

Wild Edible Fruits of Himachal Pradesh



Wild Edible Fruits of Himachal Pradesh

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State Centre on Climate Change & UNEP-GEF- MoEFCC Project Himachal Pradesh State Biodiversity Board

Himachal Pradesh Council for Science, Technology & Environment (HIMCOSTE)

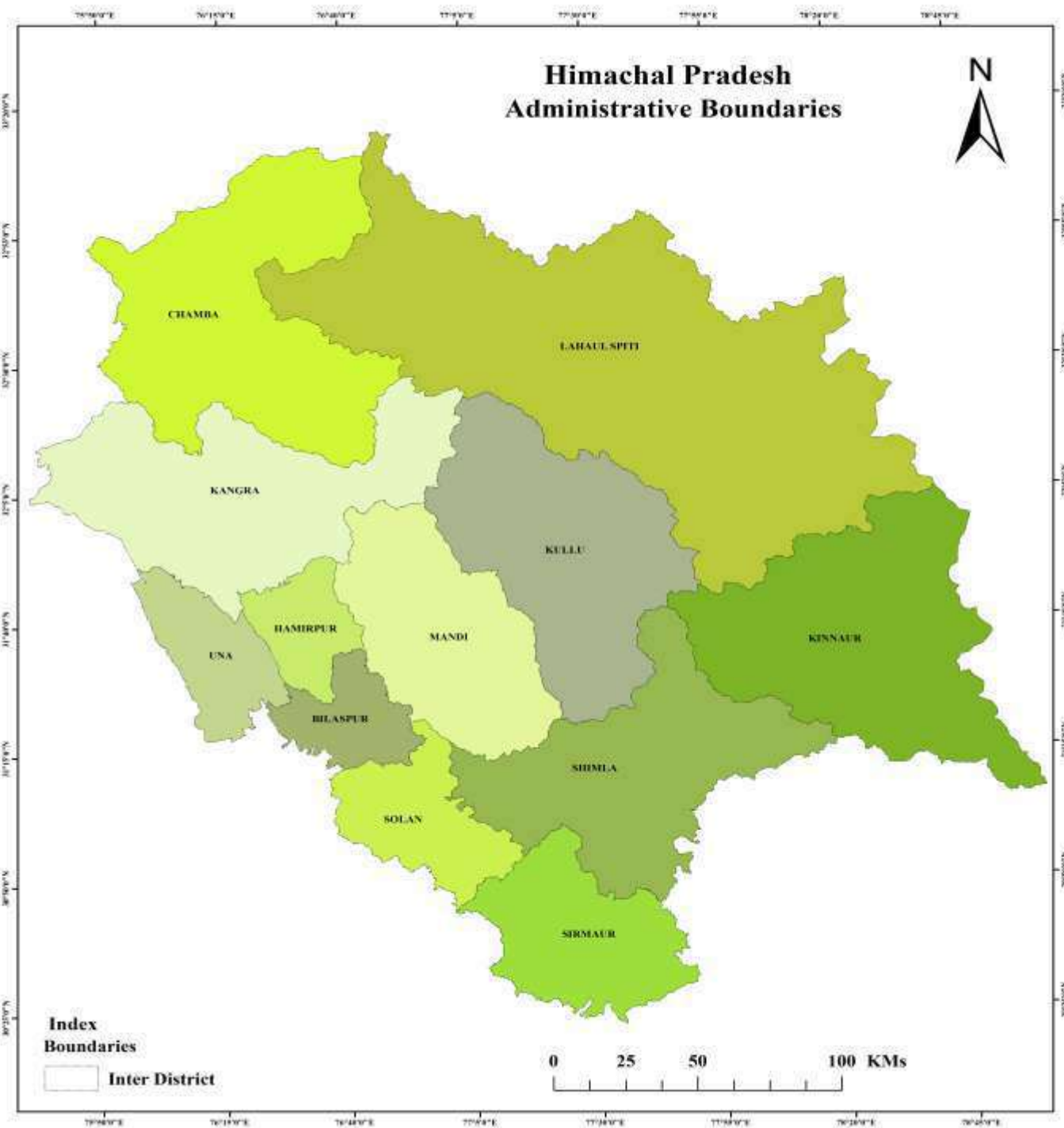
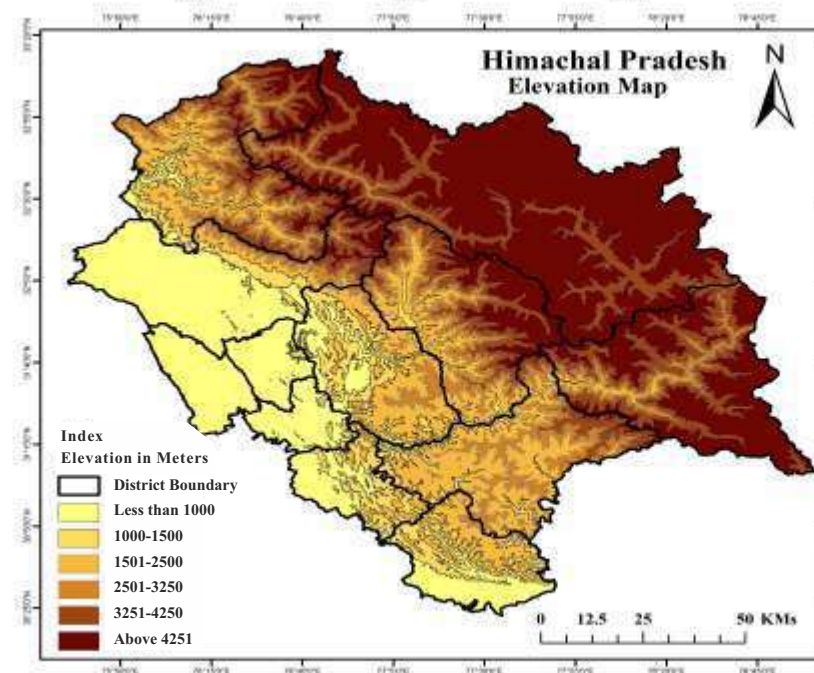
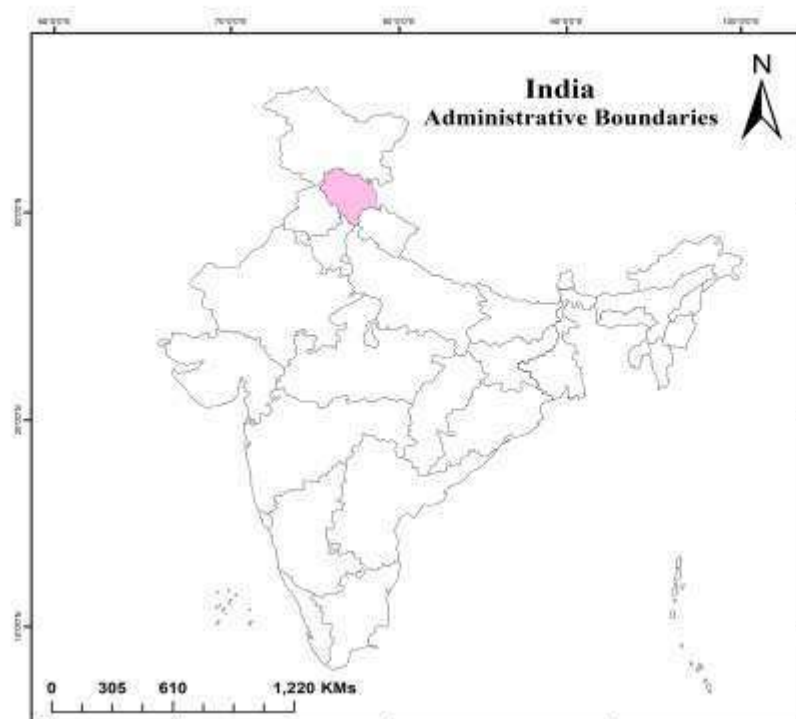
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C h i e f M i n i s t e r

H i m a c h a l P r a d e s h

Message

Himachal Pradesh, a small mountain state in the Northwestern Himalayan region is well known for its richest biological diversity in the world. Many of the plant species found in the state are of rare nature, which makes the floristic richness even more important. Besides having good reserve of floral and faunal diversity, the state is bestowed with very high value medicinal plants and herbs, which play a very significant role in the upliftment of the rural livelihoods.

Wild fruits are also an important and an integral part of the Himalayan biodiversity that provide not only the nutritious food, but also help in enhancing the rural economy in the Himalayan region. Besides providing timber, firewood, fodder, they serve as famine insurance at the times of food scarcity, but these are somehow underutilized. The present attempt of the compilation of information in the form of a Coffee Table Book on the Wild Edible Fruits of Himachal Pradesh would be helpful to have first hand information about the wild fruits available in the State of Himachal Pradesh and their importance. This handy information would further be useful in the identification and evaluation of these underutilized species of Himachal Pradesh for their sustainable use, which can broaden our choice of food and enrich the livelihoods of the rural people of the State. I congratulate the State Centre on Climate Change and HP State Biodiversity Board (HPSBB) of the H.P Council for Science Technology & Environment (HIMCOSTE) for this initiative and wish that we may get the best use of this information.

(Jai Ram Thakur)





*Minister of Health & Family Welfare,
Medical Education, Ayurveda and
Science & Technology, Himachal Pradesh*

Message

The State of Himachal Pradesh is blessed with rich plant as well as animal diversity forming part of the different climatic zones of the Himalayan region. Collection of fruits from wild for food and domesticating food plants for multipurpose use is an age old practice worldwide. Himachal Pradesh also constitutes a good proportion of these wild fruit species which may serve as an alternate source of income to the rural masses.

Wild fruits together with their products can be used to ensure food security during the period of scarcity and their availability round the year supplement food and nutrition and can become the source of income for the local inhabitants. During last few decades, forest has receded away from the villages and have been considerably degraded resulting in very negligible or non availability of many wild fruits. Thus the documentation of the available literature of wild edible fruits is important for their propagation and conservation, so that this neglected resource of the Himalayan region is best utilized for food, nutritional and livelihood security. The present compilation in the form of a Coffee Table Book on the Wild Edible Fruits of Himachal Pradesh provides an insight on these species of the state along with their medicinal values. My good wishes are to the State Centre on Climate Change of the H.P. Council for Science Technology & Environment (HIMCOSTE) for this compilation, which may be a good source of first hand information to the users.

V. Singh.

(Vipin Singh Parmar)





*Chairman HIMCOSTE-cum- Additional Chief Secretary
(Env. S&T), Government of Himachal Pradesh*

Message

During the earliest civilizations, our ancestors favoured certain wild plants over others for their unique characteristics and selected the ones most suited to their needs in various forms as food, fodder, fuel wood, medicine, house building, farm tools and other purposes. Wild plants have received great importance at different places and times of human history given their ability to provide nutrients during scarcity periods and protection for minor health conditions.

Wild edible plants have also played important role in complementing staple agricultural foods. Also these plant species have a high potential for exploitation as a source of new medicine or as a source of some rare vitamins, minerals, specific amino acids or fatty acids. The present compilation in the form of a Coffee Table Book on the Wild Edible Fruits of Himachal Pradesh is a good effort made by the State Centre on Climate Change and HP State Biodiversity Board of the H.P Council for Science Technology & Environment (HIMCOSTE) and wish that this compiled information would be useful for acquiring the information about the importance of the wild edible fruit species of Himachal Pradesh for their proper harnessing.

Tarun Kapoor
(Tarun Kapoor)





Member Secretary (HIMCOSTE)

Preface

Wild fruits are an important source of food for mankind. They are widely consumed in the rural Himalayas, and are potential source of various compounds thus, also used in folk medicines. These wild fruits are an important supplementary source of food for people living in these remote areas. A few species with economic importance were identified and commercially utilised, however, a vast reservoir of edible fruit species remain relatively underexplored and exist in wild form.

Himachal Pradesh represents a scenic splendour in the western Himalayas occupying a diverse terrain from Shivaliks to the greater Himalayas, with a rich biological diversity. More than 90% population of the state belongs to rural parts, and the use of wild edible fruits is more common in these areas. Wild fruits are mostly eaten raw and few are consumed in processed or cooked forms by the local inhabitants. These are rich source of protein, carbohydrate, fat, and other elements but they have not yet been considered as a source of alternative food products. Many of these wild fruits have phytochemicals of unique medicinal importance that demands requisite attention and investigation for their conservation and popularization.

The database compiled in the form of this Coffee Table Book will serve as a source of valuable information on the *Wild Edible Fruits of Himachal Pradesh* along with their nutritional and medicinal importance. Considering the importance of these genetic resources, necessary protection and conservation measures can be adopted to protect them from extinction and retain the ecosystem for their survival. Moreover, cautious exploration of these species would also offer new and lucrative income sources for farmer community in the State.

I appreciate the efforts made by the team from the State Centre on Climate Change of the H.P Council for Science Technology & Environment (HIMCOSTE) in documenting this information as a consolidated framework, so that information on this natural resource could be acquired for its proper harnessing.

(Kunal Satyarthi, IFS)

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Introduction

Nature has provided us with different sources of life forms that have fulfilled the basic needs for our survival on this earth. Food is of prime importance and primitive man ate various types of plants and their parts including fruits. He collected these eatables in wild forms before he learnt to cultivate them. Man identified those plants that were edible and acquired the knowledge for their propagation and subsequently domesticated some of these wild edible species as food. While, a few species with economic importance were identified and commercially exploited for establishment of orchards, a vast reservoir of edible fruit species remained relatively unknown and existed in wild form in their natural habitats. These wild fruits are underexploited and their economic importance has not been realised. Their ethno-botanical knowledge, nutritional values and medicinal uses are limited to those who live in the vicinity of such habitats. Utilization and improvement of these species is constrained by lack of knowledge, inadequate understanding of taxonomy, biology and multiplication of these species.

