roll like bedding. This roll is finally rolled into *patrodu* inside a big turmeric/ *Colocasia* leaf. Tie this roll with thread. Take a big pan and add some water, then place small sticks to make a rack over the water. Place the folded leaves on this rack and steam cook for 15 to 20 minutes. Take out the rolls and let them cool before cutting into small pieces. These pieces can be shallow fried or deep fried according to the taste. Serve as a snack with tea or use as vegetable.

Food Value:

Lassura fruit contains moisture, 75 g; acidity, 0.2 g; total sugars, 3.55 g; reducing sugars, 3.41 g; non-reducing sugars, 0.08 g, and pectin, 4.5 g; all per 100 g of the edible portion. The total soluble solids of the fruit pulp constitute 10.2 per cent.

The fresh fruit also contains, protein 2.06 g; ash, 2.132 g; phosphorus, 0.091 g; potassium, 1.066 g; calcium, 0.062 g; magnesium, 0.067 g; and iron 0.005 g per 100 g of the edible portion. (Parmar and Kaushal, 1992)

Other uses:

Tree is also a good source of fodder and fuel. Fodder is collected during winter season. Twig or branches left after feeding the cattle are dried and used as fuel. Fruit mucilage can be used to prepare gum.

Medicinal properties:

Lassura fruits can be used as an expectorant and are effective in treating the diseases of the lungs. In the raw condition, they contain a gum which can be used beneficially in gonorrhoea.

The fruits are also useful in treating coughs, the diseases of the chest, and chronic fever. They lessen thirst and the scalding of the urine, remove pain from the joints and the burning of the throat and are also effective in treating the diseases of the spleen. The fruits are also used as a demulcent (Kirtikar and Basu, 1935)

Lassura as a source of income:

Lassura is a seasonal delicacy and due to its medicinal value raw fruit is in great demand. Raw fruit is a good source of earning for the poor villagers. Villagers collect the fruit to sell in nearby markets or go selling door to door in nearby towns. It fetches a price of 40 to 80 rupees a kg depending upon the quality.

The village women also prepare *lassura* pickle and sell it in towns through self-help groups. The pickle easily sells at 180-250 rupees a kg.



A tree of *lassura*



***Lassura* fruits**



Fruits being deseeded for cooking as vegetable or pickle making



Deseeded fruits



Putting besan mixture on leaves for *patrodu* making



***Patrodu* ready for steam cooking**



Ready to eat *patrodu* made from tender *lassura* leaves.

Chenopodium album

Family: Amaranthaceae (Chenopodiaceae)

English name: Lamb's quarter, white goosefoot, wild spinach

Local name: *Bathu* (बाथू)

Bathu is a fast-growing seasonal weed appearing during summer months. It is especially common at places rich in organic matter e.g. in the vicinity of cowsheds and around manure pits. It grows wild more frequently in the mid hills ranging between 1200 to 1500 metres. Not a cultivated shrub, only its leaves are cooked as a vegetable.

There looks to be a lot of confusion in encyclopaedic books containing information about edible plants. Two or three types of plants are described under the heading *Chenopodium album*. The *Chenopodium album* called *bathu* locally, about which we are talking here is a small plant, 30 to 50 cm tall with a white covering on its growing tips and leaves at the end portion of the branch. It is probably due to this white covering that it's also called "white goosefoot". This white covering is harmless. The leaves are tender and without any fibre.

Bathu plant:

A polymorphous, mealy-white, erect herb, usually 30-50 cm tall; stems rarely slender, angled and striped green.

Leaves rhomboid, deltoid or lanceolate, upper entire, lower toothed 3-6 cm long.

Flowers in clusters in leaf axils.

Edible uses:

The leaves and tender terminals are cooked for food. These are mostly prepared as *saag* (साग). These leaves along stem terminals also make a delicious snack called *kacharoo* (कचरू). Since, the water content *bathu* leaves is much less than those of common cultivated leafy vegetables like mustard, spinach etc., these cook relatively faster and also possess a different taste.

Preparing bathu saag:

Ingredients:

Chopped leaves and tender tips, 1 kg; mustard oil, 2 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon;

cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; medium sized chopped onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; boiled potatoes and salt, according to taste.

Method:

Boil the chopped leaves and the tips till they become soft. Mash these with hand or in a mixer. Then sauté with hot mustard oil and the spices listed above in sequence. This sautéed saag is then ready to be served.

Kacharoo:

Ingredients:

Fresh *Bathu* leaves, ½ kg; besan (black gram flour) or corn flour, ½ kg; 1 cup fresh coriander leaves (chopped), 3-5 green chillies, ½ tablespoon turmeric powder, 2-3 medium sized chopped onions and salt according to taste.

Method:

For making a *kacharoo*, the leaves are cut into thin pieces and mixed with some gram flour besan and then rolled into a semi solid lump. Salt and necessary spices are also added to it. This lump is then rolled flat and heated on a flat pan with some oil till it gets cooked. It usually takes 25-30 minutes. These can also be used as a snack with tea or drinks.

Food value:

Chemical analysis of *bathu* leaves carried out by authors revealed that 100 grams of these contained 84.6 g moisture, 3.7 g protein, 800 mg fibre and 2.6 g of different minerals (Anonymous, 1994).

***Bathu* as a source of income:**

Bathu is not cultivated but grows in abundance in the wild. Villagers gather young *bathu* plants during the season and sell them in towns.



A plant of bathu



Kacharoo made from bathu leaves - a popular seasonal snack

Dioscorea pentophylla

Family: Dioscoreaceae

Synonyms: *Dioscorea crispata*, *Dioscorea pulchella*, *Dioscorea latifolia*, *Helmia bulbifera*

English name: Air potato, air yam, bitter yam, cheeky yam, potato yam

Local name: *Dareghal* (दरेघल)

Dareghal is a common plant found growing all over in the mid Himalayas. Sometimes cultivated, it is mainly used as a vegetable.

Basically a tuberous plant, *dareghal* also bears bulbils in its leaf axils. As these bulbils look like potatoes, it is no wonder it is also known as air potato. It is the tuber which is mostly cooked and eaten though the bulbils are also edible.

There appears a large variation in this plant, which contributes to confusion in its botanical nomenclature and popular nomenclature; several synonyms are listed for this species in different books on plants. The *dareghal* which we are talking about is the one found growing wild in Kamand area that represents the mid Himalayan region falling between 1200 to 1800 metres above the sea level. Although, said to be native of tropical Asia, it is so naturalized in this sub-temperate climate that it appears to be a local plant.

***Dareghal* plant:**

A large unarmed climber with stems twining to the left, growing up to 15 m.

Leaves alternate, simple broadly ovate cordate.

Bulbils abundant and of different sizes and shapes; in certain cultivars the tuber is suppressed in favour of rather large bulbils, which contain all the reserve food; small bulbils as a rule, warted, but they may be smooth when large.

Tuber solitary, very variable, globose to pyriform, usually small and round, but large under cultivation and weighing up to 1 kg.; skin purplish black or earth-coloured, usually coated with abundant, small feeding roots, but smooth in some cultivated varieties; flesh white to lemon yellow, sometimes marked with purple flecks and very mucilaginous.

Edible uses:

Dareghal tubers are cooked as a vegetable. Like most wild growing food plants, *dareghal* also used to be a popular food during the times of scarcity and people still use it as a seasonal delicacy. It is often sold in markets too.

Dareghal vegetable:

Ingredients:

Tubers, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; medium sized chopped onion, 1; garlic cloves, 4-5; ginger paste, 1 tablespoon; garam masala, 1 tablespoon; chopped coriander leaves, ½ cup; and salt according to taste.

Method:

Cut the washed tubers into small cubical pieces. In hot mustard oil, add coriander powder, fenugreek powder, red chillies and cumin seeds in sequence, mix well before adding the paste of onion, garlic and ginger, add turmeric powder and then sauté this mixture on low flame till it turns brown. Add chopped *dareghal* tuber pieces and stir for 8 to 10 minutes. Add 4 cups of water and cook for 20 to 25 minutes till tuber pieces become soft. Add *garam masala* powder and mix well. Garnish with chopped green coriander leaves. *Dareghal* vegetable is ready to be served with *chapatti* or rice.

Bulbils can also be cooked in the same manner, but they vary in their edible quality. The good ones have a taste and flavour like potato.

Food Value:

Underground tubers of *dareghal* contain moisture, 68.7%; carbohydrates, 77.4 %; total minerals, 2.4%; crude protein, 4.4%; crude fibre, 4.4%; crude fats, 3.5%; energy value, 1521 KJ/100 g (Anonymous, 1952).

Medicinal uses:

Both tubers and bulbils of wild races have medicinal value. They are used externally to treat wounds, sores, boils and inflammations; are applied as dressings to treat dermal parasitic and fungal infections; are crushed and mixed with palm oil and massaged onto areas affected by

rheumatism and for troubles of the breasts; dried and pounded tubers are applied to ulcers; and are also used in piles, dysentery and syphilis. (Kirtikar and Basu, 1935)

Dareghal as a source of income:

Since, *dareghal* is a seasonal delicacy and its bulbils are also used in medicine, they are in good demand. Villagers easily find buyers ready to pay 200 to 400 rupees a kg, depending upon the quality.



A vine of dareghal



Vegetable curry of dareghal tubers.



Tuber of dareghal

Dioscorea spp.

Family: Dioscoreaceae

Local name: *Singhtu* (सिंघट्टु)

Singhtu grows in upper mid-hill regions. It bears small tubers which are boiled and then prepared like a vegetable.

Although this plant grows in large number in its areas of occurrence and local people also eat it fondly, yet there is no mention of this plant in flora books of local plants or treatises like CSIR's Wealth of India or even A Dictionary of the Economic Products of India by George Watt which was published in between the years 1892–1896 and contains information on most plants besides other things. From a rough observation of this plant, *singhtu* appeared to the authors to be a member of genus *Dioscorea* and was therefore assigned the botanical name *Dioscorea spp.* Its precise taxonomic status, however, needs to be ascertained.

***Singhtu* plant:**

Singhtu is a seasonal climber which starts appearing with the warming up of weather after mid-March. It has a very thin vine that climbs on trees up to 2.5 metres. It has compound leaves (see the hand drawn sketch below) with three leaflets about 7 cm long and 1 cm wide. The vine bears small black coloured fruits that have 3-4 minute seeds. The fruits are borne in clusters of 3-6 in leaf axils. Children make toy rosaries with these. Natural propagation of *singhtu* occurs when new vines grow at places where the fruit falls.

The vines start drying from October with the cooling down of weather. They bear tubers weighing 100 to 300 grams each, located 3-4 inches deep that makes them easy to dig out and taste somewhat like potatoes. These are a favourite food of porcupine, which can be considered a major pest of *singhtu*.

Tubers are cooked as vegetable. These are believed to have a warming up effect on body during winter months. They can also be roasted by leaving them in hot ash under the burning firewood for 15-20 minutes. The bark is then peeled off and the tubers are eaten after sprinkling some salt.

Edible uses:

As already stated *singhtu* tubers are eaten after roasting these in fire, mostly by nomadic shepherds while grazing their flocks on forest meadows. In homes, *Singhtu* tubers are cooked as a vegetable to be eaten with *chapatis*.

Singhtu vegetable:

Ingredients:

Skinned or unskinned tubers, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, ½ tablespoon; red chillies, 2-3; medium sized chopped onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; tomato puree, 1 cup; chopped green coriander leaves, ½ cup; and salt to taste.

Method:

Cut tubers into small cubical pieces and sauté in hot mustard oil along with spices listed above in sequence. Add some water and cook till these become soft. Garnish the recipe with chopped coriander leaves and serve with *chapatis*.

Boiled tubers can also be cooked by simply sautéing tuber pieces in hot mustard oil with spices like coriander powder, fenugreek powder, red chillies, turmeric powder and cumin seeds in sequence. Cook for 5 to 10 minutes then garnish with green coriander leaves and serve.



A vine of *singhtu*



Tubers of *singhtu*



Boiled and sauted *singhtu* tubers

Dioscorea spp. - Taradee

Family: Dioscoriace

Local name: *Taradee* (तरडी)

Taradee is a slender vine that grows wild, mostly in the forests of mid-hill regions of Himachal Pradesh. It remains active only during the warm growing season, produces a long tuber, mucilaginous when raw, but loses its mucilage after it is boiled, and is usually harvested around Shivratri festival in Mandi area i.e. February – March. As the tubers lie deep in the soil, it is a laborious task to dig tardee root tubers, probably a reason for it to be sold at Mandi from 150 – 200 rupees a kilo.

Tardee is an important food plant from economic point of view. Every year *taradee* tubers worth several lakh rupees are sold in the market, yet surprisingly, this plant has remained unnoticed by the botanists. We have not found its mention in any of the botanical floras and also encyclopedic works like CSIR's "Wealth of India" with the result that no botanical name seems to have been assigned to it correctly.

Taradi plant:

Taradi is a slender vine, about 5 mm thick and with heart shaped leaves. It grows on slopes under the trees in forests. It plant prefers shady locations and loose soil rich in organic matter. The vines climb on small trees and bushes..

Taradi plants shed their leaves during winter and remain dormant. The growth starts again in March and continues till October. The vines flower during April-May. These bear small round, fruit like structures which are called *tardoloo* (तरडोलु) in local dialect. *Tardoloos* are, however, not real fruits. When these structures are planted in the soil, new vines emerge from them. In fact, that is how new plants of *taradi* can be raised

The edible portion of *taradi* vine is the underground flattened tuberous roots. Though the size and shape of the tubers vary with age and soil profile, these are generally about 8 cm wide and 5 cm thick. The thickening of roots starts at a depth of 50 cm from the ground. The roots have a tendency to grow straight down into the soil and if not obstructed by rock or stone, can easily go 2 to 3 metres deep. Due to which, digging out *taradi* tubers is quite a laborious job.

Edible uses:

The tubers are brittle, milky white and a little slimy from inside. They are crisp and taste starchy when eaten raw. Cooked *taradi* is also eaten or served as a *phalahar* (फलाहार) (non-cereal diet), during the ceremonial fasts observed at the time of Hindu festival of *Shivratri*.

Vegetable:

Ingredients:

Taradi tubers, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, ½ tablespoon; red chillies, 2-3; medium sized chopped onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; 1 cup chopped green coriander leaves and salt according to taste.

Method:

For preparing a vegetable, the tubers are first boiled and then peeled. These are cut into small pieces and fried in hot oil along with spices listed above in sequence. Garnish the recipe with chopped coriander leaves and serve with *chapatis*. If it is to be served with rice, then add 4 cups of water and cook for another 5 minutes.

To serve as non-cereal food during fasting, simply sauté the boiled chopped tubers with coriander powder, red chillies and cumin seed in cow *ghee* and garnish with green chopped coriander leaves before serving.

Surprisingly, *taradi* seems to have skipped the attention of botanists and farm scientists. Even the precise taxonomic status of this plant, which is a member of the genus *Dioscorea* of the botanical family *Dioscoraceae*, is not clear. Practically no study has ever been carried out on this valuable food plant. It does not find any mention even in the multi-volume encyclopaedic treatise published by the CSIR, The Wealth of India, which contains detailed information on almost every Indian plant. Some plant scientists call it *Dioscorea alata*, but they seem to do it for the sake of convenience. Morphologically, *taradi* plant does not match the description of *Dioscorea alata* given in floras.

Cultivation prospects:

High price commanded by *taradi* makes it an ideal candidate for domestication and to be developed as a new commercial crop. It is

easy to grow by planting the fruit-like structures called *tardolu* in local dialect, borne vines. The only problem is the tendency of the roots to grow downwards deep in to the soil, which can be addressed by growing these in large pots or old coal tar drums or by growing in 40 to 24 cm deep beds lined with some hard material like cement or concrete. A few *taradi* enthusiasts in Mandi have already managed to grow it by adopting this technique. The tubers can be harvested after two years, the results have been encouraging. These have also been successfully cultivated at the Botanical Garden of IIT Mandi.



A taradi plant being grown in earthen pitcher for its tubers.



Taradi tubers going deep into the soil.



Taradi tubers being sold at Mandi town.



Tardolus borne by taradi vines which can be sown for raising new plants.



A vine of taradi



Taradi vegetable

Diplazium esculentum

Family: Ploypodiaceae

Synonyms: *Diplazium serampurens*

English name: Vegetable fern

Local name: *Lingad* (लिंगड़)

Lingad, which is a fern, is one of the most popular wild growing food plants of Himachal Pradesh. Several preparations are made from it. Every ear tons of *lingad* worth lakhs of rupees is sold in the vegetable markets of Himachal towns. This entire supply of this plant comes from forests as *lingad* has still not been brought under cultivation. Besides Himachal, *lingad* also grows in the forests of Kashmir and Uttaranchal.

Lingad plants grow at humid and shady locations, mostly along streams and springs in hill forests from 1300 to 1900 metres above the sea level. The young hairy, blackish green fronds of this plant are the edible part. These are around 1 cm thick at base, 6–9 inches long, erect but coiled at the apex. These fronds are in fact leaf stalks with developing leaves at the top. Afterwards, the leaves open up, increase in size and the succulent stem turns woody, no longer fit for cooking. Therefore, it has a limited season.

Lingad is not just another vegetable. Special curries like *dum* (दम) and *madhra* (मधरा) with exclusive recipes are made from it in Himachal, served as special dishes on special occasions like marriages. *Lingad* is especially popular among the members of the Sood community of Himachal Pradesh, who have their own recipes for *lingad* curries.

Lingad plant:

Lingad is a tufted fast growing fern. It usually grows on exposed grassy slopes. This plant has a stout creeping rhizome growing in the soil which is not visible from the outside. This rhizome produces numerous fronds which are mostly tripinnate. However, the uppermost pinnae are simple.

When fully developed, the pinnae can be 0.6 to 1.8 m long and 30-60 cm wide.

Edible uses:

As soon as the weather starts warming up after winter, new

fronds start emerging as a coil. This coil keeps growing upwards and is harvested when it is 15 to 20 cm long. *Lingad* fronds are harvested and fit for cooking only at this stage.

Preparing *lingad* vegetable:

The fronds are hairy. These hairs have to be removed before cooking. It is easily done by rubbing the fronds with a thick piece of cloth. Some prefer to remove the hairy skin which is quite thin and is easily peeled off. The fronds are then cut into small pieces and cooked as per choice.

Ingredients:

Lingad fronds, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; salt according to taste; curd, 4 cups; chopped green coriander leaves, ½; garam masala, ½ tablespoon.

Method:

The fronds are cut into pieces and boiled. These are then stir fried after adding salt and spices in the sequence listed above and eaten as vegetable with *chapatis*. To prepare curries add curd and cook for another 10 to 15 minutes, then add garam masala and garnish it with chopped green coriander leaves and serve with rice.

Pickle is also prepared, which is famous in the state and is usually served with local bread like preparations *kachouri* and *siddu*.

Nutritive value:

The young tender fronds are mucilaginous. One hundred grams of fresh fronds contain 91.3 g moisture, 1.0 g protein, 100 mg fat, 1.4 g fibre, 600 mg of mineral matter. They also contain 0.98 mg/100 g of beta carotene. (Anonymous, 1953)

Lingad as source of income:

Lingad is a good source of income for the villagers, particularly the women. A discussion by this writer with *lingad* sellers in Mandi town revealed that on an average about 100 kg of *lingad* was sold daily at Mandi town in a season spanning 80 days. This quantity is worth 1,60,000 rupees at an average price of 20 rupees a kg. *Lingad* is sold in

all big and small towns of HP. So, the total annual trade in *lingad* must be worth several lakh rupees.

Lingad has to be collected from odd and difficult places located deep inside the forests. *Lingad* sold at Mandi comes from Kandhi area and the sellers are mostly from Kataula area. The villagers go to the forest to harvest *lingad* in groups of 3 to 4. A person cannot carry more than 25 kg as it has to be carried on head on arduous forest paths. The fronds are then cleaned, cut and made into small bunches at home, mostly during the night. According to *lingad* sellers, a 60 kg lot of *lingad* collected from forest costs them around 500 rupees including labour and bus fares. They say that one can make about 125-150 rupees a day from it. 36 years old Begi Devi, who has been selling *lingad* at Mandi for the past three years, says her net profit from *lingad* sale last year was rupees 15,000.

No fear of extinction:

The happiest part of *lingad* story is that unlike other useful plants harvested from the wild, there is no decline in the natural population of *lingad*. All the *lingad* sellers opined unanimously that the availability of these plants in the forest has remained the same, which might be because *lingad* plants are not dug up like medicinal herbs. As the individual fronds are cut at the ground level, the natural regeneration remains unaffected.



Lingad



Lingad fronds ready for harvesting



Village women selling lingad at Mandi town.



Lingad pickle

Euphorbia royleana

Family: *Euphorbiaceae*

Synonym: *Euphorbia pentagona*

Local names: *Chhoohin* (छूहीं), *Danda thor* (डंडा थोर)

Chhoohin is a plant of the waste lands. It is a xerophyte growing up to an elevation of 2000 metres in the hills; a common plant growing on barren rocky hills where usually very few other plants grow. It is a deciduous, cactus-like shrub, which has succulent green segmented branches that grow in whorls. Leaves, produced during the rainy season, soon fall away, so it remains leafless during most part of the year.

The stem and branches seem to be filled with white latex that starts oozing out in drops upon injury. This milky latex is injurious to the eyes. It causes bilateral conjunctivitis with corneal ulcerations and iridocyclitis. Therefore, it requires special care during extraction.

Despite this, its succulent shoots are edible. An exclusive dish, called *mitthaa* (मिट्ठा), is prepared from these. It is a sweet curry usually eaten with rice. For this, peeled pieces of the shoots are first washed in running water for ten to fifteen minutes which frees them from the toxic latex. These are then cooked. In some areas of Himachal Pradesh, *mitthaa* is the first dish to be served along with rice during ceremonial community meals.

Chhoohin plant:

Succulent spiny shrub or small tree, up to 6 m tall; branches 5-7 angled, 5-7 cm thick, angles more or less undulately winged with paired 3-5 mm long stipular spines on distinct shield, with broad flat faces.

Leaves alternate, sessile or sub-sessile, oblanceolate-spatulate, 5-15 cm long.

Cyathia sessile, in threes, yellowish; glands transversely oblong, ochreous. fruit triradiate, smooth, glabrous.

Edible uses:

For cooking, pieces of *chhoohin* are taken from relatively younger shoots. The green bark is peeled with a knife to expose the greenish white core. The peeled shoots are then cut into small pieces of desired size. These pieces are then thoroughly washed in running water so that these are completely free from latex.

We are giving here only the recipe for *mitthaa* as there is no special recipe for making *chhoohin* vegetable. It can be cooked like any of the common melons.

Ingredients:

Chopped young branches, 1 kg; Sugar, ½ kg; cow ghee, 4-5 tablespoons; fennel, 2 tablespoons; turmeric powder, 1 tablespoon; raisins from seedless grapes, 2 tablespoons; grated dry coconut.

Method:

Heat *ghee* in a pan, add fennel, turmeric powder, chopped stem pieces and sugar in a sequence. Cook till pieces become soft and turn transparent. Add raisins and grated coconut. Mix well and serve.

Other uses:

Chhoohin plant is armed with short prickles along its stems because of which it is used as a live fence and as contour hedges for soil conservation. Dried stems are used as fuelwood and sometimes as a torch.

Milky latex is effective against joint pain and is also used as anthelmintic. Ladies in Himachal villages prepare *kohl (kajal)* from the latex of *chhoohin*. It is specially used for new born and relatively younger children. Villager mothers in Mandi area of Himachal Pradesh believe that it improves vision.



Wild growing plants of *chhoohin*



Preparing a *chhoohin* branch for cooking



***Mitthaa* of *chhoohin* ready to serve**

Ficus hispida

Family: Moraceae

Synonyms: *Covellia hispida*, *Ficus oppositifolia*, *Covellia oppositifolia*

English name: Hairy Fig

Local name: Debre (डेबरे)

Debre trees grow wild in the mid-hills of Himachal Pradesh up to an elevation of 1100 metres above the sea level, mostly along the water streams, forest edges, and in open spaces along the base of foothills.

Debre fruits are eaten both unripe and ripe. While, the green unripe fruit is cooked as a vegetable, the ripe fruit is eaten when it turns pale green or greenish yellow at maturity.

Debre plant:

A shrub or small tree with a spreading crown, all parts more or less hispid-pubescent.

Leaves usually opposite, petiolate, membranous, 10 by 5 cm, ovate, oblong, or subovovate or shortly or abruptly acuminate, toothed or entire, lower surface hispid or pubescent, upper surface hispid scabrid, base rounded, sub-cordate or sub-cuneate, 3-5 nerved, stipules 2 on each leaf.

Receptacles 1.3 to 2.5 cm across, turbinate, obovoid or subpyriform, yellowish when ripe, slightly umbonate, hispid and sometimes with bracts scattered along the sides or peduncles; male flowers rather numerous, near apex of receptacle, sepals 3, concave, hyaline; stamen 1, anther broad, filaments short; gall flowers pedicellate; fertile flowers thin, achenes ovoid, style lateral, stigma cylindrical, tubular.

Fruits 2 - 2.5 cm wide, initially green, greenish yellow or pale green when ripe, sweet, and edible.

Edible uses:

Ripe fruit tastes sweet and is eaten fresh. The unripe fruit is cooked as a vegetable.

Vegetable:

Ingredients:

Debre fruits cut into small pieces, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1

teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; medium sized red chilies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; tomato puree, half a cup; salt, according to taste.

Method:

Peel off the fruit skin and boil the fruit till it becomes soft. Let it cool before mashing with hand. Sauté in hot oil by adding spices mentioned earlier in the same sequence. Cook for 5 to 10 minutes. The vegetable is ready to be served. It is usually served with *chapatis*.

Other uses:

Debre has many other uses besides being used as food. The tree is chopped for fodder during the winter season, the twigs or branches left after the leaves have been eaten by cattle are dried and used as a fuel.

The wood is soft and light. The bark contains tannin (2.1%), wax, caoutchouc and a glucosidic principle. It also yields a rough fiber.



Bearing in *debre* tree



Picking *debre* fruits for use in kitchen



Fruits of *debre*



Dry vegetable made from *debre* fruits.