Himachal Pradesh possesses different agro-climatic zones varying from sub-tropical to temperate, wet temperate to dry arid zones with large variability in land topography. These ecological features led to the evolution of large plant biodiversity. The diversity of wild edible plants in the State is about 360 species which may be a source of fruits, flowers, flower buds, leaves, roots, stem and tubers etc. A number of edible fruit and nut plant species viz. tropical, sub-tropical and temperate types exist in wild forms in their natural habitats in the State. However, some of the plant species such as *Artocarpus lacucha*, *Cordia dichotoma*, *Diospyros lotus*, *Ficus palmata*, *Juglans regia*, etc. were usually cultivated but got naturalized as an escape in forests. These wild fruits are an important supplementary source of food for people living in remote rural areas, difficult hill terrains in the vicinity of forests. Many wild edible fruit plants are nutritionally rich and can supplement the human diet with vitamins, essential amino acids/proteins, micronutrients, phyto-chemicals and antioxidants with specific medicinal importance. The fruits collected from their natural habitats are free from chemical pollutants, thus provide healthy food with protective and curative phyto-chemicals to enhance endurance of human system. Furthermore, these species thrive in their natural habitats and are exposed to various adverse conditions there for are expected to possess resilience against various biotic and abiotic stresses. Evaluation of these genetic resources for the identification of genes for fruit quality, hardiness, resistance against diseases and pests, soil factors etc. will serve as a database for future use.

Therefore, keeping in view their usefulness, it becomes imperative to document these plant species along with their distribution, ethnobotanical and medicinal importance, nutrition profile, phytochemicals and unique value etc. Besides, the information on distribution of habitats of the wild edible fruits may lead to formulation of policies for in-situ conservation of genetic diversity of these underexploited fruit plant species in the form of botanical gardens, conservation grooves and biosphere reserves to provide protection from extinction.

The present compilation is designed in the individual leaflet format and contains information of about 30 species belonging to 27 genera and 20 families having Rosaceae (06 spp.) and Moraceae (04 spp.) the dominant ones. The information compiled in this book will be of immense use to people of the State. They can utilize their waste or degraded lands for plantation of wild fruit species suiting to their locations and utilize them on commercial scale. Some of these species exhibit variability in height, canopy spread and fruit bearing habits. Thus, mixed orchards with multi-tier system will help in efficient utilization of resources to achieve sustainable production. Furthermore, documentation of multiple uses (e.g. medicine, food, fodder, fibre, dyes etc.) and other indigenous knowledge of wild fruits will be useful to scientifically validate their relevance for further commercial exploitation as well as conservation. This information will also be of use to researchers, agro-industries, nutrition specialists, social scientists and policy makers. It will serve as a source of reference for the general public to know the rich nutritional value and medicinal utility of wild edible fruits of Himachal Pradesh.

Aegle marmelos



Aegle marmelos Correa.

Wild Edible Fruits of Himachal Pradesh

Common name : Bael, Bilpatri, Wood apple

Family : Rutaceae

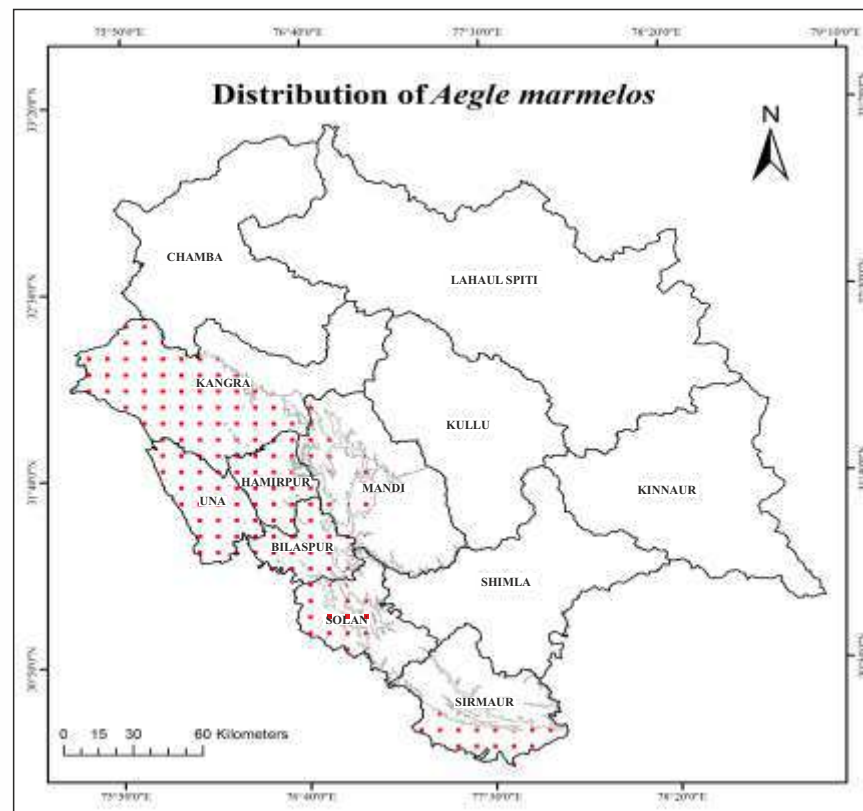
Elevation : 400-700 m

Life form : Medium sized tree

Flowering : March-April

Fruiting : May-June (Next year)

Distribution : Bael is native to South Asia and is cultivated throughout India, mainly in temple premises. In Himachal Pradesh, it is distributed in Una, Kangra, Bilaspur, Hamirpur, Mandi, Nalagarh, Kunihar, Nahan and Paonta Sahib.



Ethnobotanical uses

- ✧ Leaves are offered to lord *Shiva* especially in religious occasions.
- ✧ Fruit pulp is used to prepare delicacies like *murabba* and puddings.
- ✧ *Sharbat* is made by beating the seeded pulp together with milk and sugar.
- ✧ If fresh, the juice is strained and sweetened to make a drink.
- ✧ Mature fruits are made into jam, with the addition of citric acid.
- ✧ A jelly is made from the pulp combined with guava to lessen its astringent taste.
- ✧ The fruit pulp has detergent action.

Medicinal importance

- ✧ Unripe or ripe fruit improves digestion and effective remedy for chronic diarrhoea and dysentery.
- ✧ Ripe fruit is aromatic, astringent, cooling and best of all laxatives. Fruit possesses broad range of therapeutic effects that includes free radical scavenging, antioxidant, inhibition of lipid peroxidation, antibacterial, antiviral, gastroprotective, anti-ulcerative colitis, hepatoprotective, anti-diabetic, cardioprotective and radioprotective effects.
- ✧ The bitter, pungent leaves are made into a poultice and used in the treatments of ophthalmia.
- ✧ Tannin when ingested frequently and in excess doses over a long period of time, is antinutrient and carcinogenic.

Miscellaneous uses

- ✧ An avenue/shade tree in religious premises.

Phytochemicals

- ✧ The pulp contains a balsam-like substance and furocoumarins-psoralen and marmelosin. There is 9% tannin in the fruit pulp and 20% in the rind. The leaves contain many important alkaloids.

Unique value

Marmelosin derived from the pulp is given as a laxative and diuretic. In large doses, it lowers the rate of respiration, depresses heart action and causes sleepiness.

Nutritional profile

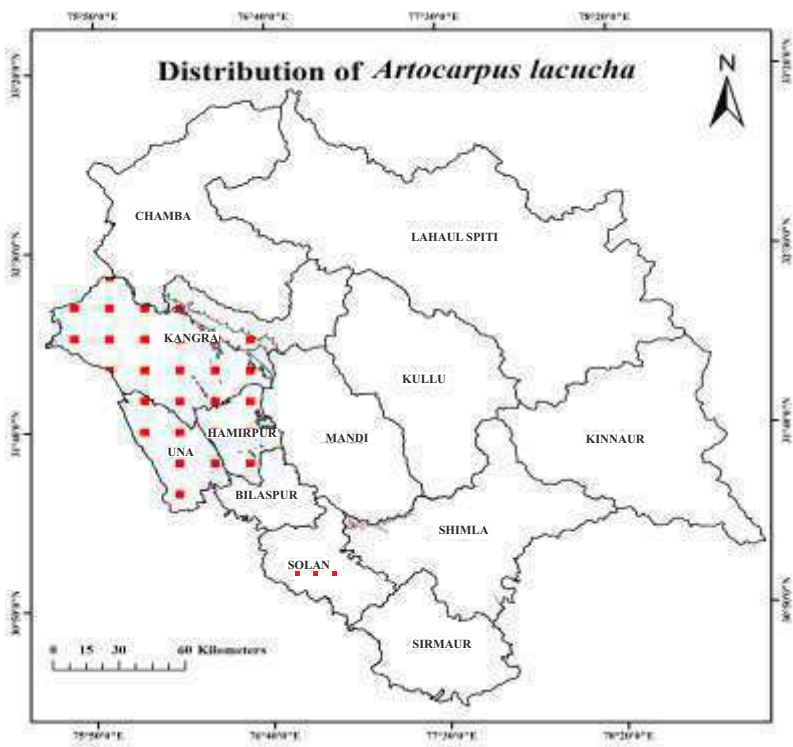
Constituents	Value (per 100g)
Moisture %	90.0
Proteins	2.0 g
Fats	1.0 g
Fibre	2.8 g
Minerals	1.10 g
Calcium	67.0 mg
Phosphorus	25.0 mg
Energy	73 kcal



Artocarpus lacucha Buch.-Ham.

Wild Edible Fruits of Himachal Pradesh

- Common name** : Dheu, Dheun, Lakucha, Lakudi, Monkey Jack
- Family** : Moraceae
- Elevation** : Up to 1200 m
- Life form** : Tree
- Flowering** : March-April
- Fruiting** : June-September
- Distribution** : Dheu is native to Southeast Asia and in India, the species is particularly found in tropical and sub-tropical Himalayas. In Himachal Pradesh, it is sparsely cultivated or naturalized as an escape in the districts of Kangra, Hamirpur, Una and Shimla.



Ethnobotanical uses

- Dheu is mostly used for pickles and chutney preparation. Dried slices are also used in preparation of meat and fish curries Theta impart a very special flavour to the curries.
- The unripe fruits are eaten or cooked as vegetable.
- Fruits are cut into thin slices, dried in the sun and are preserved as an acidulous spice for use in curries or daal as a substitute of tamarind.
- The tree bark is chewed like betel nut.

Medicinal importance

- Ripe fruit is sweet, sour, vata-pitta nashak, kaphkarak, aphrodisiac and also improves taste and appetite.
- The unripe fruit is hot, sweet, sour, causes constipation, impotency, loss of appetite, blood disorders and eye troubles.
- The powder bark is applied to sores to draw out pus and its paste and infusion is useful to heal skin cracks, small pimples, boils and headache.
- The root is an astringent and used as a purgative; it is used as a poultice (after maceration) for skin ailments.

Miscellaneous uses

- Æ A lavish coloured dye is extracted from the wood and roots.
- Æ It is an important component of traditional integrated agroforestry system.

Phytochemicals:

- Æ Alkaloids, steroids, glycosides, saponin and phenolic compounds.

Nutritional profile

Constituents	Value (per 100g)
Moisture %	90.0
Proteins	2.0 g
Fats	1.0 g
Fibre	2.8 g
Minerals	1.10 g
Calcium	67.0 mg
Phosphorus	25.0 mg
Energy	73 kcal

Unique value

It is fed to lactating animals and considered one of the most important milk enhancing fodder.

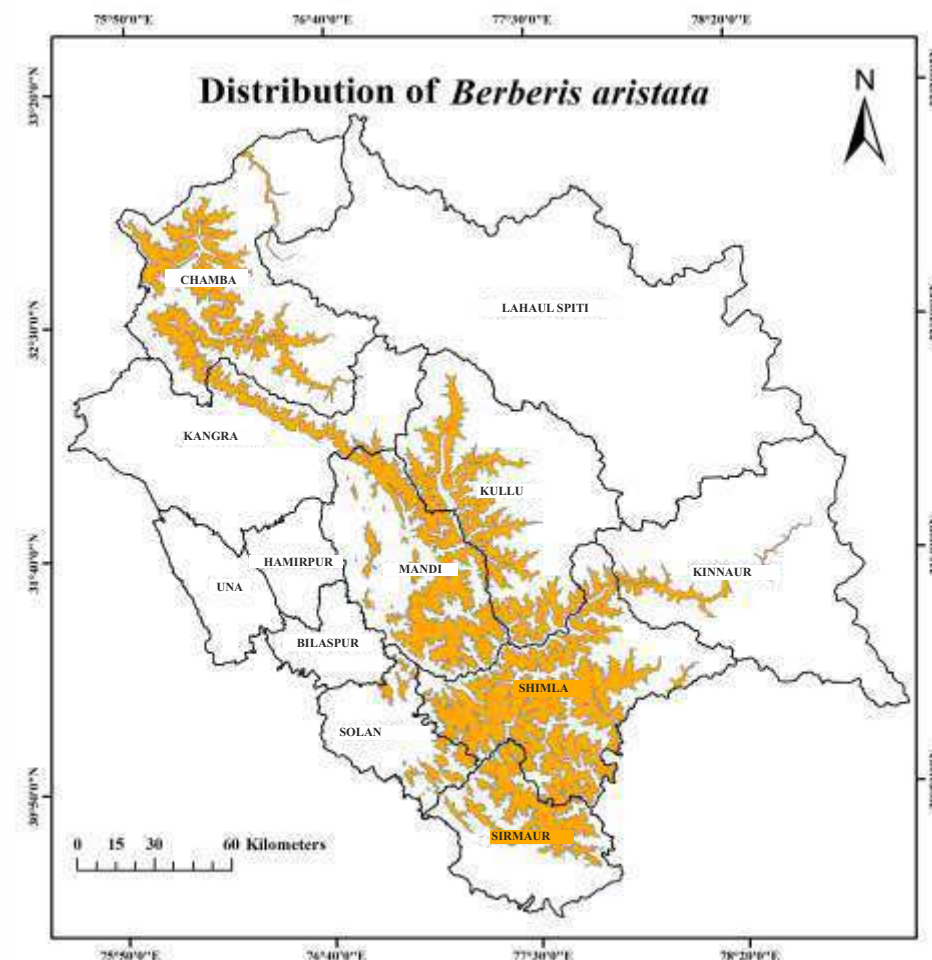
Berberis aristata



Berberis aristata DC.

Wild Edible Fruits of Himachal Pradesh

Common name : Kashmal, Kasmale, Tree turmeric, Indian barberry
Family : Berberidaceae
Elevation : 1600-3000
Life form : Shrub
Flowering : March-April
Fruiting : May-June
Distribution : This plant is native to Himalayas and in Himachal Pradesh it occurs in subtropical to temperate region.



Ethnobotanical uses

- ✦ Fruits are edible and are usually eaten when ripe. A well flavoured fruit, it has a sweet taste with a blend of acid, with a slight bitterness caused by the seeds. Flower buds are added to the sauces.
- ✦ For treating jaundice and other liver disorders, fruits are taken orally along with honey.

Medicinal importance

- ⌘ *B. aristata* is generally used for the preparation of *rasont* (*rasaunt* or *rasanjana*) which is an extract of root/stem bark. It is used in conjunctivitis, as a wash for bleeding piles, wound healing, ulcers, jaundice and for enlarged liver and used as a gargle for mouth ulcers.
- ⌘ Berberine in the form of salts as berberine hydrochloride and berberine sulphate is used in dyspepsia, diarrhoea, malarial infections, amenorrhoea, enlargement of the spleen, anorexia, vomiting during pregnancy and intestinal catarrh.

Miscellaneous uses

- ⌘ Extraction of *rasont* at commercial level is done for various types of ayurvedic formulations.
- ⌘ Plant can be used as a biological fence.

Phytochemicals

- ⌘ Alkaloids, tannins, phenolic compounds, sterols and triterpenes.

Unique value

Rasont is useful in conjunctivitis, ophthalmia, mouth sores and ulcerations of the skin and effectively reduces the uterine inflammations.

Nutritional profile

Constituents	Value (per 100 ml of juice)
Proteins	2.3 g
Sugars	12.0 g
Tannin	0.6 g
Pectin	0.4 g
Vitamin C	4.6 mg
Ash	2.0 g

Bombax ceiba



Bombax ceiba L.

Wild Edible Fruits of Himachal Pradesh

Common name : Simal, Semul, Simbal, Silk Cotton tree

Family : Bombacaceae

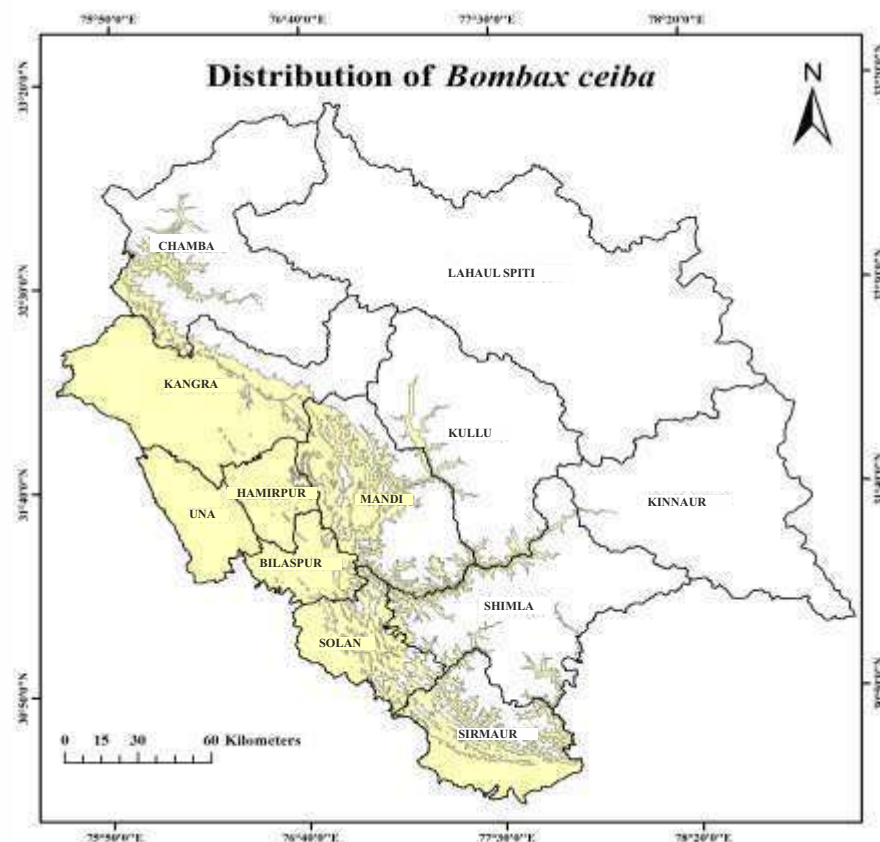
Elevation : Up to 1200 m

Life form : Tree

Flowering : December - April

Fruiting : May - October

Distribution : *Bombax ceiba* is native of Indian subcontinent, Asia-Tropical and common in sub-Himalayan area, it occurs in tropical to sub-tropical areas of the State.



Ethnobotanical uses

- ✧ The unopened flower buds and fleshy calyx are boiled, sieved and cooked like vegetables.
- ✧ The tender fruits, though slightly bitter, taste like lady's finger and hence known as *semal bhindi*, therefore also cooked as vegetable.
- ✧ Young roots are eaten either raw or roasted.
- ✧ The paste of flowers and leaves is useful in skin infections.
- ✧ The seed floss is used for stuffing material for pillows which are used especially for giving shape to the head of newly born babies.

Medicinal importance

- ✧ Young fruits are expectorant, stimulant, diuretic and considered useful in calculus, chronic inflammation, ulceration of bladder and kidneys.
- ✧ Root is astringent, stimulant, tonic, aphrodisiac, emetic and demulcent.
- ✧ Flower is useful in dysentery, diarrhoea, haemoptysis, excessive bleeding and eczema.
- ✧ Gum is styptic, analgesic, astringent, aphrodisiac and useful in menorrhagia/metrorrhagia.

Miscellaneous uses

- ✧ It is a multipurpose tree which is often grown as an ornamental tree, where it is particularly valued for its short-lived, sweetly scented flowers that attract different pollinators and birds and encourage the stay of pollinators (bee colonies) in the area.
- ✧ In vermin prone areas, its plantation may be done to rejuvenate the wastelands.
- ✧ It is also a substitute for cottonseed oil for making soaps.

Phytochemicals

- ✧ Fresh petals contain anthocyanin, pelargonidin-glucopyranoside, cyanadin-glucopyranoside, beta-sitosterol, beta-D-glucoside, quercetin and kaempferol.

Unique value

The fibre extracted from the bark has waterproof and sound-proof properties which are used as insulation material in refrigerators, as packing material and making quality ropes.

Nutritional profile

Constituents	Value (per 100g)
Moisture %	85.6
Proteins	1.4 g
Carbohydrates	11.9 g
Minerals	0.01 g
Calcium	92.2 mg
Phosphorus	49.0 mg
Magnesium	54.2 mg

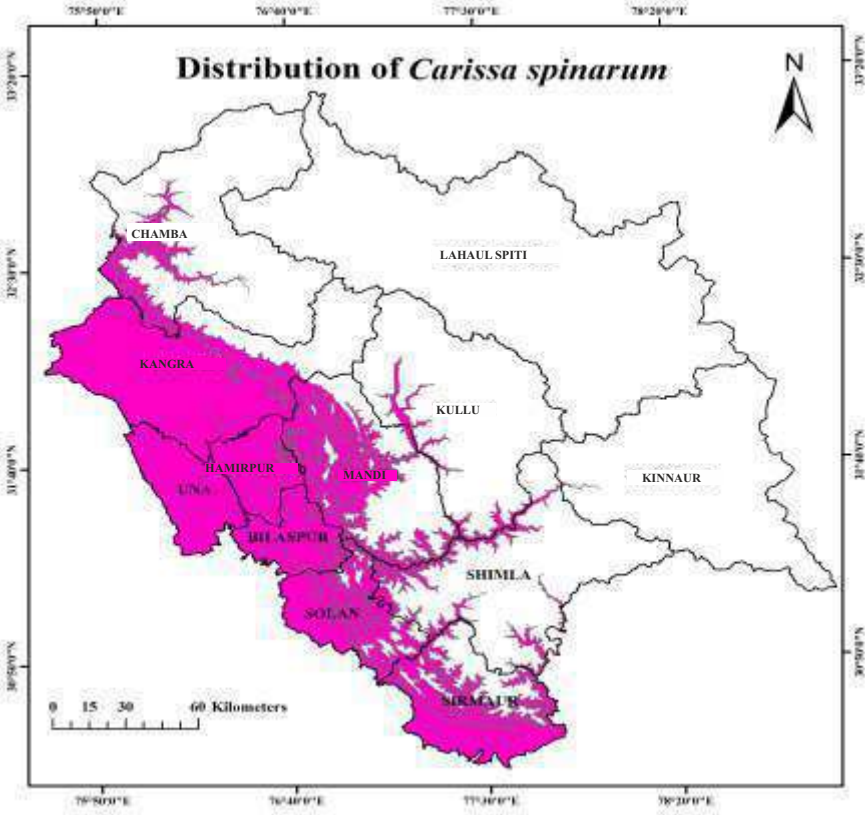
Carissa spinarum



Carissa spinarum L.

Wild Edible Fruits of Himachal Pradesh

Common name : Kharnu, Garna, Karondhu, Conkerberry
Family : Apocynaceae
Elevation : Up to 1500 m
Life form : Shrub
Flowering : March-May
Fruiting : June-September
Distribution : This shrub is distributed in tropical Asia, Africa and Australia. In India it occurs wild and in semi-arid areas and in Kangra, Hamirpur, Bilaspur, Una, Mandi, Solan and Sirmaur districts of Himachal Pradesh.



Ethnobotanical uses

- ✦ The ripe berries taste sweet and are eaten raw or as cooked preserve.
- ✦ The roots act as a repellent to snakes, and powdered roots mixed with water are poured into snake pits to ward off snakes.
- ✦ The bushes of this plant are thorny and are used as an effective fence in rural areas. These bushes are very hardy, drought-tolerant and grown even on very poor and rocky soils.

Medicinal importance

- ✦ The roots of garna plant are ground and applied on the wounds of cattle to kill worms.
- ✦ The warm root decoction is recommended to cure lower abdominal pains during pregnancy.
- ✦ The fruit is a strong purgative and is used as one of the ingredients in some purgative preparations.
- ✦ Its roots are used in combination with the roots of some other medicinal plants to treat rheumatism.

Miscellaneous uses

- ✦ The plant can be used for rejuvenation of degraded slopes/wastelands.
- ✦ The shrub can be used as natural forage for goats and sheep.

Phytochemicals

- ✦ Glycosides, lignans, coumarins, glycosides and volatile oils.

Unique value

A paste of the pounded roots serves as a fly repellent. Root decoction is used for the treatment of epilepsy.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	64.00
Carbohydrates	12.20 g
Fats	0.13 g
Proteins	0.04 g
Ash	1.62g
Phosphorus	0.06g
Potassium	0.50g
Calcium	0.05g
Magnesium	0.05g
Iron	0.01 g

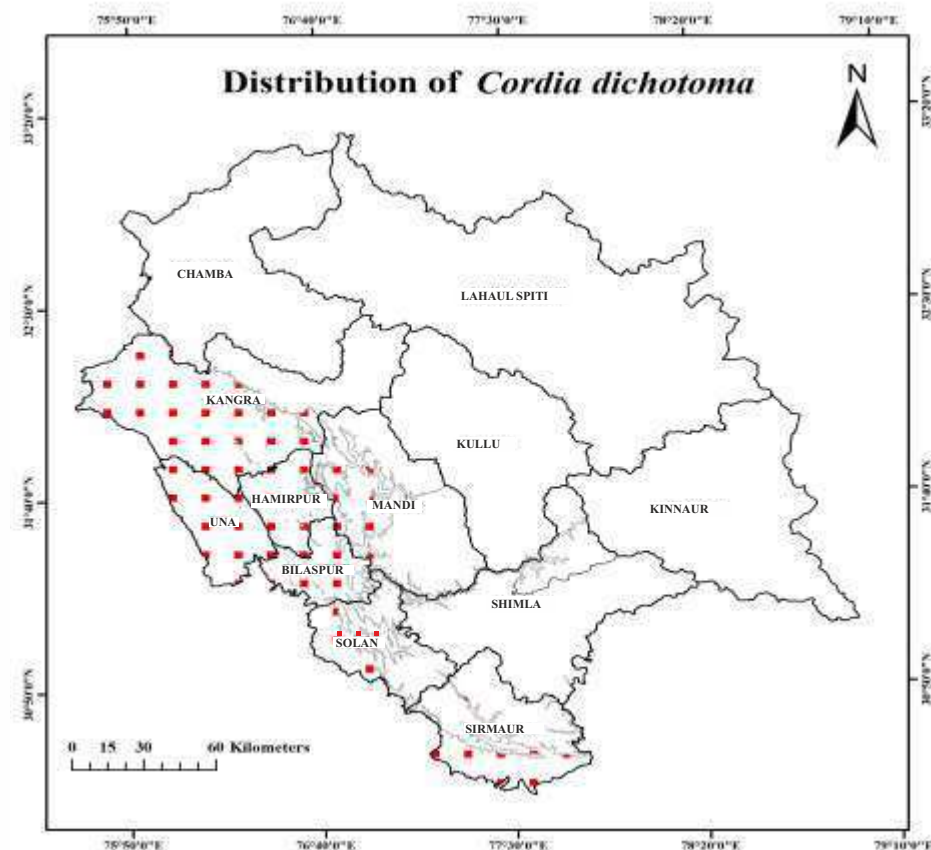
Cordia dichotoma



Cordia dichotoma Forst.

Wild Edible Fruits of Himachal Pradesh

Common name	: Lasuda, Salora, Indian cherry
Family	: Boraginaceae
Elevation	: Up to 1200 m
Life form	: Small tree
Flowering	: March-May
Fruiting	: July-September
Distribution	: Lasuda is native to China and grows in the sub-Himalayan tract and its outer ranges. In Himachal Pradesh, it is sporadically cultivated in Bilaspur, Hamirpur, Mandi, Kangra, Solan, Una, Sirmaur and in between Rampur and Jeori of Shimla district.



Ethnobotanical uses

- ✧ The raw fruits are preserved in the form of pickle and also cooked as vegetable.
- ✧ The ripe fruits are edible, highly mucilaginous, sweet and cooling.
- ✧ Tender leaves are also cooked as green vegetable.
- ✧ Leaf ash mixed with honey is recommended for constipation.

Medicinal importance

- ✧ The mucilage in the fruit is used for treating cough and diseases of the chest, uterus, urethra etc. and has laxative property.
- ✧ The kernels of the fruit are a good remedy for ringworms.
- ✧ The decoction of leaves is used in cough and cold.
- ✧ The bark along with pomegranate-rind is given for dysentery. The decoction of the bark is found useful in calculous infections, strangury, catarrh, dyspepsia and fever.
- ✧ Moistened bark is applied externally on boils, tumours and powder is used to cure mouth ulcers.
- ✧ The leaves of the plant contain B- sitosteryl-3B- glucopyranoside, chlorophyll and B-sitosterol. The twig of the plant has lenolenoyl glycerol. The plant has linolenic acid and allantoin.