Ficus palmata

Family: Moraceae

English names: Wild fig, wild Himalayan fig

Local names: *Fegra* (फेगडा), *khasra* (खसरा), *daghla* (दाघला).

Fegra trees are common throughout the mid-hill region up to an elevation of 1550 metres. Besides Himachal Pradesh, this plant also grows in areas having similar climate in the neighbouring states of Uttarakhand and Jammu and Kashmir extending up to the mid-hills of Pakistan.

Fegra trees grow in wild only. Interestingly, it is found only in inhabited areas, mostly in fields and village common lands and rarely seen in forests.

Ripe fruit of *fegra* is one of delicious fruits that grow wild in Himachal Pradesh. In taste, they match the best varieties of cultivated fig, but because its small size, and also because of the presence of latex at the pedicel end, which unless removed by washing, causes unpleasant irritation in mouth, it cannot offer competition to the cultivated fig. So these are eaten by the locals only and never reach the market.

The unripe fruit of *fegra*, called *fegri*, is cooked as vegetable. Local people consider *fegri* vegetable a seasonal delicacy and is in demand during the months of February – March.

Fegra plant

Fegra is a moderate sized tree. Its height varies from 6-10 metres. It sheds its leaves during the winter months when it becomes leafless for a few weeks. It has a dull smooth grey coloured bark that can be stripped off with hand. The new branches are mostly hairy.

Fegra tree has broad, ovate and membranous leaves measuring 13 cm in length and are a little over 14 cm across. The upper surface of the leaves is dark green and rough. The lower surface of the leaves is light green and hairy.

Flowers are tiny and not visible from outside as these are borne on a fleshy receptacle which is curved acquiring a lobular shape. It is this receptacle which grows into a fruit. There are hundreds of flowers of both sexes enclosed in this round receptacle which has a very small

opening at its apex. The pollinating insects enter and come out of the fruit via this opening.

Fruits vary in size from tree to tree and also depend on the proximity of the tree from the source of water. However, on an average these are 2.5 cm wide and weighing 6 g each at maturity. The colour of fully ripe fruits is deep purple to black. The fruit is juicy and taste very fine. The fruit has to be washed in water to make it latex free, which otherwise irritates the tongue.

Edible uses:

The unripe fruit, about 1.5 cm wide, is plucked and is cooked as vegetable.

Vegetable:

Ingredients required:

Fegri fruit, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; salt as per the taste; *anardana* (Dried seeds of sour pomegranate) or *amchoor* (dried mango powder), 1 tablespoon.

Method:

Boil *fegri* in water for fifteen minutes. The boiled fruit, which gets cooked in this process, is squeezed with hand to drain out excess water. It is then sauted in oil with the spices listed above in sequence. Some *anaardaana* or *amchoor* is also added to make it a bit sour which improves the taste and then served.

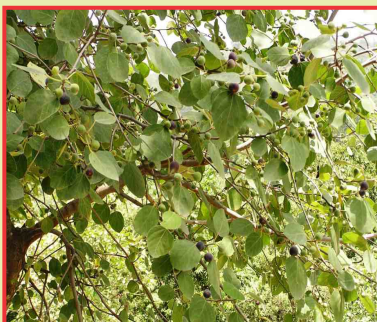
As stated earlier, *fegri* is considered a seasonal delicacy. Although there is no data available on nutrient content of *fegri*, it is believed that eating *fegri* vegetable is very good for health as it is supposed to impart resistance to the body against many ailments. Elderly people in the villages opine that one must eat *fegri* vegetable 4-5 times during the season which will save one from many health problems during the coming months.

***Fegri* as a source of income:**

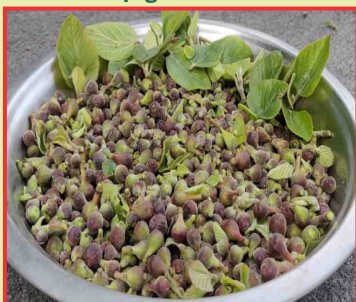
Fegri season lasts for 4-5 weeks, during which, villagers collect it and sell in towns. 200-250 grams of *fegri* fetches around ten rupees.



A tree of fegra



Fruit bearing in fegra tree



Raw fruits of fegri for preparing vegetable.



Boiled fruits of fegri



A village woman selling fegri fruits at Mandi town.



Vegetable curry made from fegri fruits.

Ficus roxburghii

Family: *Moraceae*

Synonyms: *Ficus auriculata*, *Ficus macrophylla*.

English name: Elephant ear fig tree.

Local Names: *Taryambal*(तर्याम्बल), *Timbal*, *Tremal*, *Trembal*, *Taryambalu*.

Taryambal grows commonly in the mid-hills up to an elevation of 1700 m. It grows wild in forests, village commons, cultivated fields, grasslands etc. as a single tree. A vigorous tree, it can become big if the soil contains organic matter and if there is a water source nearby.

Taryambal is a multipurpose tree. The main produce is fruit, which when unripe is cooked as a vegetable. The ripe fruit, though not very sweet, is much liked for the jelly like substance it contains. The large leaves are used as leaf plates to serve food in village community functions, for which 3-4 leaves are stitched together with pins made from bamboos. The leaves are also fed to cattle.

Taryambal Plant:

A deciduous woody tree, having a short trunk, which soon divides into a few stout laterals, which further branch irregularly, spreading in all directions; height 10-12 m, bark smooth, gray, with a tinge of yellow or green..

Leaves exstipulate, petiolate, each having a 8.5 cm-long petiole, deciduous, obtuse, cordate, entire to undulate, alternate, 21.5 cm long, 23.5 cm. broad, having reticulate venation.

Flowers unisexual; inflorescence hypanthodium, both the male and female flowers borne on the fleshy receptacle, male flowers, 4 mm long, the female flowers 6 mm long, calyx and the corolla, modified into threadlike scales, stamens very small, about 2 mm long; style long, deeply two-branched; ovary, single, ovoid.

Flowering begins from the first week of March and continues till the end of April.

Fruit a syconoid, globose, having a 4.5 cm long stalk, 4.5 cm in diameter, 30.5 g in weight, 30.1 ml in volume; the apical opening of the fruit guarded by scales; mature fruits yellowish to purple; pulp, light red.

The fruit is, in fact, a fleshy receptacle, enclosing a number of true

fruits or achenes, which develop from the female flowers lying within this receptacle.

The fruits start ripening in the first week of June and continue till July end.

Seeds, numerous, very small, eaten along with the fruits.

Edible uses:

The raw fruit is used as vegetable. A preparation made from the new tender leaves, called *patrodu* (पत्रोढ़) in the local dialect, is also popular.

Preparing taryambal vegetable:

Ingredients:

Taryambal fruit cut into four pieces, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; tomato puree, half a cup; salt, according to taste.

Method:

Boil the fruit till it become soft and let it cool. Then mash it manually and sauté in hot oil by adding spices mentioned above in the same sequence. Cook for 5 to 10 minutes. The vegetable is ready to be served. It is usually served with *chapatis*.

Preparing patrodu:

Ingredients:

New tender leaves, 15-20; *besan* (black gram flour) or corn flour, 250 gm; fresh coriander leaves (chopped), 1 cup; green chillies, 3-5; turmeric powder, ½ tablespoon; medium sized chopped onions, 2-3; chopped *bhavri* (*Ocimum bacillus*) leaves, 1 cup; salt, according to taste.

Method:

Make paste of spices and *besan* (or corn flour) by mixing together. Take one leaf and keeping its lower side upward apply this paste over it then cover this leaf with another leaf in reverse order and again put paste over it. Repeat this process for 4-6 leaves and fold side of the leaves inwards and roll like bedding. Tie it with thread or wrap inside by

large turmeric leaf to make it one piece. Take a big pan and put some water in it. Place small sticks of wood to make a rack over the water. Place the leaf rolls on this rack and steam cook for 15 to 20 minutes. Take out the rolls and let them cool down. Then cut these into small slices. These slices may then be shallow or deep fried according to one's taste and served as snack with tea or eaten as vegetable.

The ripe fruit tastes fairly sweet. It is filled with an attractive jelly-like substance much sweeter than the pulp. The absence of acidity, however, makes it slightly flat in taste. The overall fruit quality is good.

Food value:

Food value of only the ripe fruit is available. It contains 87.1 per cent moisture and 7.5 per cent total soluble solids. The total soluble solids of the sweet jelly-like substance, however, are 9.9 per cent. The fruit is almost devoid of acidity; the total sugars are 6.15 per cent; the reducing sugars are 6.12 per cent; the non-reducing sugars are 0.03 per cent and pectin is 0.48 per cent. The vitamin C content of the fruit is only 3.35 mg per 100 g.

The protein content of the fruit is 0.59 per cent. The fully ripe fruit contains 1.068 per cent total minerals, as represented by its ash. The percentage content of some of the mineral elements in the fruit, viz., phosphorus, potassium, calcium, magnesium, and iron is, 0.039, 0.331, 0.039, 0.045 and 0.003 respectively. (Parmar and Kaushal, 1982)

Other uses:

As stated already, *taryambal* is a multipurpose tree: a source of food, fodder, fuel wood, household items and medicine.

Tree is cut for fodder during the winter season. Its leaves are liked by cattle. The leaves are also used as plates during feasts in the villages by stitching 3-4 leaves together. Twigs or branches left over after feeding the cattle are dried and used as fuel.

The latex from the stems is applied to cuts and wounds, and fruit is effective in the treatment of diarrhea and dysentery. The possibility of jam-making from this fruit should also be explored.



A tree of taryambal



Taryambal leaves made into plates for serving food during marriages and other community meals.



Immature fruits of taryambal for cooking.



Young taryambal fruits boiled for preparing vegetable



Dry vegetable made from taryambal fruits.



Vegetable curry of Taryambal fruits

Indigofera atropurpurea

Family: Fabaceae

Synonyms: *Indigofera cavaleriei*, *I. violacea*, *I. cassioides*, *I. elliptica*

Local Name: *Kathi* (काथी)

Shrubs of *kathi* can be seen growing from 300 to 1900 metres above mean sea level, mostly on mountains, sparse forests or grasslands near trail sides or streams in sunny locations. Though it can succeed in drier and poorer soils, yet the best performance is in well drained moist soils.

Kathi has attractive flowers and though landscape architects often suggest it be used for landscaping, its cultivation has not yet begun. Only sample plants can be seen in botanical collections.

It flowers during the months of August and September depending upon elevation. Flowers are used as food and find usage in traditional medicine also.

***Kathi* plant:**

Kathi plant is a shrub or small tree, growing 1.5-5 m high; stems brown, terete, with round lenticels; young branches green, angular, with appressed white or brown medifixed symmetrically.

Stipules are lanceolate-subulate, 3-5 mm, caduceous; leaves 2.4 cm, (7-)11-19(or 21)-foliolate; petiole and rachis with appressed white and brown medifixed trichomes; petioles 2.5-3.5 cm; rachis flattened or adaxially slightly grooved; stipels subulate, as long as petiolules; petiolules 1.5-2.5 mm; leaflet blades opposite, ovate to elliptic, 1.5-6.5(-8) × 1-2.5 cm, membranous, both surfaces with appressed medifixed trichomes or adaxially glabrous, midvein abaxially prominent and adaxially impressed, secondary veins 8-10 on each side of midvein, base broadly cuneate to rounded, apex obtuse, emarginate, or acute and mucronate. Racemes 8-15(-28) cm; peduncle and rachis with sparse appressed medifixed trichomes; peduncle 1.5-2.5 cm; bracts ovate to ovate-lanceolate, 2.5-3.5(-5) mm, abaxially with appressed brown trichomes.

Pedicele is 1.5 mm; calyx 2.5 mm, with dense appressed grayish brown medifixed trichomes; teeth triangular, 0.5 mm; corolla dark purple, standard elliptic, 7-8.5 × 4.5-5.5 mm, glabrous; wings 7-8 mm, margin apically ciliate; keel 7.5-8.5 mm, outside apically hairy, margin

ciliate; stamens 6-7 mm; anthers globose, base with a few trichomes; Ovary glabrous, with 6-9 ovules.

Legume cylindrical, 2.5-5 cm, with sparse appressed trichomes when young, glabrescent when mature, sutures thickened; endocarp not blotched.

Seeds 6-9 per legume, rufous brown, cubic, ca. 1.8 × 1.5 mm.

Edible Uses:

Only flowers of *kathi* are eaten, which are made into *kachru* (कचरु) or *bhalle* (भल्लो), the local preparations usually eaten as snacks.

Preparation:

Ingredients:

Fresh flowers, 1 kg; *besan* (black gram flour) or corn flour, ½ kg; fresh coriander leaves (chopped), 1 cup; caraway (अजवायन), ½ tablespoon; green chillies, 2-3; turmeric powder, ½ tablespoon; chopped medium sized onions, 2-3; and salt, according to taste.

Method:

Make a paste of flower petals, *besan* or corn flour and spices. Heat some oil on a flat pan. Put some paste over the pan and make it flat by pressing with fingers. Cook for 15 to 20 minutes. *Kachru* is ready to be served. Repeat this process for rest of the paste.

Other uses:

As *Kathi* is a leguminous plant so it has a symbiotic relationship with certain types of soil bacteria. These bacteria form nodules on the roots and fix atmospheric nitrogen. While some of this nitrogen is utilized by the growing plant, it can also be used by other plants growing nearby.