Miscellaneous uses

- ✧ It is a very good shade tree.

Phytochemicals

- ✧ Steroid, alkaloid, saponin, cardiac glycosides, flavonoid and phenolic

Unique value

Lasuda contains allantoin (a cell-proliferant and wound-healing substance), an herbal medicine which hastens the healing process.

Nutritional profile

Constituents	Value (per 100g)
Proteins	2.0 g
Fats	2.0 g
Fibres	2.0 g
Calcium	55.0 mg
Phosphorus	275.0 mg
Zinc	2.0 mg
Iron	6.0 mg
Oxalic acid	250.0 mg

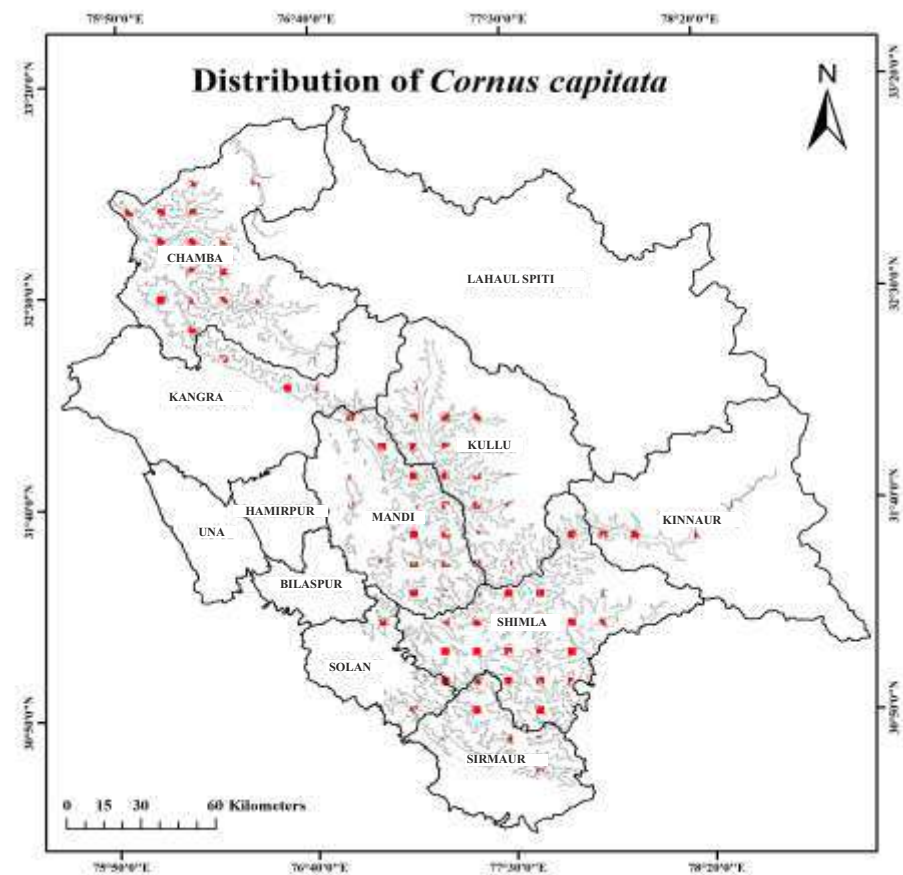
Cornus capitata



Cornus capitata Wall. ex Roxb.

Wild Edible Fruits of Himachal Pradesh

Common name	:Tharbal, Dhrambal, Himalayan strawberry tree, Evergreen dogwood
Family	:Cornaceae
Elevation	: 1300-3000 m
Life form	: Small tree
Flowering	: April-May
Fruiting	: November-December
Distribution	:This plant is native to Himalayas. It occurs in temperate parts of Shimla, Mandi, Kullu, Sirmaur, Chamba, Kinnaur and Kangra districts of Himachal Pradesh.



Ethnobotanical uses

- Æ Fruit having a bitter-sweet flavour and taste like an over-ripe banana.
- Æ The fruit can also be used in preserves.
- Æ The bark of the dogwood is used to treat external haemorrhoids.
- Æ The fruits are widely used to treat dysentery and diarrhoea.

Medicinal importance

- Æ All the parts of the plant contain tannins which are astringent and possess therapeutic properties.
- Æ A tincture can be prepared from leaves/bark of the plant which is used to treat various ailments such as eczema, skin infections, intestinal parasites and gout etc.

Miscellaneous uses

- Æ Dogwood tea is effective in inducing vomiting as well as bringing about relaxation in sick persons.

Phytochemicals

- Æ Tannis, gallic acid, saponins, alkaloids, oxalates and other phenolics.

Nutritional profile

Constituents	Value (per 100g)
Proteins	2.0 g
Fats	2.0 g
Fibres	2.0 g
Calcium	55.0 mg
Phosphorus	275.0 mg
Zinc	2.0 mg
Iron	6.0 mg
Oxalic acid	250.0 mg

Unique value

The bark is rich in tannin and can be used as a substitute for quinine.

Corylus jacquemontii



Corylus jacquemontii Decne.

Wild Edible Fruits of Himachal Pradesh

Common name : Thangi, Jhangi, Sayalu, Thangoli, Bhotia Badam,
The Himalayan Hazel

Family : Betulaceae

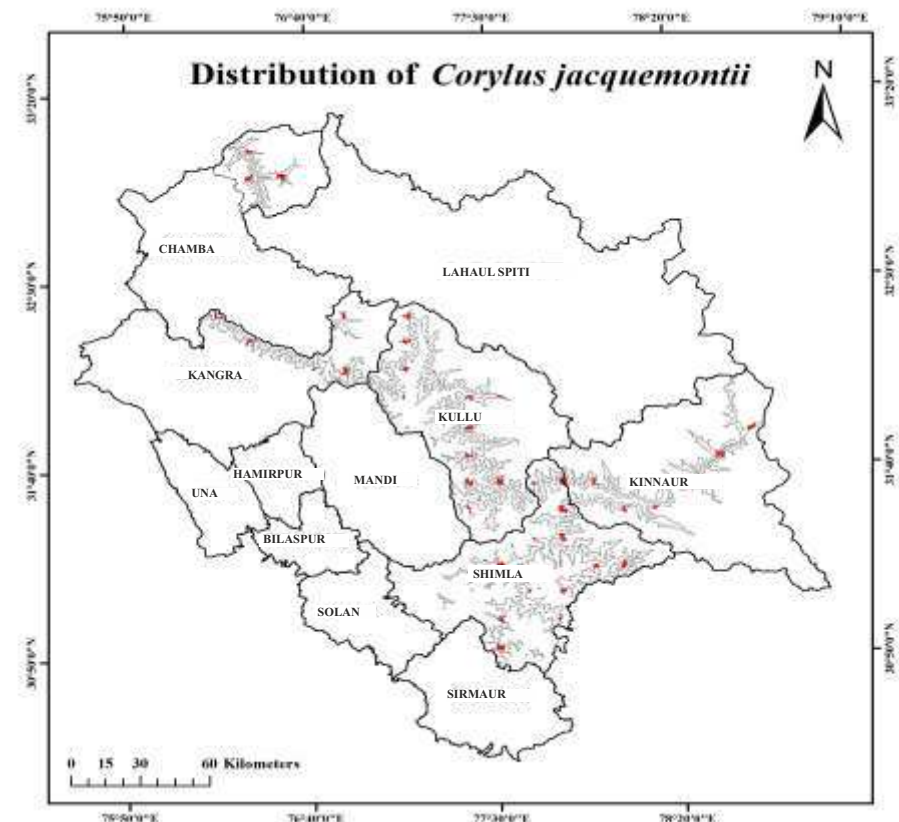
Elevation : 1650-3150 m

Life form : Medium sized tree

Flowering : March-April

Fruiting : July-August

Distribution : This plant is native to Himalayas and distributed from Kashmir to Kumaun (Uttarakhand). In Himachal Pradesh it occurs in small pockets of Chamba (Pangi), Kinnaur, Shimla, Kullu and Kangra



Ethnobotanical uses

- ✦ The nuts are eaten raw or roasted.
- ✦ The oil is extracted from the kernels and is used for edible purposes especially in Pangi (Chamba).
- ✦ Nut garlands are used during festivals and ceremonies in tribal areas of Chamba district.

Medicinal importance

- ✦ Indian tree hazel exert strong protective influence against coronary heart problems and some types of cancer.

Phytochemicals

- ✦ Gallic acid, catechin, epicatechin, quercetin, kaempferol, syringic acid and p-coumaric acid.

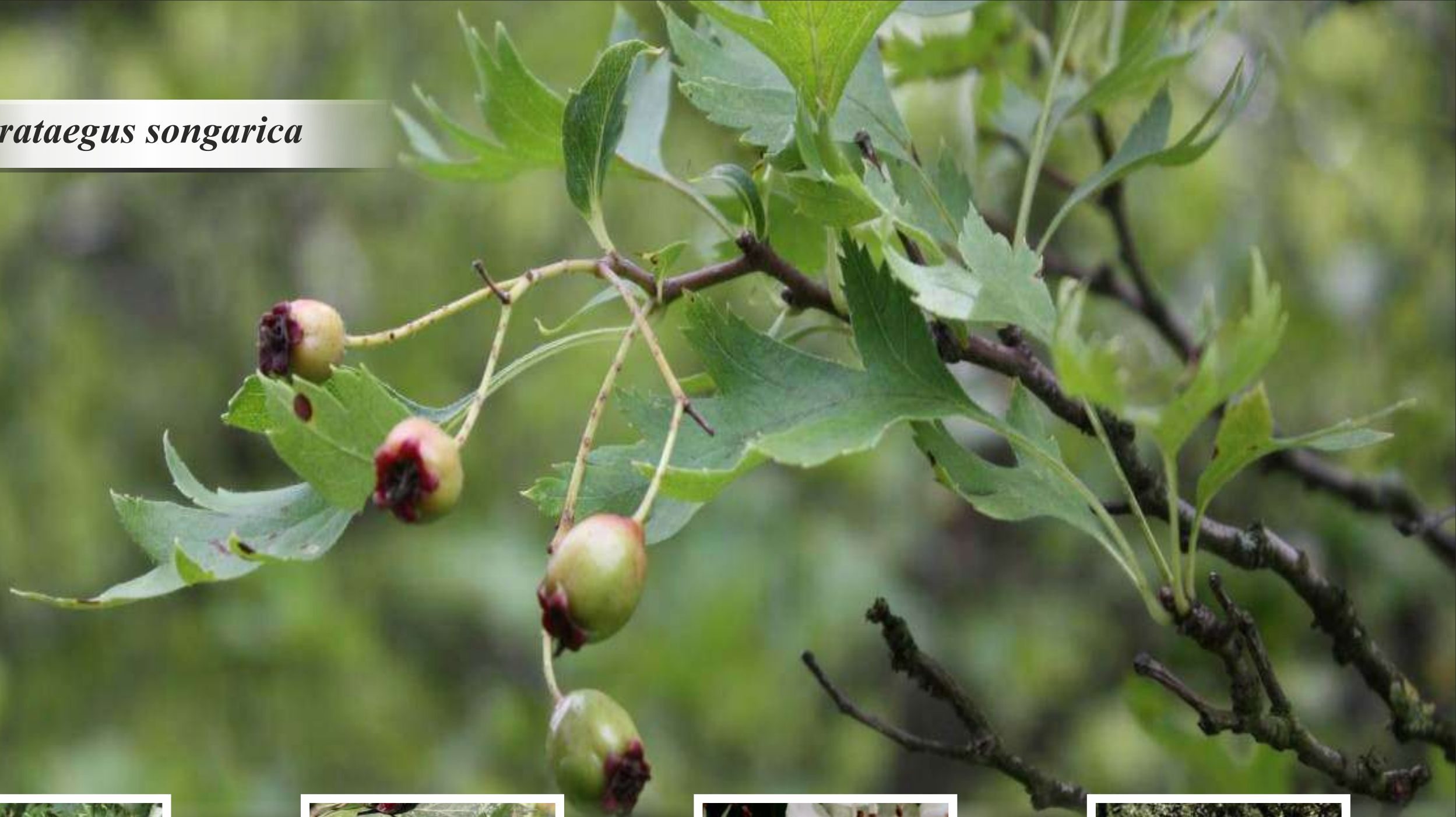
Nutritional profile

Constituents	Value (per 100g)
Moisture %	3.1
Proteins	10.8 g
Fats	63.2 g
Carbohydrates	19.8 g
Fibre	2.3 g
Ash	2.6 g
Phosphorus	319.0 mg
Calcium	254.0 mg
Iron	3.6 mg
Carotene	128.0 mg

Unique value

The Thangi plant is used as a “heart healthy food”

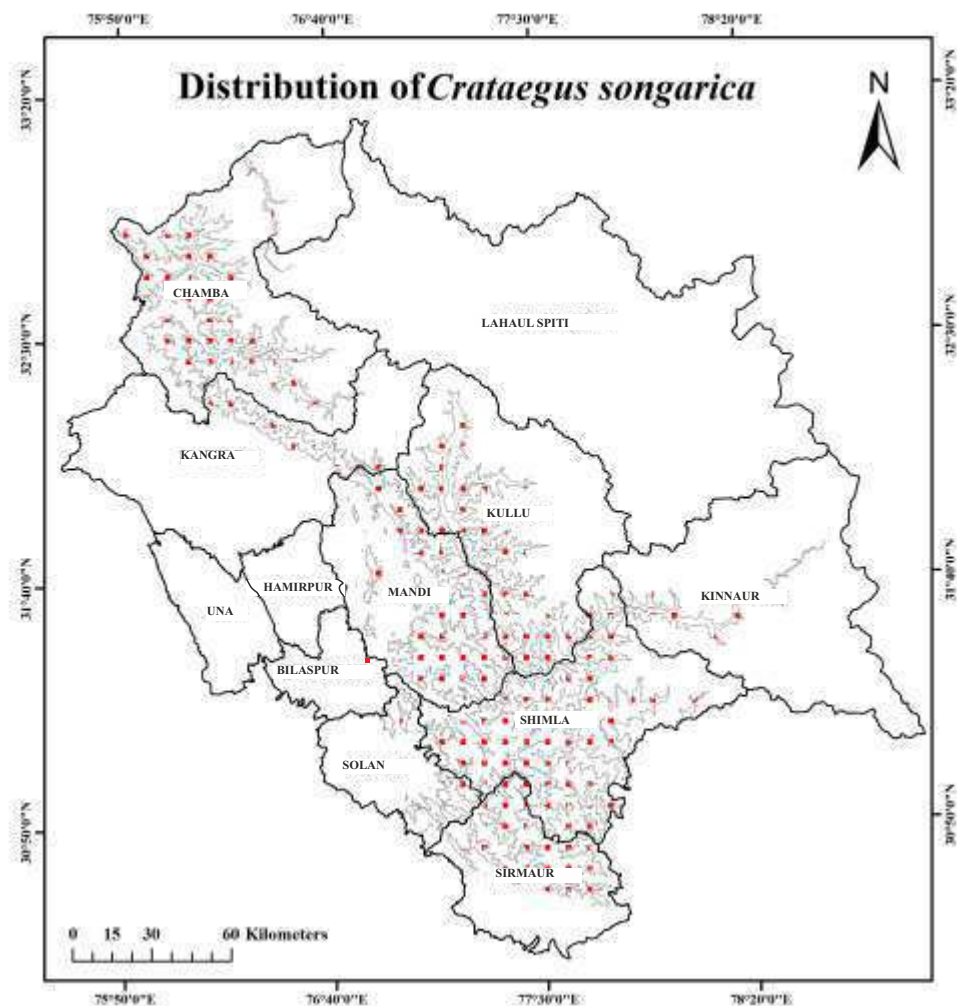
Crataegus songarica



Crataegus songarica K. Koch

Wild Edible Fruits of Himachal Pradesh

Common name	: Ramjag, Van-Sangli, Pandaakh, Asian Hawthorn
Family	: Rosaceae
Elevation	: 1700-3000 m
Life form	: Shrub or Small tree
Flowering	: April-May
Fruiting	: July-August
Distribution	: Hogberry is native to Northern Europe and occurs in temperate areas of Himachal Pradesh.



Ethnobotanical uses

- ✦ The fruits are edible and have sour, sweet, slightly warming qualities.
- ✦ The extract or juice, locally known as *Ghingaaru*, is used as a tonic for heart diseases in Chamba area of the State. A beverage, similar to tea, is also prepared from the rind and seeds.

Medicinal importance

- ✦ Hawthorn fruits are used in several herbal preparations for hypertension, congestive heart failure and arrhythmia.
- ✦ Hawthorn improves the blood supply to the heart by dilating the coronary vessels; improves the metabolic processes in the heart, which result in an increase in the force of contraction of heart muscle, and elimination of certain types of rhythm disturbances; inhibits angiotensin-converting enzyme.
- ✦ Bioflavonoids of the plant are strong antioxidant that relax and dilate the coronary arteries. This increases the blood flow of heart muscle and reduces the symptoms of angina and contractions of the heart muscle.

Phytochemicals

- ✦ Phyto-constituents are amines, amygdalin, bioflavonoids coumarin (an anti-coagulant), crataegin (alkaloid contained in the bark), glycosides, tannins, triterpenoid and saponins.

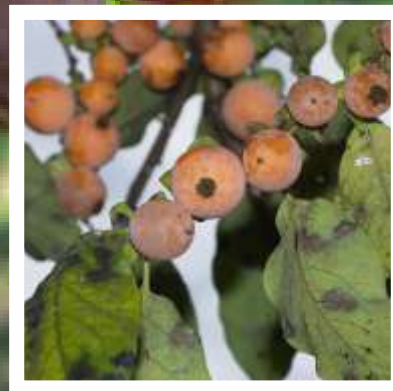
Nutritional profile

Constituents	Value (per 100 ml of juice)
Flavones	560 µg
Sugars	4-6 g
Potassium	19.0mg
Sodium	17.0 mg
Calcium	7.0 mg
Magnesium	4.0 mg
Zinc	278 µg
Copper	2.0 µg
Iron	250 µg
Vitamin B ₁	106 µg
Vitamin B ₂	390 µg
Vitamin C	28.0 mg

Unique value

Crataegus songarica possesses flavonoid components which have cardiovascular activity.

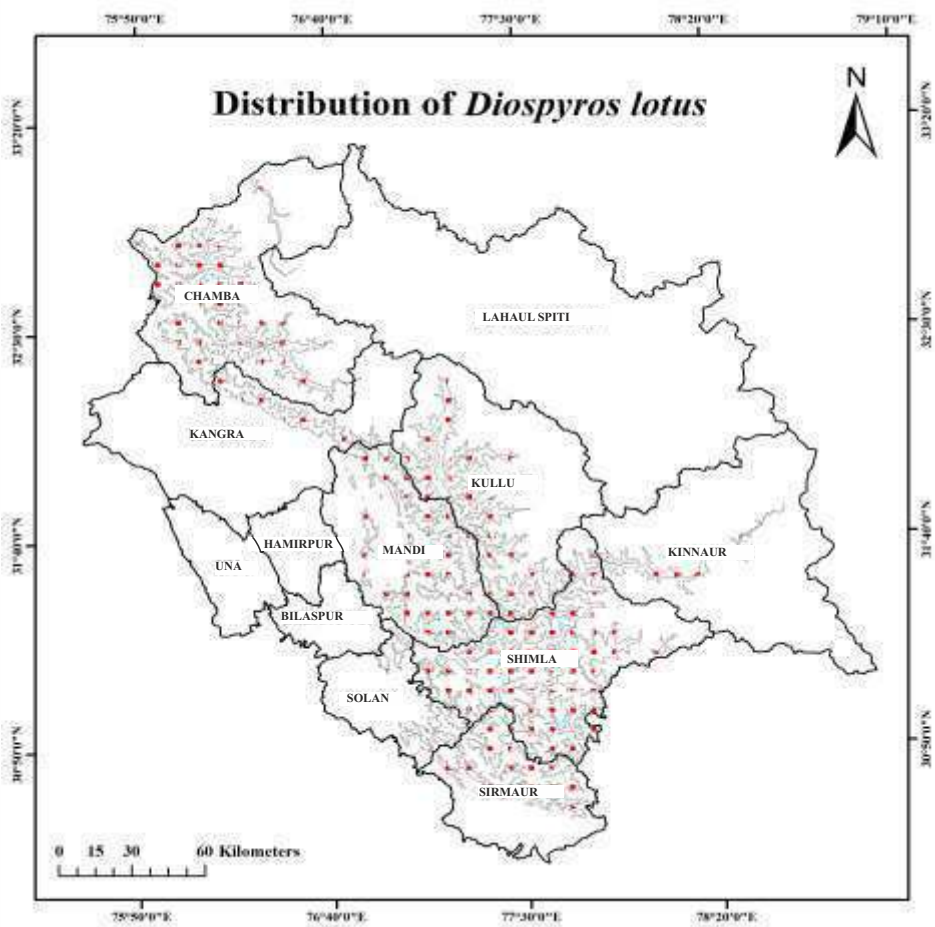
Diospyros lotus



Diospyros lotus L.

Wild Edible Fruits of Himachal Pradesh

- Common name** : Amlook/Malook, Date plum, Wild Persimmon
- Family** : Ebenaceae
- Elevation** : 1500-2500 m
- Life form** : Medium sized tree
- Flowering** : April-May
- Fruiting** : September-October
- Distribution** : The plant is native to Caucasian region and is usually planted around localities but often as an escape naturalized in sub-tropical to sub-temperate regions of Himachal Pradesh.



Ethnobotanical uses

- The fruit is consumed raw, cooked or dried which gives a date like flavour, hence the name Date Plum.
- They are also used in making of dried fruit leather, jam and jelly, ice-cream, sweet sauces, and brandy.
- The dried fruits are also distributed to devotees in various temples of northern hill States as *prasad*.

Medicinal importance

- The fruit is used as a sedative, astringent, analgesic, nutritive, antiseptic, anti-diabetic, anti-tumor, laxative and antipyretic.
- The fruit contains significant amount of anti-oxidants that might be helpful for reducing the heart diseases and carcinogenic infections in human population.
- It has potential to provide defensive mechanism against broad spectrum infections caused by pathogenic microorganisms.
- Triterpenoids isolated from fruit show anti-inflammatory activity.

Nutritional profile

Constituents	Value (per 100g)
Carbohydrates	11.42 g
Proteins	0.70 g
Total fats	0.28 g
Fibres	0.40g
Sodium	0.10 mg
Potassium	157.00 mg
Calcium	0.60 mg
Iron	0.17 mg
Magnesium	0.70 mg
Phosphorus	0.16 mg
Selenium	1.00 µg
Zinc	0.10 mg
Energy	46 kcal

Unique value

The seedlings raised from the seeds are used as rootstock for commercial persimmon varietie

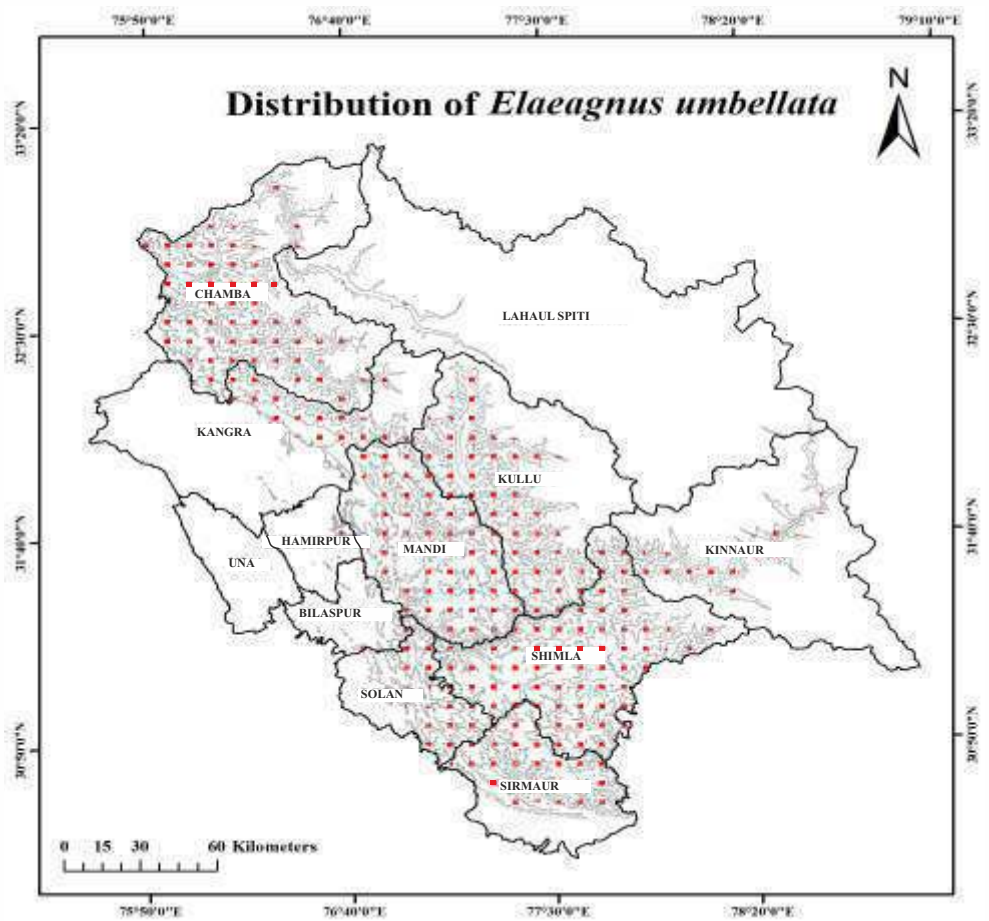
Elaeagnus umbellata



Elaeagnus umbellata Thumb.

Wild Edible Fruits of Himachal Pradesh

Common name : Ghain, Chindar, Autumn olive, Bastard oleaster
Family : Elaeagnaceae
Elevation : 1200-3000 m
Life form : Shrub
Flowering : April-June
Fruiting : June- September
Distribution : *Elaeagnus umbellata* is native to Japan and is usually distributed in temperate parts of Himachal Himalayas.



Ethnobotanical uses
✦ Ripe fruits are juicy, pleasantly acidic and tasty, eaten as fresh or pickled while unripe fruits have astringent taste.
✧ Fruits are also processed into juice, jam and other preserves.

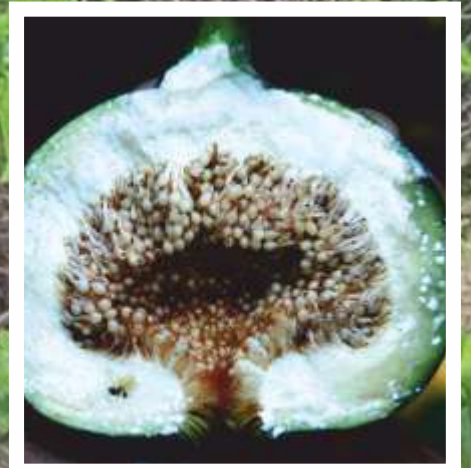
Medicinal importance
✦ In fresh berries, lycopene content is very high (15–54 mg/100g) in comparison to tomato (3 mg/100g) which prevents heart diseases, cancer of prostate, breast, lung, bladder, ovaries, colon and pancreas.
✧ Lycopene reduces free radicals from the body.
✦ Recent studies suggested that lycopene may boost sperm concentrations in men with infertility, and lowers the risk of prostate cancer.
✧ The flowers and seeds are used as astringent and cardiac stimulant.
✦ The seed oil with syrup is given in catarrhal, pulmonary infection and bronchial complaints.

Miscellaneous uses
✦ The shrub possesses deep root system and has potential to be planted for rejuvenation of the degraded slopes/wastelands.
Phytochemicals
✦ The berry contains appreciable amount of phenolic, flavonoid, carotenoid, tannin, alkaloid and saponins contents.

Unique value
The fresh berries of the plant contain very high lycopene content which is a powerful antioxidant and used for treating human papilloma virus (HPV) infection, a major cause of uterine cancer.