Kathi plant is also a good source of fodder. People in Mandi area al boil its flowers in water until the volume water is reduced to half; the remaining liquid is given as a treatment for diarrhoea and dysentery.

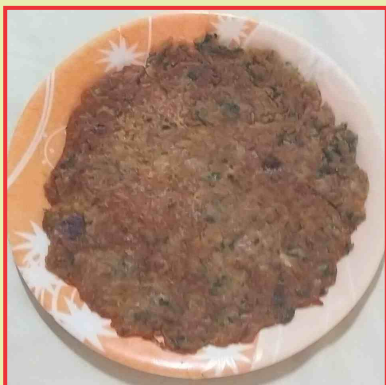
Its twigs are strong and durable, and are used extensively for making baskets and similar containers.



A kathi plant in full bloom



Kathi flowers



A kachroo made from kathi flowers.



Collecting kathi flowers for use.

Medicago polymorpha

Family: Fabaceae

Synonyms: *Medicago denticulate*. *Medicago hispida*

English name: Bur clover

Local name: *Khokhna* (खोखना)

Khokhna plants grow at moist places, on the roadsides or cultivable fields when winter ends and summer is about to begin. It is a very short lived annual which completes its life cycle in about ten weeks. The local people use it's leaves to prepare *saag*. However, it is not very popular and is prepared just 2-3 times during the season for a change.

Khokhna is consumed locally and not offered for sale.

Khokhna is native to western and central Asia and countries around the Mediterranean. It has now spread to all parts of the world and has been introduced widely around the world. It is found in particular regions with a Mediterranean climate but is by no means confined to them. Introduction of *khokhna* has taken place as result of accidental transport of the spiny seed pods.

Khokhna has been referred to as “bur clover” in English books on plants. In botanical treatises it has been assigned the botanical name, *Medicago polymorpha*, *Medicago denticulate* and *Medicago hispida* too. It is reported to be present all over India, but there seems to be a lot of variation, and it may be that *khokhna* plants of Kamand region are not the same as those in other parts of India or outside India.

Khokhna plant:

Khokhna is an annual herb, 20-90 cm tall, having prostrate or ascending stems, branched at base.

Stipules are ovate-oblong, 4-7 mm, base auriculate, margin irregularly laciniate or deeply incised, apex acuminate; petioles long and thin, 1-5 cm; leaflets obovate or triangular-obovate, 7-20 × 5-15 mm, papery, sparsely hairy abaxially, glabrous adaxially, base broadly cuneate, margin shallowly serrate in apical 1/3, apex obtuse, truncate, or emarginate, apiculate.

Flowers 2-10 in axillary racemes; peduncles slender, 3-15 mm, usually longer than leaves; pedicel less than 1 mm. Corolla yellow, 3-4 mm; standard obovate, emarginate.

Legume ash-green to greenish brown, discoid, 4-6 mm, tightly coiled in 1.5-2.5 spirals, turning clockwise, radial veins connected near edge on coil face, spines or tubercles 15 in each row.

Seed brown, reniform, ca. 2.5 × 1.25 mm, smooth

Edible uses:

Leaves and tender shoot tips are plucked and cooked as *saag* or in combination with potatoes.

Saag:

Ingredients:

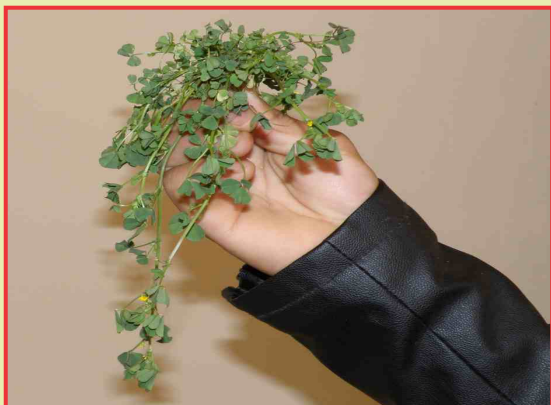
Chopped leaves and tender shoots, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; medium sized chopped onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; boiled potatoes and salt, according to taste.

Method:

Boil chopped leaves and tender shoots till they become soft. Then mash manually or in a mixer and sauté with hot mustard oil and the spices listed above in sequence. This sautéed *saag* is then ready and can be served as such or can be mixed with 2 or 3 chopped onions or boiled potato and cooked for another 5 to 10 minutes before serving.

Nutritive value:

Analysis of *khokhna* plant gave the following average values: dry matter, 20.8; protein, 5.1; fat, 1.7; fibre, 3.9; N-free extract, 7.8; and mineral matter, 2.3%. They are very rich source of ascorbic acid containing 850 mg per 100 g. (Anonymous, 1962).



A plant of khokhna



Khokhna leaves and tender shoots collected for cooking.



Khokhna saag ready to serve

Momordica dioica

Family: Cucurbitaceae

Synonym: *Momordica hispida*

Local name: *Jangli Karela* (जंगली करेला), *Ban karela* (बन करेला).

The climbing vines of **jangli karela** can be seen growing wild on hedges and short shrubs all over Himachal Pradesh up to an elevation of 1200 metres. They scramble over the ground and also climb over the surrounding vegetation attaching themselves with the help of their tendrils. However, it is not a commonly growing plant and is not at all cultivated.

In books on Indian plants, *Momordica dioica* is stated to be growing all over India, including areas having tropical climate. This seems to be a bit confusing as the same species cannot grow under such diverse climatic conditions. It seems that plant specimens from all areas have not been studied. It is quite likely that the *Momordica dioica* specimens from Himachal Pradesh vary from those from Central or South India.

The young green spiny fruit is cooked as a vegetable relished by local people. It is not bitter like the cultivated *karela* (*Momordica charantia*). The roots of *jangli karela* are tuberous. These are also said to be cooked in some parts of India, but not in Himachal Pradesh.

Jangli karela plant:

Jangli karela is a perennial climber, having unbranched, glabrous tendrils, dioecious; root tuberous.

Leaves are broadly ovate, membranous, 6.0 x 5.0 cm, glabrous on both sides, deeply 3-5-lobed, lobes triangular ovate or oblong, acute, with undulate or minutely remotely denticulate margin; petiole 1-3 cm long, puberulous.

Male flowers are 5-6 cm across, yellow, on 4-6 cm long peduncles; bracts large, sessile, entire, glabrous, often ciliated or villous on both surfaces, cucullate, suborbicular or reniform, partly enclosing the flower; petals measure 2-3 x 1.5-2.5 cm, obtuse; female flowers yellow, on 2.5 cm long, ebracteate or minutely bracteate peduncles; calyx lobes linear-lanceolate, 5-6 mm long, villous; corolla similar to male flowers; ovary is ovoid, covered with long and soft papillae.

Fruits are ovoid or ellipsoid, 3-5 cm long, 2-3.5 cm across, yellow when mature, densely covered with soft spines, shortly beaked (rostrate) at apex.

Seeds are somewhat compressed, 6-7 x 5-6 mm, irregularly corrugated.

Edible uses:

The spiny fruit of *jangli karela*, when unripe, is cooked as vegetable. Here is the recipe for this vegetable.

Ingredients required:

Raw fruit, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; tomato puree, half a cup; salt, according to taste; *amchoor*, one heaped tablespoon; garam masala, ½ tablespoon.

Method:

Cut round slices of fruits and sauté in hot oil along with whole spices like coriander, cumin seeds, chillies, turmeric, onion, garlic and tomato puree etc. in sequence. Cook for 20 to 30 minutes till they are soft. Then add *amchoor* and cook for another 4 to 10 minutes and garnish with garam masala before serving.

Food Value:

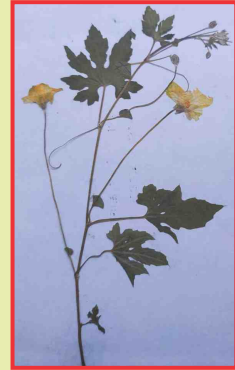
One hundred grams unripe fruit of *jangli karela* are reported to contain 84.1 g moisture, 7.7 g carbohydrates, 3.1 g protein, 3.1 g fat, 1.1 g minerals and small quantities of essential vitamins like carotene, thiamine, riboflavin and niacin. (Singh, et al., 2009)

Other uses:

A semidrying oil is extracted from seed kernels.

Fruits, leaves, and tuberous roots of *jangli karela* are used as a folk remedy for diabetes mellitus in India. The aqueous extract of fruit is reported to possess anti-diabetic activity and is having high margin of safety.

The tuberous root is also used in medicine. Roots of female plants are larger than those of the male plant and are preferred for medicinal uses. They are applied in bleeding piles and urinary complaints. The root paste is applied over the body as a sedative in fever. (Kirtikar and Basu, 1935)



A plant of *jangli karela*



Fruits of *jangli karela*



Ready to serve vegetable of *jangli karela*

Morchella esculenta

Family: Agaricaceae

Synonym: *Agaricus procerus*

English name: Honey combed mushroom, morel.

Local name: *Guichchhee* (गुच्छी)

Guchchhee is the highest priced mushroom in India and probably are one of the most expensive mushrooms in the world. Dried *guchchhees* sell from 12,000 to 15,000 rupees a kilo. So, naturally it is a delicacy eaten only by the very rich people in the cities, besides the villagers who collect this mushroom from the forests.

Guchchhee grows wild in hill forests between elevations of 1500 to 3000 metres, all efforts made to domesticate it have so far remained futile. It starts appearing soon after the snow melts and continues till the end of April. In some places at lower altitudes, a second crop also appears in August. The yield, however, is much less and the quality is also not like the first crop. It has been noticed that these off-season ones usually appear in orchards that have large trees.

It has also been noticed that *guchchhees* appear relatively more in forests affected by forest fires during the previous season. Mr. Jai Chand, a botany student hailing from Chuhar Valley, who has gathered *guchchhees* since childhood, has noted that this mushroom prefers to grow under or in proximity of the wild growing creeper *murangha* (*Ampelocissus rugosa*). He says that *guchchhee* collectors of his village first look for this creeper and then search the ground for *guchchhees*, which are usually hidden or partially visible in grass or leaves.

All *guchchhees* have white stalk while the top has a variable colour ranging from yellowish brown to olive. These attain full size in 5-6 days weighing about two grams each. Fresh *guchchhees* taste better than the commercially available dry *guchchhees*.

Guchchhee plant:

Ascocarps (Upper part) grayish to yellowish sponge with large pits and ridges up to 12 cm in height, apothecia up to 15 cm in diameter, pileus surface up to 8 cm, grayish to yellowish, spongy, pitted, ridges, grooves, pits rounded irregularly arranged often fused with whitish stipe; flesh up to 5 mm in thickness, spongy, spore deposit almost whitish.

Lower part or stipe, constituting 20-30 per cent of total weight, up to 8 cm long, 2 cm broad, white to yellow, flesh soft, spongy, hollow, bulbous base.

Taste and odour mild.

Edible uses:

Guchchhee is used as vegetable. In villages where people collect this mushroom from forests, fresh *guchchhees* are used, at other places, dry *guchchhees* are used. Dry *guchchhees* need to be soaked in water overnight before cooking. These are mostly cooked in combination with potatoes and *aloo guchchhee* is the most popular *guchchhee* preparation and is eaten with rice.

Fresh *guchchhee* vegetable:

Ingredients required:

Freshly harvested *guchchhee*, 1 kg; mustard oil, 3-4 table spoons; coriander powder, 1 tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; tomato puree, half a cup, green coriander leaves (chopped), ½ cup; *garam masala*, ½ tablespoon; salt, according to taste.

Method:

Guchchhee pieces are sautéed in hot oil along with whole spices like coriander, cumin seeds, chillies, turmeric, onion, garlic and tomato puree etc, in sequence. Then cooked for 20 to 30 minutes till they become soft. The dish is garnished with chopped green coriander leaves and *garam masala* before serving.

***Guchchhee* as source of income:**

The collectors set out in the mornings with a target of collecting at least half a kilogram of *guchchhees*. However, as Mr. Jagdish Thakur, a worker at IIT Mandi's Botanical Garden, a regular *guchchhee* collector himself, says, it all depends upon luck.

The fresh *guchchhees* are cleaned and sun dried. Since, the moisture content of fresh *guchchhees* is 93.85 per cent, the final retention is around 10 -12 per cent of the actual collected. According to Mr. Jagdish Thakur, some unscrupulous collectors dip fresh *guchchhees* in salt solution for some time, which results in small increase in weight.

Villagers get around 6000 rupees a kilo for their collection from local traders who send it to traders at nearby towns and make a small profit of 500 rupees. The produce then goes to the plains. A family may earn eight to ten thousand rupees annually from *guchchhee* collection, while the government also earns around 100 rupees per kilo by levying an export tax payable to the village panchayat.

Myths about *guchchhees*

There are several myths about the emergence of *guchchhees*: some attribute it to the cloud thunders during winter rains, some associate it with particular soil and winter weather. However, there does not seem to be any conclusive evidence or any set principle about its growth. Surprisingly, *guchchhee* which ordinarily grows only in forests, has been seen inside some residential buildings in the villages and even at Mandi. This indicates that this prized mushroom does not mind growing outside its normal habitat, so the scientists should not lose hope about cultivating it.