Nutritional profile	
Constituents	Value (per 100g)
Moisture%	85.7
Carbohydrates	11.9g
Proteins	0.3g
Fats	0.1 g
Crude fibre	20.0 g
Phosphorus	1.7 mg
Calcium	10.0 mg
Iron	0.4 mg
Magnesium	0.03 mg
Potassium	0.34mg
Vitamin C	27.8 mg
Energy	50 kcal

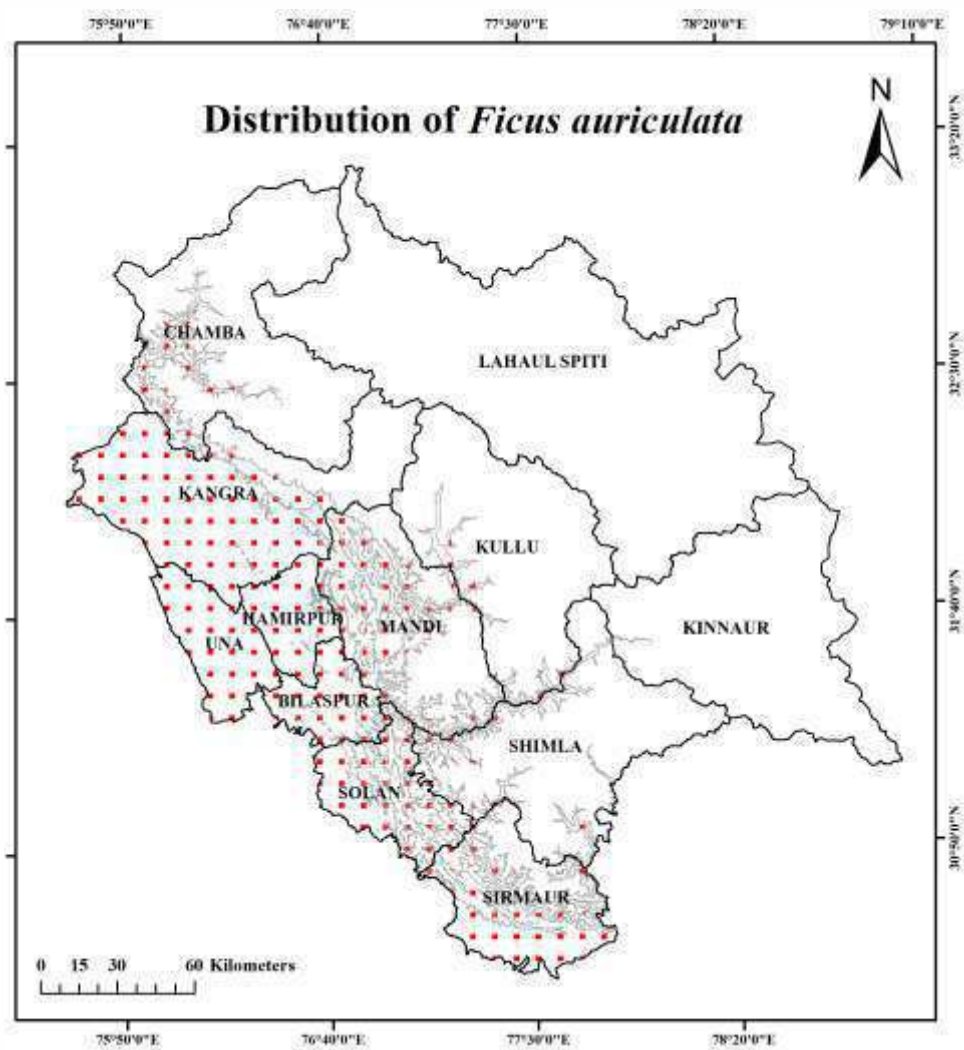
Ficus auriculata



Ficus auriculata Lour.

Wild Edible Fruits of Himachal Pradesh

Common name	: Tiamble, Timla, Elephant ear fig tree
Family	: Moraceae
Elevation	: 600-1400 m
Life form	: Small tree
Fruiting	: April-August
Distribution	: The plant is native to Himalayas. It occurs in sub-tropical areas of Himachal Pradesh and usually found nearby streams/damp valleys.



Ethnobotanical uses

- ☞ Ripe fruits are eaten fresh or preserved as jam, while unripe are cooked as vegetables.
- ☞ Leaves have galactagogue properties and are given to lactating mothers while leaf juice is used in the treatment of leucoderma, blisters and boils.
- ☞ The latex from the stem is applied to cuts and wounds.
- ☞ Stomach disorders are treated by taking 50-100 ml fresh juice of leaves with water.
- ☞ The roasted fruit is used in the treatment of diarrhoea and dysentery.

Medicinal importance

- ☞ Fruit, stem bark and leaves have antioxidant activities and prevent cardiovascular /neurodegenerative diseases and cancer.
- ☞ Presence of phenolic compounds as their major components have enormous potential for antifungal, anthelmintic and antimicrobial activity against *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Escherichia coli*.
- ☞ Consumption of fruits may promote general health and reduce the risk of other chronic diseases.

Miscellaneous uses

- ☞ *Ficus auriculata* is planted for the management of soil erosion.
- ☞ Leaves of the plant are used as fodder for ruminants.

Phytochemicals

- ☞ Specific chemicals are alkaloids, saponins, glycosides, resins, phenols, tannins, diterpenes and flavonoids.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	46.64
Proteins	5.32g
Fibres	16.96g
Fats	0.65g
Carbohydrates	27.09g
Vitamin C	0.09g
Ash	3.70 g
Calcium	1.35 mg
Magnesium	0.90 mg
Nitrogen	0.85 mg
Potassium	2.11 mg
Phosphorus	0.28 mg

Unique value

Fruit, stem bark and leaves have strong antioxidant and free radical scavenging activities which makes it useful food additive or nutraceutical.

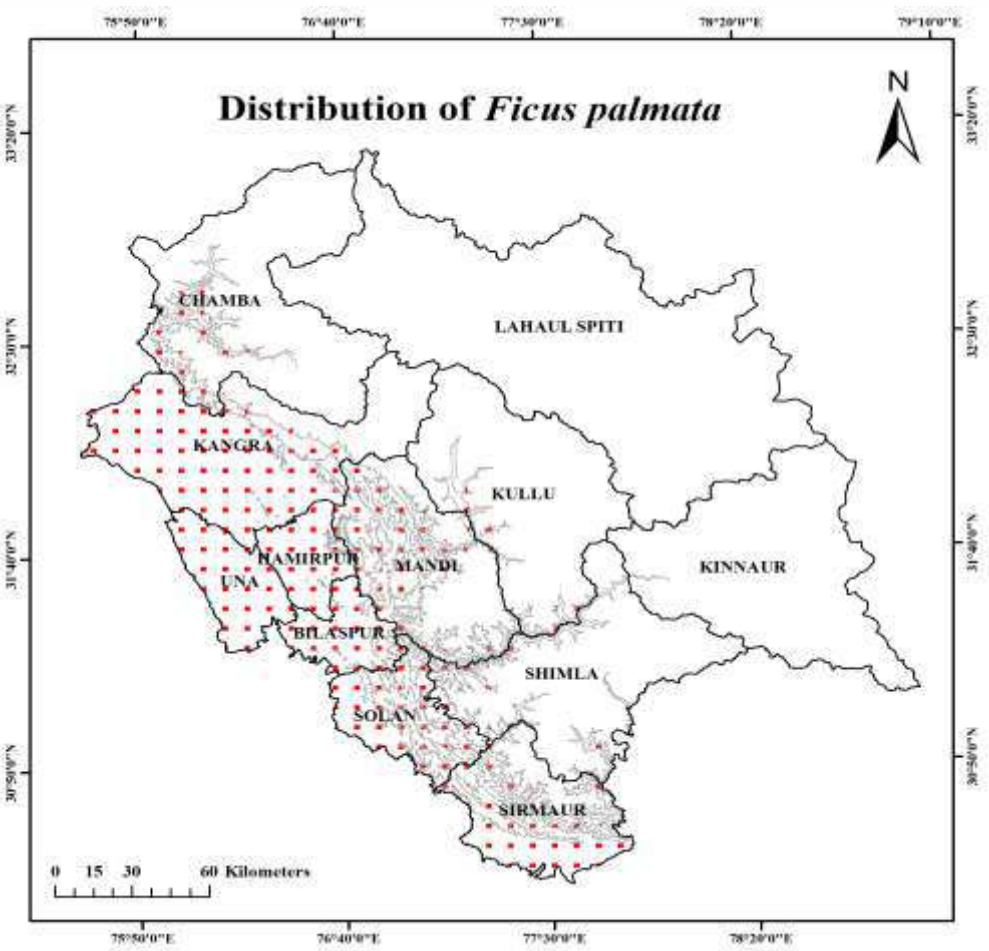
Ficus palmata



Ficus palmata Forssk.

Wild Edible Fruits of Himachal Pradesh

Common name : Fegra, Dagla, Dudha, Bedu, Wild fig
Family : Moraceae
Elevation : Up to 2000 m
Life form : Small tree
Flowering : March-April
Fruiting : June-July
Distribution : This plant is native to India and occurs in sub-tropical to sub-temperate areas of Himachal Pradesh. The species grows in boundaries/bunds of cultivated fields, wastelands and near domesticated areas.



Ethnobotanical uses

- ☞ Ripe fruits are consumed as raw, contain good quantity of juice (45%).
- ☞ Unripe fruits are boiled, water removed by squeezing and eaten as fried vegetables or as *riata* (mixed with curd).
- ☞ The tender young leaves are also cooked as vegetable.
- ☞ Plant latex is used locally to remove thorn from the skin and quick healing of thorn pits.
- ☞ Traditionally, thin branches are used as perforated sieves for steam cooking of different preparations like *siddu/momos/patrod* (*Colocasia* leaves).

Medicinal importance

- ☞ The fruits contain chiefly sugars and mucilage and act as a demulcent, emollient, laxative.
- ☞ The sap is used in the treatment of warts.
- ☞ *Ficus palmata* plant is used in various diseases *e.g.* gastrointestinal, hypoglycemic, anti-tumour, anti-ulcer, anti-diabetic, lipid lowering and antifungal activities.

Miscellaneous uses

- ☞ The leaves are used as fodder to milch animals to increase milk production.
- ☞ The tree has a potential to rejuvenate degraded and fragile lands.

Phytochemicals

- ☞ Plant extracts contain alkaloids, tannins, flavonoids, terpenoids and cardiac glycosides. New isomer of psoralenoside namely, trans-psoralenoside in addition to one triterpene: germanicol acetate, two furanocoumarins: psoralene, bergapten, one aromatic acid vanillic acid and the flavone glycoside rutin.

Unique value

Fresh fruits contain bioactive agents particularly diethyl phthalate which has pharmaceutical importance as an antimicrobial agent.

Nutritional profile	
Constituents	Value (per 100g)
Moisture%	80.5
Proteins	1.72 g
Total soluble sugar	12.5 g
Pectin	0.21 g
Vitamin C	3.35 mg
Ash	0.92 g
Magnesium	0.076 mg
Calcium	0.071 mg
Potassium	0.296 mg
Phosphorus	0.034 mg

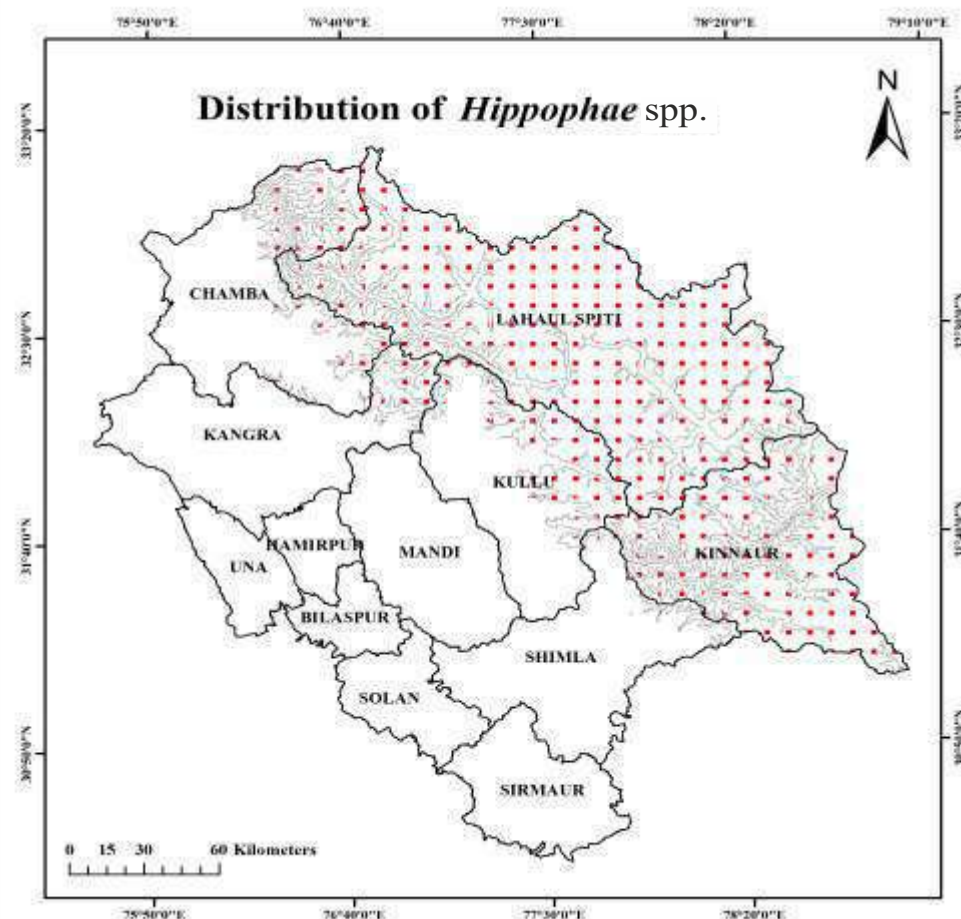
Hippophae spp.



Hippophae spp.

Wild Edible Fruits of Himachal Pradesh

- Common name** : Chharma, Suri, Charla, Leh berry, Seabuckthorn
Family : Elaeagnaceae
Elevation : 1500-3600 m
Life form : Small tree
Flowering : June-July
Fruiting : October-November
Distribution : This plant is native to Europe and Asia. It is distributed in cold and dry arid temperate areas of Himachal Pradesh. The three species of *Hippophae* which are distributed in the state are *H. salicifolia*, *H. rhamnoides* and *H. tibetana*.