Guchchhees growing in the forest



Collectors holding dried guchchhees.



Guchchhees soaked in water before cooking



Curried vegetable from guchchhee

Morus alba

Family: Moraceae

English name: White mulberry

Local Names: *Chimmu* (चिम्मू), *toot* (तूत).

According to botanists, **chimmu** is a native of China. In fact, mulberry, the common name that refers to all types of mulberry trees, has many forms but, probably for the sake of convenience, all have been categorised either white or black. The trees bearing white fruits are called white mulberry and those bearing black fruits, are called black mulberry or *Morus nigra*. Both types bear edible fruits of varying size and varying quality, some of the fruit, especially borne by the white fruited types are so delicious that these are considered as a delicacy. There are several forms of mulberry classified under one botanical name, *Morus alba*, each varying in morphological characters, fruit quality as well as their climatic requirement.

In India as well as in China, the most important use of mulberry trees is to feed the leaves to the silkworms. The fruit is eaten. Tender leaves of *toot* are also cooked as a vegetable in villages.

Toot plant:

A middle sized monoecious tree with fairly cylindrical bole, upto 3 m high, and 1.8 m in girth; bark dark greyish brown with vertical fissures.

Leaves acute, often cordate, 5–8 cm, stalk 1.2 to 2.5 cm.

Flowers inconspicuous, greenish; male catkins lax flowered, broadly cylindrical or ovoid; female catkins ovoid, pedunculate.

Fruit a syncarp, consisting of many drupes enclosed in fleshy perianth, ovoid or sub-globose, upto 5.0 cm long, white or pinkish white, sweet.

Edible uses:

Fruits of *chimmu* are fondly eaten by all. However, many may not be aware that the tender leaves of this plant are also cooked and eaten as a vegetable. Of course, this usage is uncommon and mostly during the times of scarcity. Besides, *pakodas* (पकौड़ा) and *kachru* (कचरू) or *bhalle* (भल्ले) are also made from them.

Kachru from chimmu leaves:

Ingredients:

Young leaves chopped, 1kg; *besan* (black gram flour) or corn

flour, ½ kg; fresh coriander leaves (chopped), 1 cup; caraway, ½ tablespoon; green chillies, 3-5; turmeric powder, ½ tablespoon; chopped medium sized onions, 2-3 and salt according to taste.

Method:

Make a paste of chopped leaves, *besan* or corn flour and spices listed above. Heat some oil on a flat pan. Put some paste over a pan, spread it like a *chapatti*, Cook from both sides for 15 to 20 minutes. *Kachru* will be ready to serve.

Other uses:

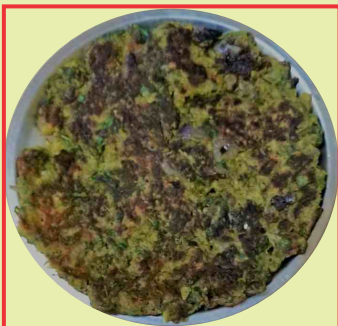
Chimmu leaves are fed to silk worms. These are also fed to cattle, especially milch cattle and are said to improve the yield of milk. The leaves are rich in minerals and also a good source of vitamin C. Wood is used for making small items of furniture and farm tools.



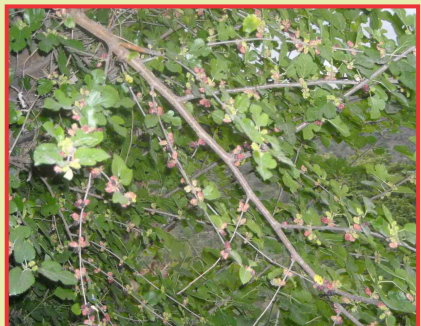
A tree of chimmu



Tender leaves of chimmu which are cooked



A kachroo made from tender leaves of chimmu



Fruits bearing in chimmu

Nasturtium officinale

Family: Cruciferae

English name: Water cress

Local name: Chhooch (छूछ)

Chhooch grows wild in ditches, pools and margins of shallow streams up to an elevation of 2100 metres. It is prepared as a vegetable. It is collected from the wild and is not offered for sale. Therefore, it is not available everywhere and not known to many.

Local people would find it hard to believe that this plant is not native to India but has come from Europe, which is why it has an English name too. People in Europe and America cultivate it and use it as salad and garnish for various dishes. Chopped leaves are incorporated in fruit and vegetable juice cocktails, soups and even in biscuits.

Chhooch plant:

A perennial much branched aquatic herb with creeping or floating stem, glabrous.

Leaves pinnate; leaflets 7-11 mm, sessile, ovate-oblong or sinuately lobed, obtuse.

Flowers white, in short racemes, petals longer than sepals.

Fruit a silique, linear, 12-25 mm long.

Seeds minute, ovoid, muriculate.

Edible uses:

Here in Himachal Pradesh, chhooch stems are picked along with leaves and prepared as saag and eaten along with chapatis. The recipe for this is given below.

Ingredients:

Chopped leaves and tender tips, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; chopped medium sized onions, 2-4; garlic, 4-5 cloves; ginger paste ½ tablespoon; medium sized boiled potatoes, 2-3; salt, according to taste.

Method:

Boil chopped leaves and tender tips till they are soft. Then mash

manually or in a mixer and sauté with hot mustard oil and the spices listed above in sequence. This sautéed saag is then ready to be served. Alternatively, it can also be mixed with 2 or 3 chopped onions or boiled potatoes and cooked for another 5 to 10 minutes before serving.

Other uses:

Chhoochh is reported to possess antiscorbutic and stimulant properties. It is eaten to improve appetite. It is a good source of vitamins and minerals.

Chemical analysis of chhooch shoots gave the following values: moisture, 89.2, protein, 2.9; fat, 0.2; carbohydrates, 5.5; and mineral matter, 2.2 %; calcium, 290; phosphorus, 140 and iron, 4.6 mg/100g (Anonymous, 1966).

Chhooch is also reported to be useful in strangury and goitre. Its juice is used as a cure for polypos of the nose. (Kirtikar and Basu, 1935)



Chhoochh plants growing in a water channel



A bunch of chhoochh plants



Fresh leaves of chhoochh.



Chhooch and potato, a popular vegetable from chhoochh leaves.

Opuntia dillenii

Family: Cactaceae

Synonyms: *Cactus indicus*

Hindi name: *Nagfani* (नागफनी)

English name: Prickly pear

Local name: *Drabhad chhoonh* (द्राभड़ छूंह), *kabuli* (काबुली छूंह).

Drabhad chhoonh is found wild in abundance up to an elevation of 1500 meters. It is a xerophytic plant and thrives best under conditions of drought and erratic rainfall, in poor soils subject to soil erosion. Some botanists like Roxburgh (1832) consider it to be a native of India. It is an invasive plant to some extent. Though mostly wild, but sometimes it is also planted by people on boundaries of fields.

The pads (called cladodes in botanical jargon) of *drabhad chhoonh* are edible and are prepared by people as a vegetable. However, this is not very common and is done only at the time of scarcity.

Drabhad chhoonh plant:

A succulent shrub 1-1.8 m high, stem and branches green, flat and look like leaves.

Leaves modified into spines, aggregating to form prickly areoles.

Flowers complete hermaphrodite, 5-6 cm wide, yellow.

Fruits fleshy, almost berry like, pyriform, 6.1 cm long and 3.1 cm wide, 22 to 27 g, dark red, very mucilaginous, pulp deep purple.

Seeds flat to coma shaped, 4-5 mm in diameter.

Edible uses:

The fruit is edible. It has very fine bristles that might pierce the fingers, so care has to be taken. The bristles can be removed by rubbing the fruit with some wet piece of thick cloth.

The pads are made into vegetable. These can also be eaten raw or tossed in a salad. Only green, immature and tender pads are selected. The bristles and spines are removed, the edges trimmed and the "meat" diced into half-inch squares or simply cut the these into green bean-sized strips, which can then be cooked.

Drabhad chhoonh vegetable:

Ingredients:

Chopped and diced pads, 1 kg; chopped medium sized potatoes,

3-4; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; green coriander leaves (chopped), half a cup; ginger paste, ½ tablespoon; tomato puree, 2 cups; branded garam masala, 1 teaspoon; salt, according to taste.

Method:

Heat mustard oil and add coriander powder, fenugreek powder, red chillies and cumin seeds in sequence. Mix well and then add the paste of onion, garlic, ginger, turmeric powder and tomato puree. Sauté this mixture on slow flame for 5 minutes. Then add chopped pads and potatoes. Mix thoroughly. Cook for 15 to 20 minutes till these become soft. Add garam masala powder and chopped green coriander leaves before serving.

Other uses:

The fruit is edible, however, it is not as good to eat as that of *Opuntia Ficus-Indica* which is cultivated for its fruit in arid countries like Israel. An alcoholic drink is also prepared from the fruits.

The roots of *drabhad chhoonh* are very bitter. These are used to induce quick vomiting in case of persons bitten by poisonous snakes.



Plants of drabhad chhoonh



Tender pads of drabhad chhoonh



Drabhad chhoonh pads chopped and cut for cooking



Finished vegetable of drabhad chhoonh ready to serve

Phytolacca acinosa

Family: *Phytolaccaceae*

English name: Himalayan pokeberry, Indian pokeberry

Local name: *Jharka* (झरका)

Jharka grows wild in Himachal between 1500 to 2500 metres above sea level. It reportedly also grows in Kashmir and South West China. A summer season annual, flowering from June to September, its leaves and tender terminals are edible and cooked as leafy vegetable.

In some of the books on Indian plants, *Phytolacca acinosa*, is reported to grow in places that have a very wide climatic range, even at an elevation of 500 m. There seems to be some confusion in identification of this species as *Phytolacca acinosa* we are describe here is a plant of the temperate regions and is rarely seen growing below 1800 m.

The raw leaves of *jharka* taste bitter and therefore cannot be eaten. Although cattle eat it, it is not fed to milch cattle. Villagers who keep milch cattle say that if cows or buffaloes eat *jharka* plants, the milk turns bitter and unfit for use. Even the *paneer* (Indian cottage cheese) made from this milk, also develops a bitter taste. Upon cooking, the bitter component of the leaves disappears and tastes normal like other pot herbs.

Jharka plant

A herbaceous plant, growing up to 1-1.5 m.

Leaves large, lanceolate, 15-25 cm, long-pointed, and narrowed at the base to a short stalk.

Flowers green white, borne in erect cylindrical clusters, opposite the leaves; spikes are 5-15 cm long; flowers are 7 mm across, with 5 obovate, spreading petals; stamens, 8-10; carpels, fleshy, dark purple.

Fruits are crowded and borne on erect cylindrical clusters, purple at maturity.

Seeds kidney shaped, blue black.

Edible uses:

Leaves and tender twigs of *jharka* are prepared as *saag*.

Saag:

Ingredients:

Chopped leaves and tender twigs, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; medium sized chopped onions, 3-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon and salt, according to taste.

Method:

Chopped leaves and tender twigs are boiled till they become soft. These are then mashed manually or in a mixer and sautéed with hot mustard oil and the spices listed above are added in sequence. This sautéed saag is then ready to be served as such or can be mixed with 2 or 3 chopped onions before serving.

Other uses:

Local people use *jharka* plant to get relief from body pain. Pharmacologically, the plant is accredited with anti-asthmatic, antifungal, expectorant, antibacterial and laxative properties. In China, the roots of this plant are also reported to be eaten. However, in North India, only the leaves and tender twigs are eaten and those too after boiling. (Kirtikar and Basu, 1935).



A plant of jharka



Flowers of jharka

Pteridium aquilinum

Family: Polypodiaceae

Synonym: *Pteris aquiline*

Local name: *Lingdu* (लिंगडू)

Lingdu is a fern growing along the streams, water channels and other moist shady locations in forests as well as farms at elevations ranging from 1450 to 1850 m. It is used as a vegetable, which is a popular seasonal delicacy of this region. Only tender fronds of this plant that starts emerging from mid-April are suitable for cooking. It's season continues for about ten weeks.

According to various books on economic plants, this fern occurs in many parts of the world. Even in India, it is reported to be common. But it is not so. This plant, called *lingdoo* in local dialect, does not grow everywhere, even in Himachal Pradesh, it occurs in a special climatic zone falling between 1450 to 1850 m.

Lingdu plant:

Terrestrial herb with erect rhizome, 5-10 x 2-4 cm; scales 5-7 x 1-1.2 mm, lanceolate, acuminate, entire or rarely fimbriate, dark brown, membranous.

Fronds 1.5-2 x 0.6-0.8 m, bipinnate; stipe 0.8-1 m long, polished above, grooved; lamina rhomboid in outline, rachis grooved; pinnae 22-30 x 10-15 cm, elliptic-lanceolate, acuminate in outline, pinnae towards distal part lanceolate-acuminate, lobed to serrate; costa grooved above, raised below; pinnules 5-8 x 1-2 cm, lanceolate, acuminate, lobed to serrate, lobes oblong, retuse, serrulate, base of pinnules truncate, basal pinnules stipitate, upper sessile, progressively reduced towards apex, terminal pinnae exceptionally larger; costules grooved above, raised below, veins pinnate, indistinct above, raised below, anastomosing.

Sori 3.5 mm long, dark brown, linear, along veins, indusia brownish.