Ethnobotanical uses

- ✧ Fruits are sour, rich source of vitamin-C and are eaten raw as well as used for making chutney.
- ✧ Besides juice, fruits have been utilized for preparing jams, jelly, marmalades, pickles, snacks, seabuckthorn milk and yoghurt, sauce, wine and sweet cream.
- ✧ Dried fruit powder is used for making green tea.
- ✧ Root powder and fruits are used for making local wine.
- ✧ Leaves are used as fodder and fuel.

Medicinal importance

- ✧ Seed contains high quality essential oil which has medicinal properties. It is used to prevent skin wrinkling, swelling, antibiotics, for relaxation and helps in building up new tissues.
- ✧ Seed oil is used as ingredient material for cosmetics and sunscreen.
- ✧ An important compound RH-3, isolated from fruits enhances spermatogonial proliferation, increases stem cell survival and reduces sperm abnormality.
- ✧ Crude extracts of fruits delay onset of neurodegenerative diseases in post-menopausal women.
- ✧ In the fruit extract, 16 anti-inflammatory, anti-irritant and anti-microbial agents are present which are autoimmune moderator, potential against atopic dermatitis, aphonia, cardio-vascular disease, cancer, Parkinson's and Alzheimer's diseases.

Miscellaneous uses

- ✧ Plant has potential for commercial exploitation in wastelands of cold desert areas of the Himalayas to increase income and employment to rural youths.
- ✧ Oil extracted from fruit is used in treating burns, sun burn and other skin diseases; in the preparation of anti-ageing and radio protective creams. The roots of the plant fix atmospheric nitrogen in the soil (non-leguminous nitrogen fixation) enabling plants adaptability to poor soils in erosion prone areas.

Phytochemicals

- ✧ The plant contains large number of bioactive substances like flavonoids (isorhamnetin, quercetin, myricetin, kaempferol and their glycoside compounds), carotenoids (β and δ - carotene, lycopene, zeaxanthin), few essential amino acids, sitosterol, triterpene, fatty acids, tannin acid, 5-hydroxytryptamine, umbelliferone, antioxidant vitamins and minerals.

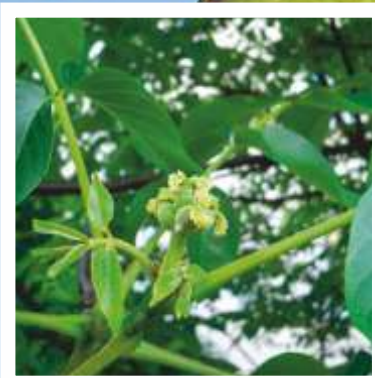
Unique value

Its juice being fibrous does not freeze at sub-zero temperature.

Nutritional profile

Constituents	Value (per 100g)
Proteins	0.35g
Total sugars	0.06g
Organic acid	0.04g
Sodium	4.12 mg
Potassium	149.99 mg
Calcium	38.30 mg
Iron	1.17 mg
Magnesium	4.77 mg
Zinc	0.09mg

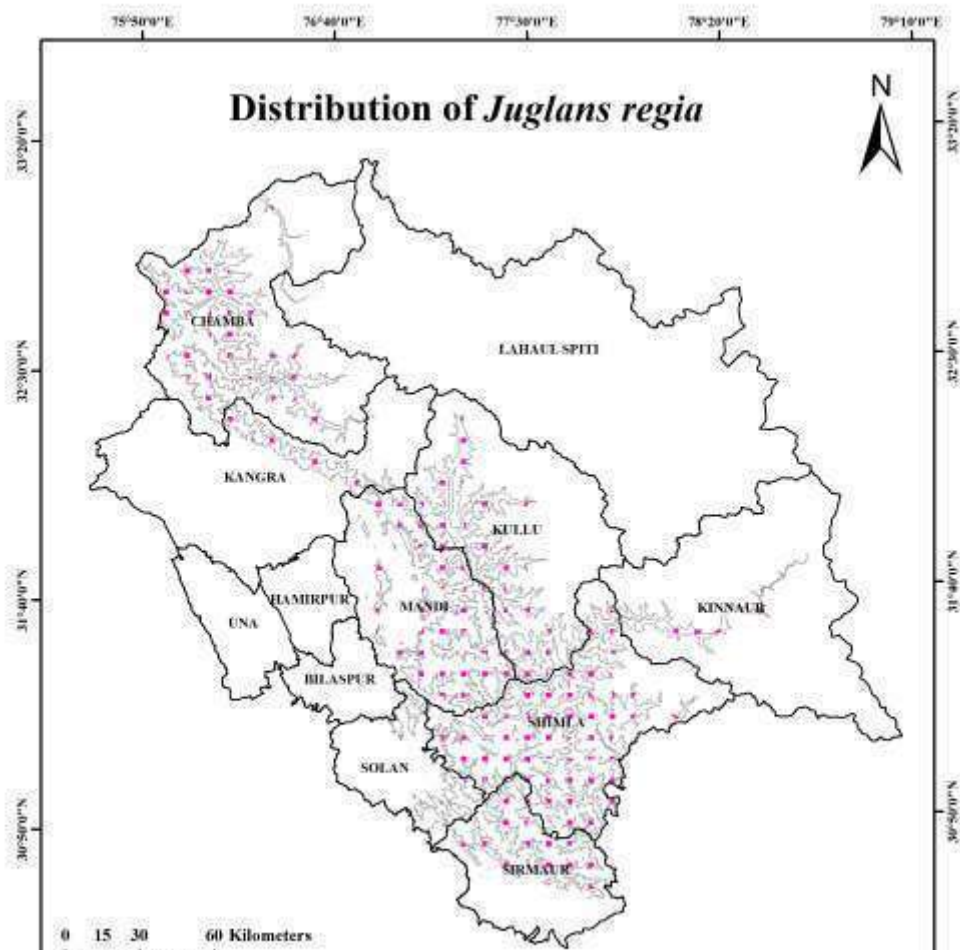
Juglans regia



Juglans regia L.

Wild Edible Fruits of Himachal Pradesh

Common name : Akhrot, Khod, Walnut
Family : Juglandaceae
Elevation : 1200-3000 m
Life form : Large tree
Flowering : February-April
Fruiting : July-September
Distribution : Walnut is native to Himalayas and Southwest China and is usually planted around localities but naturalized as an escape in forests. In Himachal Pradesh, it occurs in Chamba, Kullu, Mandi, Solan, Kinnaur, Bilaspur, Kangra, Shimla and Sirmaur districts.



Ethnobotanical Uses

- ⇒ Kernels are consumed as dry fruits and to garnish various cuisines and often mixed with roasted grains for consumption in winter seasons and is a source for edible oil.
- ⇒ The paste of kernels used as stuffing material in different steamed/fried preparation like *bhatura* and *siddu*.
- ⇒ Bark is used like toothbrush (*dandasa*) and bark/leaves for curing toothache.
- ⌘ Roots, bark and leaf are used as dye/hair colouring agent.
- ⌘ The leaves are used in scrofula, rickets and leucorrhoea.
- ⇒ The leaves are used as repellent in store grain bins to protect against pests.
- ⇒ Nuts are offered to deities on their arrival in localities during religious ceremonies.

Medicinal importance

- ⇒ Walnut husk directly applied to the skin for skin diseases, skin infections, and eyelid swelling.
- ⇒ In combination with other herbs, walnut husk is used to treat diabetes, stomach inflammation, anaemia.
- ⇒ The kernels are antilithic, diuretic and stimulant. These are used internally for remedy of low back pain, frequent urination, weakness of legs, chronic cough, asthma, constipation (due to dryness) or anaemia and stones in the urinary tract. The kernel paste is applied to areas of dermatitis and eczema.
- ⇒ The plant leaves are anthelmintic, anti-inflammatory, astringent and have detoxifying effects, and are also used for constipation, coughs, asthma, diarrhoea, dyspepsia *etc.* The leaves are used to cure skin ailments, purify blood, curing strumous sores and excessive sweating in the hands and feet.

Miscellaneous uses

- ⌘ Wood is used as timber for furniture and wood carving.
- ⌘ Trees are planted in farm boundaries and also for reclamation of waste lands.
- ⌘ The leaf extract has strong bactericidal activity against microorganisms.

Phytochemicals

- ⇒ Amino acids, ferulic acid, vanillic acid, omega-6, omega-3, juglone, barium, arsenic in traces, myricetin, syringic acid, coumaric acid, oleic palmitic, stearic, linoleic acid, linolenic acid and tocopherol.

Unique value

Walnuts are good source of polyunsaturated fatty acids (PUFA) (Omega-6 and Omega-3) and polyphenols which reduces the chances of coronary heart disease, different types of cancer and also have anti-inflammatory/anti-mutagenic properties.

Nutritional profile

Constituents	Value (per 100g)
Proteins	15.2 g
Carbohydrates	13.7 g
Fats	65.2g
Dietary fibre	6.7 g
Ascorbic acid	1.3 mg
Potassium	0.8 mg
Magnesium	1580 mg
Calcium	98.0 mg
Phosphorus	346.0 mg
Iron	2.9mg
Energy	6544 kcal

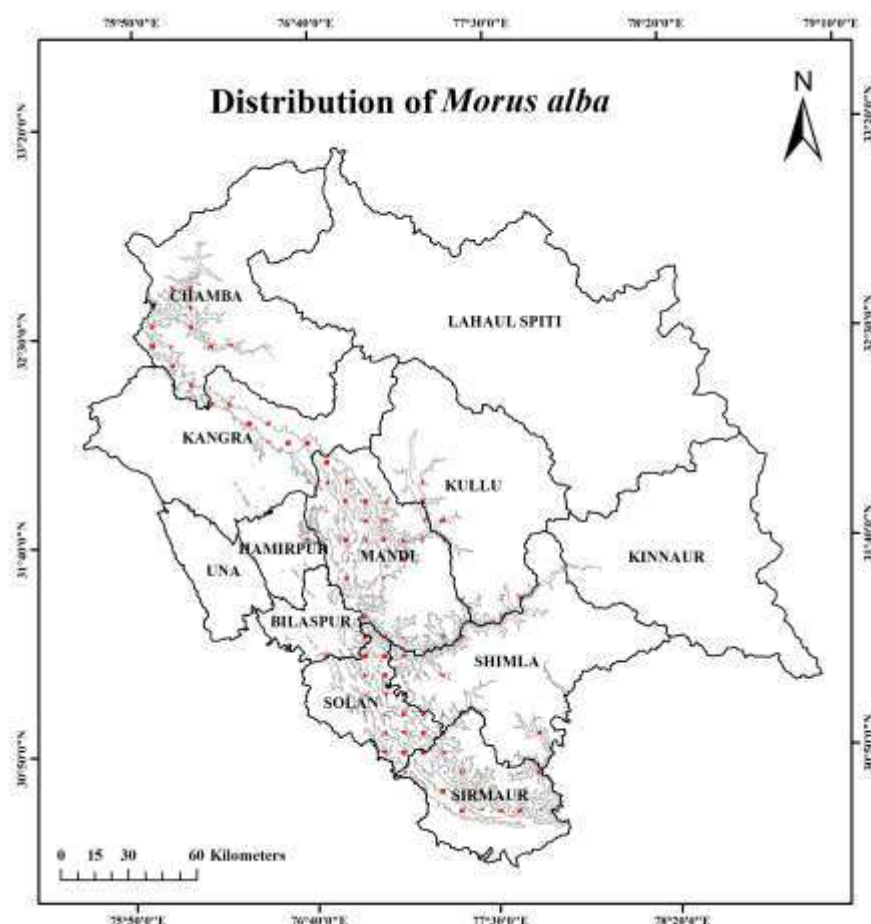
Morus alba



Morus alba L.

Wild Edible Fruits of Himachal Pradesh

Common name	: Shehtoot, Toot, Tutri, Chimu, White mulberry
Family	: Moraceae
Elevation	: Up to 1600 m
Life form	: Medium sized tree
Flowering	: March- April
Fruiting	: May-June
Distribution	: White mulberry is native to Northern Asia. It occurs in Kangra, Mandi, Chamba, Hamirpur, Bilaspur, Solan, Shimla, Una, Sirmaur and Kullu districts.



Ethnobotanical uses

- It is used for preparing jams or jelly and addition of lemon juice perks up the flavor.
- Mulberry leaves are food source for the silkworm larvae (*Bombyx mori*).
- Unripe fruit and green parts of the plant have a white sap which is mildly toxic, hallucinogenic and stimulating.

Medicinal importance

- The leaves are used to treat fever, inflamed eyes, sore throats, headache, dizziness, vertigo, elephantiasis and also have antibacterial, diaphoretic, hypoglycaemic properties.
- The fruit juice is used as a tonic for kidney functions, neurasthenia, hypertension and diabetes.
- The fruit is useful to prevent premature greying of the hair and to treat blurred vision and insomnia.
- Fruits are good source of vitamins and minerals.

Miscellaneous uses

- Tree has a medium canopy and can be planted as an avenue tree.
- It is a multipurpose tree and used as fodder, dye and for manufacturing hockey sticks, tennis and badminton rackets.

Phytochemicals

- Carotene, vitamin B1, folic acid, folinic acid, and vitamin D, n-butanol, beta-gamma-hexenol, methyl-ethyl acetaldehyde, n-butylaldehyde, iso-butylaldehyde, acetic, propionic and isobutyric acids and polyhydroxylated alkaloids.

Nutritional profile

Constituents	Value (per 100g)
Proteins	1.44 g
Carbohydrates	9.80 g
Total fats	0.39 g
Dietary Fiber	1.7 g
Potassium	194.0 mg
Calcium	39.0 mg
Copper	60.0 mg
Iron	1.85 mg
Magnesium	18.0 mg
Selenium	0.6 mg
Zinc	0.12 mg
Energy	43 Kcal

Unique value

Anthocyanins extracted from fruits are attractive natural water soluble colors used in food items.