Sporangial capsule 312.5 x 250 μ m, subglobose, stalk 375 μ m long.

Spores 37.5 x 30 μ m, yellowish, ellipsoid, monolete, granulose.

Edible use:

The fronds are made into a vegetable which is eaten along with chapatis or rice during the main course. *Lingdu* vegetable has a characteristic pleasant flavour which is liked by people.

Lingdu vegetable:

Ingredients:

Lingdu fronds, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, ½ tablespoon; fenugreek powder, 1 teaspoon; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 2-4; medium sized chopped onion, 1; chopped garlic cloves, 4-5; salt according to taste; curd, 4 cups; chopped green coriander leaves, 1 tablespoon; garam masala, ½ tablespoon.

Method:

The fronds are cut into pieces and boiled. These are then stir fried after adding salt and spices in the sequence as listed above. The vegetable is now ready to be eaten with *chapatis*.

If it is to be eaten with rice, then add curd and cook for another 10 to 15 minutes. Garnish it with chopped coriander leaves and *garam masala*, and serve with rice.

Food value:

Lingdu fronds, both fresh as well as boiled, are said to have antioxidative activities higher than alpha tocopherol. These are low in beta-carotene, medium in Vitamin E, and low in riboflavin, ascorbic acid, calcium and iron. The protein content is 3.2 per cent pp (Anonymous, 1969).

A decoction of *lingdu* leaves is used as a tonic for women after child birth. This plant is used in many traditional medicines too. (Kirtikar and Basu, 1935).

Lingdu as a source of income:

Tender fronds of *lingdu* are collected by villagers from the forest and made into small bunches and sold in nearby towns for anywhere up to 150 rupees a kg.



Lingdu plants for sale



A plant of lingdu

Reinwardtia indica

Family: Linaceae

Synonyms: *Linum trigynum*, *Reinwardtia trigyna*

English name: Yellow flax

Local Name: *Peenyan* (पीयां)

Peenyan plant is more famous as a flowering shrub than as a food yielding plant. It bears beautiful rich flowers during winter and is also known by several other names of which *piyoli* and *basant* are more common in Himachal and the neighbouring states. This beautiful winter bloomer is common in forests, mountain slopes, thickets often in calcareous habitat ascending to 1800 m. *Peenyan* is basically a shade loving plant but it can grow under bright sunlight too. In gardens, it can grow under trees or in mixed garden beds. Plenty of water and a rich soil are required for its luxuriant growth.

Peenyan Plant:

Tufted undershrub, about 1 m tall; branches erect and prostrate; branchlets angled or terete, glabrous.

Leaves simple, alternate, spiral; petioles ca. 2-3 cm long, somewhat sheathing at base; lamina ca. 2.5-12 x 2-3.5 cm, usually elliptic-obovate or narrowly oblong-lanceolate, decurrent into a short petiole at base, acute or rounded and mucronate at apex, glabrous; secondary nerves 5-9 pairs.

Inflorescences in terminal cymes solitary or in axillary ca. 4.5 cm long; flowers ca. 2.5 cm across, yellow, scented; pedicels ca. 2 cm long, sparsely pilose, bracteate and bracteolate; sepals ca. 0.5-1 cm long, ovate to lanceolate, acute, 3-5 parallel veined; petals ca. 1-3.5 cm long, bright golden yellow, broadly ovate to obovate, abruptly narrowed at base; stamens 5 alternating with 5 staminodes ca. 0.5-3 cm long; filaments dilated and connate at base with 2-3 glands adnate to the base; anthers basifixed; ovary ovoid-triangular; styles 5, free or connate at base; stigmas of long styles larger than those of short ones.

Capsules globose, shorter than sepals, dehiscent into 6-8 cocci.

Seeds one, thin, reniform, compressed.

Edible Uses:

The yellow flowers of *peenyan* are eaten. *Kachru* or *bhalle*, rated as a seasonal delicacy, are prepared in villages from these flowers.

Kachru from *peenyan* flowers:

Ingredients:

Fresh flowers, 1 kg; *besan* (black gram flour) or corn flour, ½ kg; fresh coriander leaves (chopped), 1 cup; caraway seeds, ½ table spoon; green chillies, 3-5; turmeric powder, ½ table spoon; chopped medium sized onions, 2-3 and salt according to taste.

Method:

Make a paste of fresh flowers, *besan* and spices listed above. Heat some oil on a flat pan. Place this paste over the pan, spread it like a chapatti and cook on both sides for 15 to 20 minutes. *Kachru* is ready to be served. Repeat this for the rest of the paste.

Other uses:

Peenyan is grown in gardens as an ornamental plant for its rich yellow flowers. Branches and leaves are used in medicine in the treatment of paralysis. In villages, crushed leaves and stems are applied to wounds infested with maggots. Leaves are chewed to clean the tongue and decoction of leaves is used for gargles.

A yellow dye is obtained from flowers which are used for dyeing clothes and making paints.

Peenyan in folk lore:

Peenyan is called *piyoli* in some parts of Uttarakhand and Nepal and an associated folk lore about the origin of this plant. According to the story, *Piyoli* was a beautiful forest maiden who used to live in the forests of Himalayas. She was raised and brought up by the plants, animals and birds of the forest. One day a prince came to hunt in the forest. He lost his way and came upon *Piyoli*. Overwhelmed by her beauty and charm, the hunter forgot his prey and immediately

proposed marriage to her. *Piyoli* was a nature loving person, so she was reluctant to leave her home in the mountains. But the prince persuaded her with gifts and promise of a comfortable, luxurious life in his palace in the plains. She soon grew to love him and their wedding was celebrated with lavish ceremonies and feast. But *Piyoli* missed her forest friends so much that she fell ill and died. The prince buried her in her beloved forest, where after sometime, this plant with cheerful yellow flowers grew. These flowers are called *piyoli* in her memory.



A shrub of peenyan.



A flower of peenyan



Kachroo made from peenyan flowers.



Ingredients for peenyan kachroo

Rhododendron arboretum

Family: Ericaceae

English name: Rhododendron

Synonyms: *Rhododendron arboretum* var. *arboretum*; *Rhododendron puniceum*, *Rhododendron windsorii*

Local names: *Buraans* (बुरांस), *Braah*, *Buras*, *Bras* or *Barah ke phool*.

Burans is an evergreen tree that grows in the temperate forests of Himachal Pradesh between an altitude of 2300 to 3500 metres. It bears very attractive bright red flowers, which are edible, and flower from March to May. Sometimes, if there is a drought during this period, a second bloom of shorter intensity may also appear during July or August, although this is uncommon.

Burans grow all over India. It is the national flower of Nepal and has been declared the state tree of Uttarakhand. Its name, *Rhododendron* has been derived from Greek word *rhodo* which means rose and *dendron* meaning tree. Considering the beauty and utility of *Rhododendron* flower, a postal stamp was also issued by the Indian Postal Department. The honour of being the tallest *burans* tree, measuring 108 feet, in the Guinness Book of Records, is held by a tree growing in Nagaland.

Burans plant:

Burans is a much branched evergreen tree, growing upto 14 m high and having girth upto 4-5 m.

Leaves are oblong lanceolate, 6-12 cm long, 2.5 to 4 cm wide; upper surface glabrous, lower silvery-scaly.

Flowers very showy, in dense, globose cymes, corolla tube spotted; bell-shaped and are held in trusses of 15 to 20 flowers; colour of the flowers varies considerably, from white to shades of pink or red; some of the white and pink forms sometimes having deeper coloured spots which add to their interest and beauty; nectar pouches at the base of the flower; blood-red forms generally considered to be the most tender.

Fruit a capsule, oblong and curved.

Seeds are minute, compressed and oblong.

Trees of *burans* usually grow on shady slopes in the forests.

Edible uses:

Burans flowers are edible and are used in many ways by the people. These are also used commercially for preparing a squash from its juice and has a soothing and cooling effect during summer months. It is bought in bulk by tourists visiting Himachal Pradesh and Uttarakhand.

As the flowers taste sour, a chutney is also made from them. These are also made into *Kachru* and *pakor*as.

Burans chutney:

Ingredients:

Fresh or dry *Burans* flowers petals, 250 g; fresh mint (*poodina*) leaves, 150 gm; *anardana*, 100gm; red chillies, 5-8; medium sized chopped onions, 1-2; sugar, 1 teaspoon; salt, according to taste.

Method:

Chutney is normally prepared from fresh flower petals known as *barah ki chutney* in local dialect, but can also be prepared from dried flower petals during off-season. For preparing chutney, grind all the ingredients in a mixer except sugar and salt. Transfer this mixture to a deep container and add salt and sugar. Now *barah ki chutney* is ready to be served.

Buraans kachru:

Ingredients:

Besan (black gram powder) or *corn flour*, ½ kg; fresh coriander leaves (chopped), 1 cup; *ajwain*, ½ table spoon; green chillies, 3-5; turmeric powder, ½ table spoon; chopped onions, 2-3 and salt according to taste.

Method:

Make a paste of flower petals, *besan* or *corn flour* and spices. Heat some oil on a heating pan. Put this paste over the pan and cook for 15 to 20 minutes. *Kachru* is ready.

Juice:

Burans juice, also prepared from flowers, is a common and pleasant drink served as sherbet in various local functions or festivals. Juice is either extracted with the common household juice extractor

used for citrus fruits or by boiling flowers. This juice is taken orally as a blood purifier and to check nose bleeding.

Commercial fruit canning units prepare squash from this juice. It is sold in large quantities in Himachal Pradesh and Uttarakhand.

Food Value:

One hundred grams of fresh flowers of *burans* contain, moisture, 82.2%; protein, 1.6%; fats, 0.6%; carbohydrates, 1.7%; minerals, 1.3%; fibre, 1.3%; energy, 40 kcal; phosphorus 2.5 mg. (Kapoor *et al.*, 2010)

Other uses:

Burans tree has other uses also. It occupies a special place in the cultural and economic life of the people of Himachal Pradesh. The flowers are offered in temples and religious places and used for decoration. They are also offered during worship on *sankranti* (संक्रांति) of *Hindu* calendar.

The petals are dried and ground into a powder to be stored for future use. This powder is used as a sniff to treat nose bleeding and is said to be a very effective cure against frequent nose bleeding.

The wood is used to make tool handles, boxes, posts and furniture. It is termite safe. Leaves are poisonous when young and applied to forehead for headache. Extract of leaves, stem and bark is useful to get rid of rats. Tree is also exploited for fodder and fuel.

Burans as a source of income:

Burans flower is a good source of income and livelihood option for poor people. Children collect flowers from forest and prepare bouquets of flowers with 10 to 15 flower sticks and sell these bouquets to visiting tourists by roadside. The bouquets are bought for 20 to 50 rupees each by tourists. Some people extract juice from the flowers with simple hand operated juice extractor that easily sells at the rate of 100 rupees per bottle.

There is also demand for dried flowers. These sell for 400 to 500 rupees a kg.

Burans facing danger of extinction:

Because there is no regulation on harvesting *burans* flowers from the State Forest Department, the flowers are ruthlessly collected

by cutting the branches that causes injury to the tree. This also affects natural regeneration due to the lack of flowers. Since, no new trees are being added; the natural population is declining every year. This needs to be checked otherwise this tree may not be seen after a few decades.



A burans tree in full bloom



Flowers of burans



Burans flowers being sold at Mandi town.



Kachru made from burans flowers



Squash made from burans flowers

Rumex hastatus

Family: Polygonaceae

Synonyms: *Rumex dissectus*

Local name: *Khat malori* (खट मलोरी)

Khat malori is a perennial herb found growing in Himachal Pradesh up to an elevation of 2300 meters above the sea level. It is a hardy plant and can grow even on poorest soils and from the crevices of stone retaining walls on mountain roads. The leaves of this plant contain oxalic acid which imparts a pleasant sour taste to it.

Khat maloree leaves are cooked and made into a *saag*. Due to their pleasant sour taste, the leaves serve as an ingredient of chutney and pickles. It is said that *khat malori saag* should not be eaten in large amounts since the oxalic acid can lock-up other nutrients in the food, especially calcium, thus causing mineral deficiencies. However, it is good if consumed in smaller quantities.

***Khat malori* plant:**

A bushy shrub or undershrub, 30-90 cm high mostly occurring on dry rocks and hillocks; branches numerous, slender erect.

Leaves stalked, entire, broadly triangular, long pointed, 2.5-6 x 2-5 cm or hastately 3-lobed, the lobes narrow or almost linear.

Flowers polygamous, in small whorls racemed and forming panicles, pink or green tinged with pink, fruiting sepals orbicular, pink, not fringed, notched at both ends.

Nut small, trigonous.

Edible uses:

In Kamand area, *khat malori* is eaten raw or cooked as a leafy vegetable for which young leaves and tender terminals are most suitable. Most common preparation from *khat malori* is *saag* prepared by following the given recipe,.

***Khat malori saag*:**

Ingredients:

Chopped leaves and tender tips, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 tablespoon; red chillies, 2-3; chopped medium sized onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; boiled potatoes and salt, according to taste.

Method:

Boil chopped leaves and tender tips till they are soft. Then mash manually or in a mixer. Sauté with hot mustard oil and the spices listed above in sequence. This sautéed *saag* is then ready and can be served as such or can be mixed with 2 or 3 chopped onions or boiled potatoes and cooked for another 5 to 10 minutes before serving.

Other uses:

Livestock graze on the plant, but it is not very nutritious and is toxic in large amounts because of oxalates.

Fresh or dried leaves are astringent, diuretic, laxative and refrigerant. They are used to make a cooling drink in the treatment of fevers and are especially useful in the treatment of scurvy. The leaf juice, mixed with fumitory, has been used as a cure for itchy skin and ringworm. An infusion of the root is astringent, diuretic and haemostatic. It has been used in the treatment of jaundice, gravel and kidney stones. Both the roots and the seeds have been used to stem haemorrhages. A paste of the root is applied to set dislocated bones. The plant is depurative and stomachic. A homeopathic remedy is made from the plant to treat spasms and skin ailments. (Bown, 1995)

Seeds are considered as an anthelmintic and in powdered form used to cure eye diseases, vision problems and eyesight weakness.

The whole plant, used in the fresh state, is diaphoretic, diuretic and refrigerant.

A tea made from the leaves is used in the treatment of fevers, inflammation and scurvy.

The leaf juice is useful in the treatment of urinary and kidney diseases.

A tea made from the roots is astringent and is used in the treatment of diarrhea and excessive menstrual bleeding. (Bown, 1995).



A plant of *khat malori*



Leaves of *khat malori* collected for cooking.



Kachroo made from *khat malori* leaves

Senna occidentalis

Family: Fabaceae

Synonyms: *Cassia caroliniana*, *Cassia ciliate*, *Cassia laevigata*, *Cassia occidentalis*

English name: Coffee senna, coffee weed.

Local name: **Badi yelo** (बड़ी येलो) is an annual under shrub or a short lived perennial. It can be seen growing up to an altitude of 1500 metres. It is a weed of roadsides, waste areas, disturbed sites, pastures, grasslands and open woodlands. The plant is sometimes gathered from the wild for food or local medicinal use. The seeds are dried, roasted then ground into a powder and used as a coffee substitute. The plant is also sometimes cultivated for medicinal purpose

Badi yelo plant:

Badi yelo plant is a smooth annual that can grow up to 2 m.

Leaves compound, leaflets, in 4-6 pairs, have a sharp tip; 2-9 cm long and 2-3 cm wide with a distinct gland 3-5 mm from the base of the stalk.

Flowers are axillary, in short racemes; sepals green, 6-9 mm long; petals, yellow, 1-2 cm long.; stamens 6-7, of two different lengths.

Seed pods are dark brown, 8 to 12 cm long, 7-10 mm wide glabrous and recurved.

Seeds are dull brown, 4-5 mm long and flattened on both ends, compressed, hard, smooth and shining.

Edible uses:

Young immature pods when the seeds are soft, along with leaves are made into a vegetable.

Vegetable:

Ingredients:

Chopped pods and young leaves, 1 kg; medium sized potatoes, 1-2; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 tea spoon; turmeric powder, 1 tablespoon; red chillies, 2-3; chopped medium sized onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; chopped medium sized tomato, 1-2; garam masala powder, 1 teaspoon; salt, according to taste.

Method:

Sauté chopped pods and young leaves alone or along with chopped potato in hot mustard oil with spices listed above in the same sequence. Cook for 20 to 25 minutes till pods and potatoes become soft. Add garam masala and mix thoroughly. Serve with *chapatis*.

Badi yelo is reported to be used as condiments and in perfumery. The seeds are dried, roasted and then ground into a powder that is used as a coffee substitute.

Other uses:

Badi yelo plant is also used as an ornamental plant in gardens, though it is also invasive.

Tender plant parts are used as green manure. The plants can also be fed to cattle but only till pre flowering stage as the seeds are poisonous for cattle. (Anonymous, 1972)

All parts of *badi yelo* plant are said to possess almost similar tonic, diuretic, stomachic and febrifuge properties and are especially used for dropsy, rheumatism, fevers and venereal diseases. The plant is also used to cure sore eyes, haematuria, rheumatism, typhoid, asthma and disorders of haemoglobin, and is also reported to cure leprosy. A decoction of the plant is used in hysteria, in dysentery and other stomach troubles, as well as applied to sores, itch and inflammation of the rectum (Kirtikar and Basu, 1935).

The seed is bitter and considered to be a blood tonic and excellent diuretic. Seeds are useful in cough, whooping cough, convulsions and in heart diseases. (Kirtikar and Basu, 1935)



Pods of badi yelo



Vegetable made from badi yelo pods



A plant of badi yelo



Collecting badi yelo pods from a plant

Senna tora

Family: Fabaceae

Synonyms; *Cassia numilis*, *Cassia obtusifolia*, *Cassia gallinaria*, *Senna tora*

English name: Sickle enna, sickle pod, tora, coffee tora.

Local name: Yelo (येलो)

Yelo is an annual under shrub found commonly growing in wastelands throughout the mid-hill regions and is considered to be an annual weed of the rainy season. *Yelo* plant is stress tolerant and therefore can grow even in very poor soils. Although it emerges in the rainy season, it flowers from October after the rainy season gets over.

Yelo grows on dry soils. It can be seen growing on a very wide climatic range from the sea level up to 1550 meters. Both plant as well as seeds of *yelo* are edible. Young leaves and leaf pods are cooked as a vegetable. Roasted seeds of *yelo* are used as coffee. In North India, ground roasted seeds are made into chutney. One very interesting feature of this plant is that its seeds can retain their viability for 25 years.

Yelo Plant:

A foetid, annual herb or undershrub, up to 30-90 cm in height, found as a weed throughout India, ascending up to an altitude of 1,550 m in the Himalayas.

Leaves are pinnate, 6.0-12.5 cm long; leaflets, 3 pairs, 3-5 cm long, membranous, ovate- oblong, with glands in last two pairs, showing sleeping movements.

Flowers are bright yellow, usually in pairs on very short axillary peduncles, bearded in the axil of leaves, petals 5, each about 1.25 cm wide.

Pods stout, 15-20cm long,

Seeds green, 26-30

Edible uses:

Yelo chutney, made from dry roasted seeds is one popular recipe in Himachal Pradesh and the adjoining hilly areas. Young leaves and green pods are also used to prepare a leafy vegetable in the same way as from *badi yelo* (*Senna occidentalis*).

Yelo ki chutney:

Ingredients:

Dry *yelo* seeds, 1 kg; galgal (hill lemon) juice, 500 ml; jaggery, 250 gm; dates, 150 gm; mustard oil, 3-4 tablespoons; fenugreek seeds, 3 tablespoons; cumin seeds, 1 tablespoon; turmeric powder, 1 tablespoon; red chillies, 10-12 and salt, according to taste.

Method:

Dried seeds are roasted and ground into a powder. This powder is sautéed in hot mustard oil for 2 minutes along with turmeric powder. Then boiled with *galgal* juice, jaggery and dates for 20 to 30 minutes. Salt is added next. It is then kept aside to cool. Spices like fenugreek seeds, cumin seed and red chillies are roasted in a hot pan and ground into powder. This powder is added to the yelo seed mixture and mixed well. It is kept aside for two weeks after which the chutney gets ready. This chutney has a long shelf life of 2-3 years.

Other Uses:

Yelo has many uses. The roots, leaves, and seeds have been widely used in traditional medicine. Seeds taste bitter and somewhat salty but help to boost eyesight. It is also consumed to reduce excess of heat or intensive heat from the liver. It helps to cool down intestines and makes the bowel movement flexible. It is also applied for weight reduction purpose. The seed can be given to livestock as a protein rich food.



A plant of yelo



Yelo seeds



Vegetable made from tender leaves and pods of yelo.



Chutney made from yelo seeds

Stellaria media

Family: Caryophyllaceae

Synonyms: *Alsine media*

English name: Chikweed

Local name: *Padyaala* (पडयाला)

Padyaala grows as a weed, especially in shady and damp areas up to an elevation of 4000 m in Himachal Pradesh. It grows as weed in many other parts of India too. In fact the species *Stellaria media* is reported to be a native of Europe and growing all over the world. Some botanists are of the view that it has three subspecies. But *padyaala* is so naturalized here that it looks to be a local plant. (Anonymous, 1976)

The leaves and stalks of this plant are cooked and eaten as vegetable. These are usually mixed with leaves of other leafy vegetables while being prepared as *saag*. It is also said to be eaten raw in salad at some places.

***Padyala* plant:**

Padyala is a weakly tufted herb upto 15-60 cm tall; glabrous or pubescent; stems are nearly erect or procumbent, a line of hairs running down between the joints, much branched.

Leaves ovate acute, 2.5 to 5 cm, usually cordate, lower ones stalked, upper sessile, often narrower.

Flowers are solitary or in few-flowered, terminal, leafy cymes, white; pedicels nearly capillary, ascending, reflexed or recurved, frequently pubescent; sepals five, lanceolate-oblong, 3.5 to 6 mm long, blunt to acute, usually with long soft hairs; petals five, deeply cleft, white, small, shorter than sepals, two-parted or absent; stamens three to five, rarely more; single pistil with three or four styles.

Fruit is a many seeded dry capsule, ovoid, usually a little longer than the sepals, opening by six teeth, breaking into five segments at maturity.

Seeds are dark brown, yellowish or dull reddish-brown, nearly circular, slightly elongated toward the notch at the scar, about 1 mm across, the surface covered with conspicuous curved rows of irregular wart-like projections, marginal projections are more prominent and toothed in appearance.

Edible uses:

Padyaala is used as a pot herb. Tender terminals along with leaves and flower are used for *saag* preparation. It is believed in villages that *padyaala* has a cooling effect on the body. Therefore, to neutralize this

effect, leaves of other pot herbs, especially from the genus *Brassica*, are mixed with *padyala*.

Padyala saag:

Ingredients:

Chopped tender tips of Padyala, a few other locally grown pot herbs from the genus *Brassica* and spinach, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1 teaspoon; turmeric powder, 1 teaspoon; red chillies, 2-3; medium sized chopped onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; and salt according to taste.

Method:

Boil the chopped tender tips till these are soft. Then mash manually or in an electric blender. Then sauté with hot mustard oil and the spices listed above in sequence. This sautéed sag is then ready to be served.

Food value:

Analysis of *Stellaria media* leaves revealed that these contain, moisture, 91.7; protein, 1.2, crude fibre, 1.7 and total minerals 1.6 g per 100 gm.

Padyala is said to be a good source of Vitamin A and C. (Anonymous, 1976)

Other uses:

Padayla grows as a weed in cultivated fields, damp places or shady localities. It is fed to cattle too.

This plant is said to be very useful in inflammations of the digestive, renal, respiratory and reproductive tracts. It has a strengthening and soothing action on mucus and dermoid surfaces and as such can be applied direct, if required. It is also useful in severe inflammations of skin, such as erysipelas, scalds and burns, ulcers in legs and thigh region, haemorrhoids, eczema and inflammations of eyes (Kirtikar and Basu, 1935).



Plants of padyala



Padyala leaves and shoots collected for cooking.



Saag made from padyala.

Thermopsis spp.

Family: *Fabaceae*

Local name: *Kujjee* - (कुज्जी)

Kujjee is a seasonal shrub and its plants grow during summer season at around 1800 metres above the sea level. The precise botanical identification of this plant could not be made. We also could not find the description of this particular plant in any of the books on Himalayan plants. It is quite likely that *kujjee* has escaped the attention of botanists. However, as the flowers are quite similar to those of *Thermopsis barbata*, it is quite likely to be some species of *Thermopsis*. *Thermopsis barbata* grows at a higher level where *kujjee* does not grow.

Kujjee bears very attractive and pleasant smelling flowers during the months of May-July. Since, the plants grow together in large numbers, these get very easily noticed because of their attractive purple flowers on mountain slopes. So, this plant has been noticed and appreciated mostly by trekkers who are usually outsiders. Local people, especially the shepherds who travel for months together with their flocks, dig out the tubers, clean and wash these and then prepare a vegetable. Sometimes, tubers are just roasted on burning fire and eaten. Thus, it also serves as a very good emergency food.

Kujjee plant:

Seasonal herbs, appearing in April-May and drying in September-October; tubers 1.0 - 1.5 cm wide and 8-15 cm long.

Shoots prostate, growing up to 30 cm, glabrous.

Flowers deep purple, very attractive and fragrant.

Pods very small, 3 mm wide 10-15 mm long.

Edible uses:

Tubers are edible and fondly eaten by villagers. These are cleaned, peeled, boiled and prepared like a vegetable. These tubers are also roasted in fire. The skin is then peeled off and is eaten with salt. These taste somewhat like potatoes

Vegetable of kujjee tubers:

Ingredients:

Kujjee tubers, 1 kg; mustard oil, 3-4 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, ½ tablespoon; cumin seeds, 1

teaspoon; turmeric powder, ½ tablespoon; red chillies, 2-3; medium sized chopped onions, 2-4; garlic, 4-5 cloves; ginger paste, ½ tablespoon; chopped green coriander leaves, 1 cup; and salt according to taste.

Method:

For preparing a vegetable from *kujjee*, the tubers are first boiled and then peeled. Then these are cut into small pieces and fried in hot oil along with the spices listed above in sequence, as is done with potatoes. Garnish with chopped coriander leaves and serve with *chapatis*.



A plant of kujjee



Raw tubers of kujjee



Boiled and peeled kujjee tubers cut into small pieces



Ready to serve kujjee vegetable

Urtica parviflora

Family: *Urticaceae*

English name: Stinging nettle

Local name: *Koogas*, कूगस, बिच्छू बूटी

Koogas is a widespread herbaceous perennial plant growing all over the hills. It is mostly found growing at moist sites along streams, open forests and ditches, on mountain slopes, in woodland clearings, and in disturbed areas such as roadsides and old fields. This plant, when touched, causes itching and has an inflammatory effect on the body, the reason why it is also called “stinging nettle” in English.

There are three plants called by the name *koogas*. They are identified by three different botanical names viz. *Urtica dioica*, *Urtica parviflora* and *Girardiana heterophylla*. As these are related with each other, they are similar in appearance and also cause irritation. *Urtica dioica* grows at lower altitudes, *Urtica parviflora* starts growing above 1700 metres and *Girardiana heterophylla* grows at still higher elevations. But it is *Urtica parviflora* which is eaten. Its leaves and terminal shoots are cooked as vegetable. Contact with this plant also causes irritation, but it is much less than the other two.

People cover their hands with gloves or cloth while collecting the leaves, which lose their stinging property after being soaked in water. The stinging effect completely vanishes after cooking. *Saag* (cooked leaves) of *koogas* is a quite popular in the hills and is a seasonal delicacy.

Koogas plant:

A perennial herb, 25-50 cm tall.

Stems slender, simple or few branched.

Leaves broadly ovate or ovate-cordate, 2.5-8.5 × 2-7 cm, often membranous, 5-veined, lateral basal veins arcuate, reaching middle margin, secondary veins 2-4 each side; base rounded or shallowly cordate, margin doubly dentate, teeth increasing in size distally, apex acuminate.

Inflorescences are unisexual; male inflorescences in distal axils, spicate, 4-7 cm; female ones in proximal axils, subspicate, slender, with a few short branches, or male flowers in middle axils, female flowers in proximal and distal axils, subequal to or shorter than petioles; male

flowers sessile or short pedicellate, in bud about 1.3 mm; perianth lobes connate 1/2 of length, densely hirtellous, then glabrescent; female flowers: perianth lobes connate at base, unequal, dorsal-ventral lobes suborbicular, sparsely setulose, lateral lobes broadly obovate, about 2 times as short as dorsal ones.

Achene yellowish green, broadly ellipsoid-ovoid, slightly compressed, about 1 mm, smooth, invested by persistent perianth lobes.

Edible uses:

Koogas is eaten as a leafy vegetable and its taste is comparable to that of spinach but with a slightly greener and earthier flavour. As older leaves can be laxative, relatively younger leaves and tender terminals are preferred for cooking. Most common preparation from *koogas* is *saag*. Sometimes *chutney* is also prepared from the leaves.

Koogas saag:

Ingredients:

Chopped leaves and tender shoot tips, 1 kg; mustard oil, 2 tablespoons; coriander powder, 1 tablespoon; fenugreek powder, 1/2 table spoon; cumin seeds, 1/4 tablespoon; turmeric powder, 1/4 tablespoon; red chillies, 2-3; chopped onions 2-4; garlic, 4-5 cloves; ginger paste, 1/2 tablespoon; and salt according to taste.

Method:

Boil chopped leaves and tender tips till they are soft. Then mash these manually or in a mixer. Then sauté with hot mustard oil and the spices listed above in sequence. This sautéed *sag* is then ready to be served as such or can be mixed with 2 or 3 chopped onions and cooked again for 5 to 10 minutes before serving.

Koogas chutney:

Ingredients:

Chopped *koogas* leaves, 100 gm; chopped mint leaves, 100 gm; *anardana* or *amchoor*, 50 gm; green chillies, 5-6; coriander leaves, 20 gm; chopped onions, 2-3; ginger paste, 1 table spoon.

Grind all in a mixer and add salt according to taste. The *chutney* is ready to be served.

Other uses:

Koogas plant is used by villagers to treat several ailments. Roots

are employed for the treatment of fractures and dislocations. Leaves and inflorescences are prescribed as tonic and as a cleaning agent after parturition. A decoction of this herb is given in fevers.

The stem of *koogas* plants yield a fibre which is used in making ropes.

Koogas plants are also sometimes fed to cattle.



Koogas plants



A close up of koogas plant



Koogas saag ready to serve.



Koogas chutney

Wild mushrooms

Many types of mushrooms appear in Himachal Pradesh during spring and rainy seasons, especially in forest lands rich in organic matter. Though there are some poisonous types too, many of them are edible and these are collected and eaten by local people.

Only five are most commonly gathered by people. Out of these the following four types are gathered for personal consumption and rarely sold in market. Only *guchchhee* (गुच्छी) *Morchella esculenta*, which has been described earlier, is collected for sale in the market.

These are being briefly described below:

I. *Bhatolian* (भतोलियाँ) - *Termitomyces micrarpus*

These are small sized white mushrooms up to 4 cm long and 1-1.2 cm in diameter, convex applanate to depressed at maturity; cap surface silky white to yellowish white, with occasional acute papillate orange white umbo in the center; scaly, scales appressed fibrillose; finely striate; taste and odour mild. Lamellae free to adnexed to crowded, 0.2 - 0.3 cm broad, white. Stipe central, up to 3 cm long, 0.1 - 0.2 cm broad, whitish without pseudorrhiza, cylindrical, smooth, glabrous, hollow.



Uses

Bhatolian mushrooms arise mostly on termite mounds. They are excellent, mild tasting, whitish mushrooms with typical mushroom flavor and soft texture. Being miniature sized morphologically, these

are gathered in bulk from the termite mounds during the rainy season.

These are normally mixed with rice to prepare rice *pulao*. Besides, being available in sufficient quantity, these can be cooked as vegetable or mixed vegetable and even as mushroom soup.

2. *Gole tatmor* (गोल टटमोर) – *Termitomyces heimii*

This is a medium sized mushroom, up to 31 cm high and 7 cm in diameter.

Cap surface is convex in the beginning and then expanding to appanate with a broad perforatorium; surface silky white; taste and odour mild. Lamellae free, whitish pink, subdistant to crowded, 0.7 cm broad. Stipe central, up to 7 cm long with 26 cm long pseudorrhiza, solid above the ground, subterranean part hollow, light brown squamules present on the above ground portion, pseudorrhiza longitudinally twisted, scabrous below the annulus; veil in the form of persistent double annulus which is attached to upper quarter of the stipe.



3. *Badi chhattri* (बड़ी छतरी) – *Macrolepiota procera*

It often grows abundant in the early monsoon period and is one of the well-known edible mushrooms. It is 6.5 to 9 cm high and 4.6 to 9.5 cm wide.

Cap surface convex, brown to greyish brown (5D3) with olive brown umbo (4E4) covered with greyish brown (5D3) to brownish orange (5C3) appressed fibrillose scales over yellowish white background; margin inflexed, irregular, splitting at maturity; cuticle fully



peeling; flesh creamish white, unchanging, 0.4 – 1.0 cm thick; taste and odour mild. Lamellae free, collariate, close to crowded, unequal, of 3 - 4 lengths, 0.5 - 0.8 cm broad, yellowish white (4A2), ventricose; gill edges smooth. Stipe central, 6.2 - 16 cm long, 0.5 - 0.7 cm broad, 2 cm near the base, yellowish white (4A2), often covered with greyish brown (5D3) scales which breaks up into irregular patches, at some places stipe surface cracked resulting in to banded appearance, more dense towards the base, obclavate; annulate, annulus double, brown layered on the lower side, annulus fibrous, funnel shaped, initially attached, finally movable.

Uses:

This is the most desirable mushroom, well known for its culinary and medicinal properties. It grows during March –April.

4. **Khookh (खुख) - *Schizophyllum commune***

This mushroom is usually found growing on decaying woods. It is greyish to pinkish-yellow shell shaped mushroom that has a wavy lobed pileus margin, splitted gill pattern. This usually grows up to 6 cm in height and 3 cm in diameter.

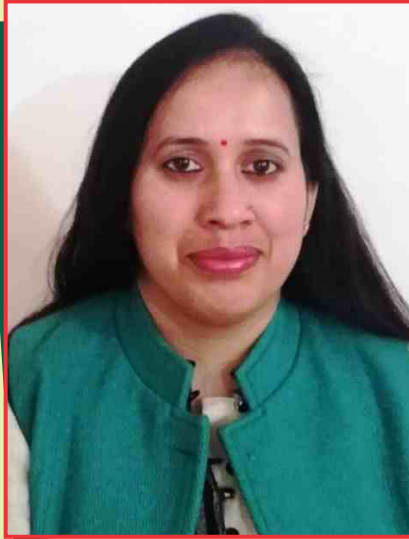


Cap surface is dry, white to greyish, fan shaped to flattened, hairy, margin irregular, splitting, thin usually incurved; flesh up to 2 mm in thickness tough, leathery, pallid, unchanging; gills whitish to greyish; without a stem; split lengthwise, rolling back covering the space between the gills, disdistant unequal, 3 mm broad; spore deposit almost whitish. Taste and odour, mild. Stalk (stipe) usually very small or abesent lateral to slightly eccentric, 3.3 cm long, 0.4 cm broad, flesh tough, leathery, pallid solid, tomentose, veil absent.

Edible uses:

These wild mushrooms are consumed in a variety of ways and recipes differ in different localities. However, the most common and popular method of its consumption is by preparing *pulao*.

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EIPLOGUE

An effort has been made by the authors to inform readers about 35 plants eaten by the local people in the hills of Western Himalayas. Out of these only *Morchella esculenta* is known to outside world. Others, though quite popular with the locals, are hardly known outside the areas of their occurrence. So, the existence and utility of these plants should be publicised.

The plants included in this book are not the only ones used as a source of food in the hills. There are many others too. Studies should be initiated to collect information about all the edible plants.

There exists a lot of confusion about the taxonomical identity of these plants. It appears that botanical names have been assigned without much verification. So the botanical descriptions given in books on floras do not match the actual specimens. It seems that some of these plants have not been studied so far. The authors did not find any description for plants like *taradi* (तरडी) whose tubers are dug up from the forests and sold in towns in large quantities. There are a few more such examples. Correct taxonomical identification of any plant is the first prerequisite if this plant is to be promoted as a new commercial crop. Research work should be initiated in this direction and botanists should collaborate with agriculturists or horticulturists for this. Agriculture or horticulture scientists know these plants only by their local names which also vary from place to place. So they just pick up one name which is most convenient for them. This has created the confusion. Therefore standardization of names is very important for the promotion of any new plant.

Many of these plants have more than one edible use. Some of these e.g., *Diplazium serampurens* or *lingad* (लिंगाड़) is made into a pickle; a beverage is made from *Rhododendron* (बुरान्स) flowers. This is usually done either at household level or in very small scale units. Efforts should be made to refine and standardize the techniques adopted by villagers. Possibilities for further value addition to these should be explored.

These plants are being used by people for food by since ages. But information on their precise nutrient content is not available. If at all any information is available, it is on their medicinal uses given in various books on medicinal plants which does not serve the purpose. Therefore, chemical analysis of not only these but all edible plants should be carried out and their nutrient content should be determined. This can be easily be done by either by assigning this work to some Ph.D. student or taking up this work as an independent short term research project at some university with funding from agencies like Department of Science and Technology, ICAR or CSIR.

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Dr. Chiranjit Parmar

Most research of Dr. Parmar has been on wild growing and lesser known fruits and he is known internationally for his work on Himalayan wild fruits.

Dr. Parmar has written two books, brought out a CD Rom and published hundreds of articles on fruits. For the last thirteen years, he is compiling Fruitipedia, an online encyclopaedia of the edible fruits of the world. At present, Fruitipedia has articles on 554 fruits and it has been viewed by 4.5 million people.

Another notable professional achievement of Dr. Parmar is that he has introduced apple cultivation in Karnataka and adjoining tropical areas on the lines it is done in Indonesia.

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Dr. Tara Devi Sen Thakur is currently working as Assistant Professor of Botany at Sardar Vallabhbhai Patel Cluster University, Mandi. Earlier she worked as Assistant Professor of Botany at Vallabh Government College, Mandi for 10 years and as Facilitator in Mid Himalayan Water-shed Management Project for 3 years. Her main field of research has been ethnobotany and biodiversity conservation.

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Dr. Tara hosted a website **www.himalayanwildfoodplants.com** in April 2019. This website contains articles on 200 wild growing plants eaten by local people, their traditional processing and indigenous uses. All these articles have been written by her. This website has already been viewed by more than 6.50,000 persons from all parts of the world.

Dr.Thakur is also the Principal Investigator of the research project, “Traditional processing of wild edible plants of District Mandi;their economic, medicinal and nutritional potential plus value addition for livelihood promotion by analysing scope for latest processing techniques” funded by the HP State Department of Science and Technology.

Dr.Thakur hosted a YouTube channel having more than 110 videos on plant science.

Dr.Thakur has been actively involved in People's Biodiversity Register of District Mandi of Himachal Pradesh during corona period for that she was honoured on 19th September, 2020 by Sri Virender Kanwar, Rural Development & Panchayati Raj Minister, Himachal Pradesh.