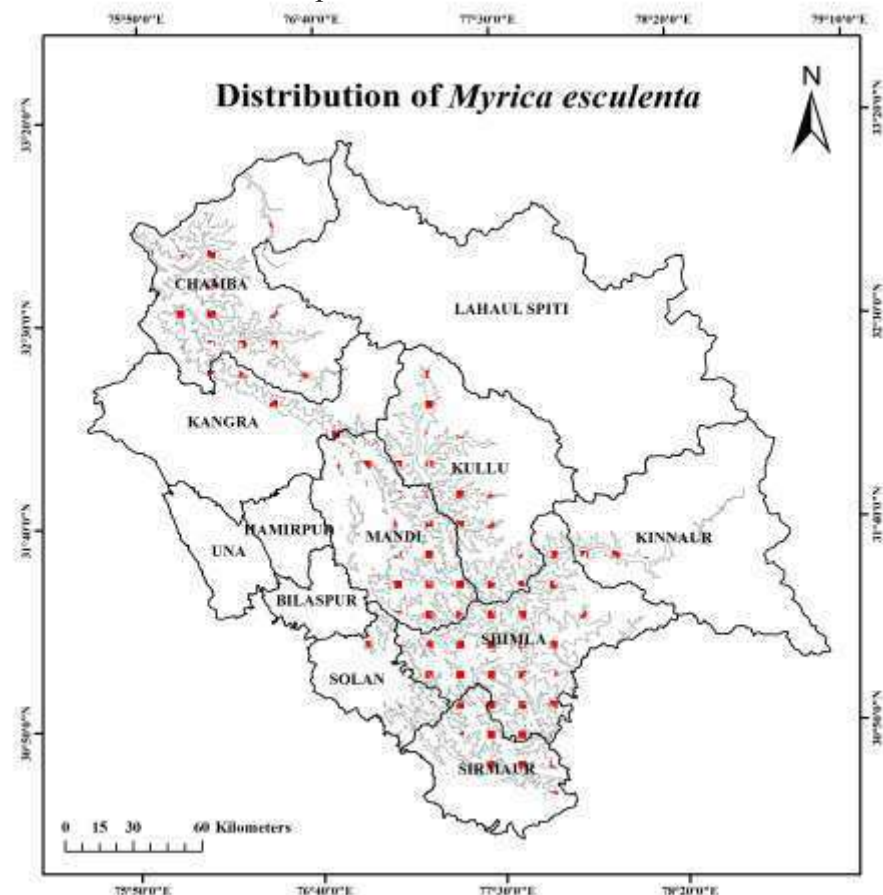
Myrica esculenta



Myrica esculenta Buch-Ham.ex D. Don

Wild Edible Fruits of Himachal Pradesh

Common name	: Kaphal, Kaiphal, Box Myrtle
Family	: Myricaceae
Elevation	: 1200-2000 m
Life form	: Medium sized tree
Flowering	: February-April
Fruiting	: May-June
Distribution	: Kaphal is native to Northern India. In Himachal Pradesh this plant occurs in sub-tropical to sub-temperate areas.



Medicinal importance

- Its fruit is a good natural antioxidant.
- The decoction of bark and leaves is the best panacea for bronchial asthma, cough and sinusitis.
- The bark of the plant also have some unique properties to cure diseases like; cardiac debility, gonorrhoea, haemoptysis, epilepsy, edema, dysentery, typhoid and hypothermia.
- In Ayurveda, it is described as a detoxifier, pain killer and healing herb.
- The seed oil is useful for massage in bodyache and used to treat ear discharge.
- An effective ayurvedic preparation, *Kaas-Har Churna* is also prepared from this plant which is used in cough and cold.
- Anti-inflammatory activity is found in *Myrica esculenta* bark due to the presence of flavanoids and steroids.

Miscellaneous uses

- Fruits collected from forest are sold in the local market and serve as a source of extra income for rural youths.
- The tree has good potential for avenue plantations.

Phytochemicals

- Alkaloids, carbohydrates, flavonoids, saponins, sterols, tannins and triterpenoids, gallic acid, castalagin, myricanol, myricanone, epigallocatechin, proanthocyanidin, catechine, delphinidine chloride, myricanol, quercetin, β -sitosterol, taraxerol and triterpenediol.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	76.60
Proteins	1.30g
Carbohydrate	16.13g
Fibres	3.40g
Fats	0.02g
Ash	1.25g
Potassium	1.98mg
Calcium	1.0mg
Magnesium	8.40mg
Energy	123.79 Kcal

Unique value

Presence of myricetin in the plant improves heart health by preventing low density lipoprotein oxidation.

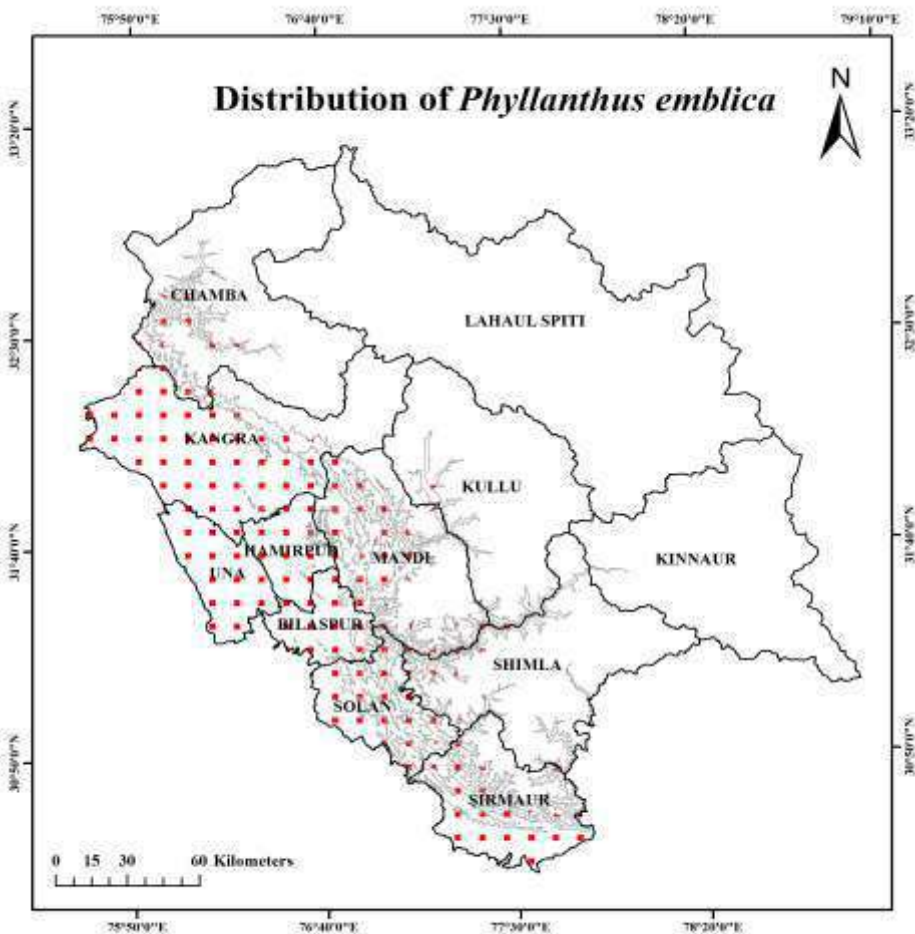
Phyllanthus emblica



Phyllanthus emblica L.

Wild Edible Fruits of Himachal Pradesh

Common name	: Aonla, Amla, Indian gooseberry
Family	: Phyllanthaceae
Elevation	: 700-1600 m
Life form	: Medium sized tree
Flowering	: April-May
Fruiting	: December- March
Distribution	: This plant is native to India and occurs from sub-tropical to sub-temperate areas of Himachal Pradesh.



Ethnobotanical uses

- ✦ Fruit is edible and eaten as fresh, pickled or preserved as *murabba*.
- ✦ *Aonla* is considered a sacred plant in Hindu religion, it is believed that God Vishnu dwell in it and it is used in *yajnas*/cremation rituals.
- ✦ Dried fruit powder is one of the component of Triphala *i.e.* an Ayurvedic formulation consisting of dried and powdered fruits of three plants *Viz.*, Amla, Bahera and Harad generally in equal proportions which is a traditional medicine in *Charaka* and *Sushruta Samhita*, the foundational text of Ayurveda.
- ✦ This is used to stimulate hair growth by nourishing the hair/scalp and preventing premature greying.
- ✦ The high tannin content of *aonla* is also used as a dye in inks, shampoos and hair oils.

Medicinal importance

- ✦ In Ayurveda, amla is considered to be a potent rejuvenator and immuno-modulator effective in stalling degenerative processes/ senescence and to promote longevity, enhance digestion, treat constipation, reduce fever and cough, alleviate asthma, strengthen the heart, benefit the eyes, stimulate hair growth, enliven the body, enhance intellect and suppresses cancerous cells.
- ✦ Amla fruit is widely used in the Indian system of medicine as alone or in combination with other plants and is used to treat common cold and fever, as diuretic, laxative, liver tonic, refrigerant, stomachic, restorative, anti-pyretic, hair tonic and to prevent ulcer and dyspepsia.
- ✦ Amla is also stated to have hepato, cardio, nephro and neuroprotective effects; antioxidant, anti-inflammatory, analgesic, antipyretic and restorative properties.

Miscellaneous uses

- ✦ Major component of *Chayavanprash*, an important ayurvedic health promoting formulation.
- ✦ It can be a component for diversification of orchard crops.
- ✦ Collection of fruits from forests provides an extra income and employment to the rural youths.

Phytochemicals

- ✦ Phytochemicals contain phenols, including ellagic acid, gallic acid, quercetin, kaempferol, corilagin, geraniin, furosin, gallotanins, emblicanins, flavonoids, amino acids, vitamin C, elavanoid, chebulinic acid, trigallayl glucose and pectin. glycosides, and proanthocyanidins. The roots contain glycosides and tannins.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	86.0
Proteins	1.0 g
Carbohydrates	10.0 g
Total fats	0.5 g
Vitamin C	478.0 mg
Vitamin E	0.2 mg
Niacin	0.3 mg
Vitamin B ₆	0.1 mg
Pantothenic Acid	0.3 mg
Omega 3 fatty acids	48.0 mg
Omega 6 fatty acids	276.0 mg
Energy	48 Kcal

Unique value

Amla is virshya herb and has a positive effect on seven dhatus of human body including the digestive, excretory, circulatory, reproductive, respiratory and nervous system and supposed to be a divine herbal supplement to mankind.

Physalis peruviana



Physalis peruviana L.

Wild Edible Fruits of Himachal Pradesh

Common name : Rasbhary, Cape gooseberry

Family : Solanaceae

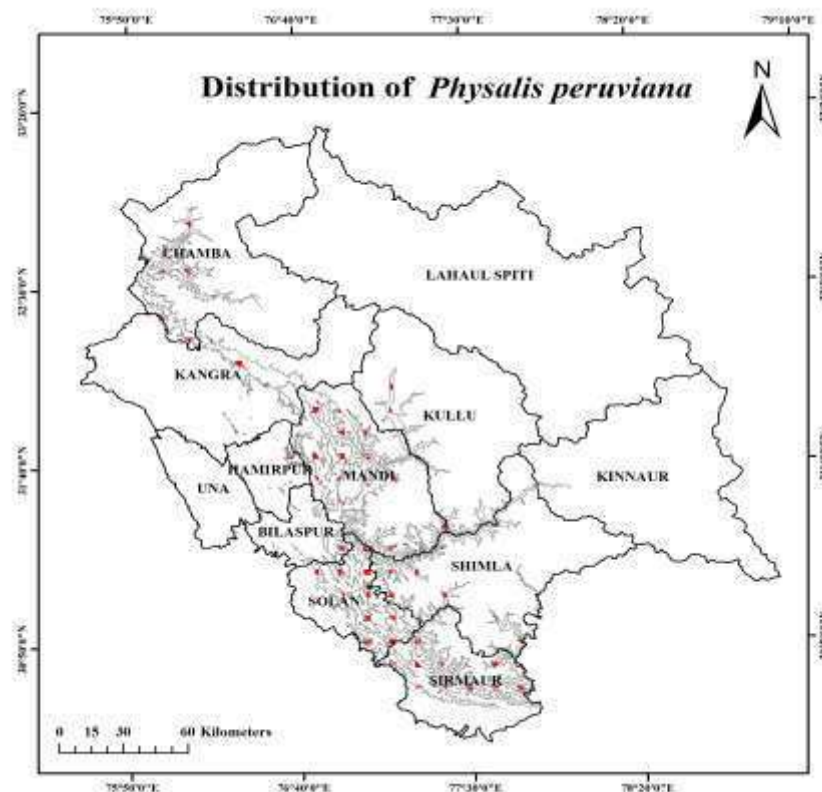
Elevation : Up to 1650 m

Life form : Perennial herb

Flowering : August-October

Fruiting : August-November

Distribution : This plant is native to Brazil but became naturalized in tropical to sub-tropical regions of the world. In Himachal Pradesh the plant is distributed in tropical and sub-tropical areas.



Ethnobotanical uses

- ⇒ Fruit has pleasant flavour like cherry tomato at maturity and eaten as raw/cooked.
- ⇒ The pounded leaves are used as a remedy for headache and itches. The juice of the leaves, mixed with mustard oil and water has been used as a remedy for earache.
- ⇒ An extract of the root is taken for fever and applied as a poultice to the lower abdomen in order to subside pain.
- ⇒ The root is chewed and acts as a vermifuge whereas the decoction of the roots is used to treat hypertension and diabetes.

Medicinal importance

- ⇒ The plants of *Physalis peruviana* are bitter, appetizing tonic, diuretic, laxative, and useful in inflammations, enlargement of the spleen and abdominal troubles.
- ⇒ Extracts from the plant have shown anticancer activity.
- ⇒ The fruit of *Physalis* possess polyphenols and carotenoids, which has hepatoma properties and prescribed against lung cancer and leukemia.

Miscellaneous uses

- ⌘ This plant is a suitable crop for non-competitive land use systems.

Phytochemicals

- ⇒ Alkaloids, anthraquinones, flavonoids, cardiac glycosides, phenols, quinones, reducing sugars, saponins, steroids, starch, tannin and terpenoids.

Nutritional profile

Constituents	Value (per 100g)
Carbohydrates	11.2 g
Fats	0.7 g
Proteins	1.9 g
Vitamin A	0.11 mg
Riboflavin	0.04 mg
Niacin	2.8 mg
Vitamin C	11.0 mg
Calcium	9.0 mg
Iron	1.0 mg
Phosphorus	40.0 mg
Energy	53.0 kcal

Unique value

The fruit of *Physalis* contains very high iron (38mg/100g fruit pulp) and can satisfy the daily need of a person.

Pinus gerardiana



Pinus gerardiana Wall. ex D. Don

Wild Edible Fruits of Himachal Pradesh

Common name : Chilgoza, Neoza, Ree, Miri, Chilgoza pine

Family : Pinaceae

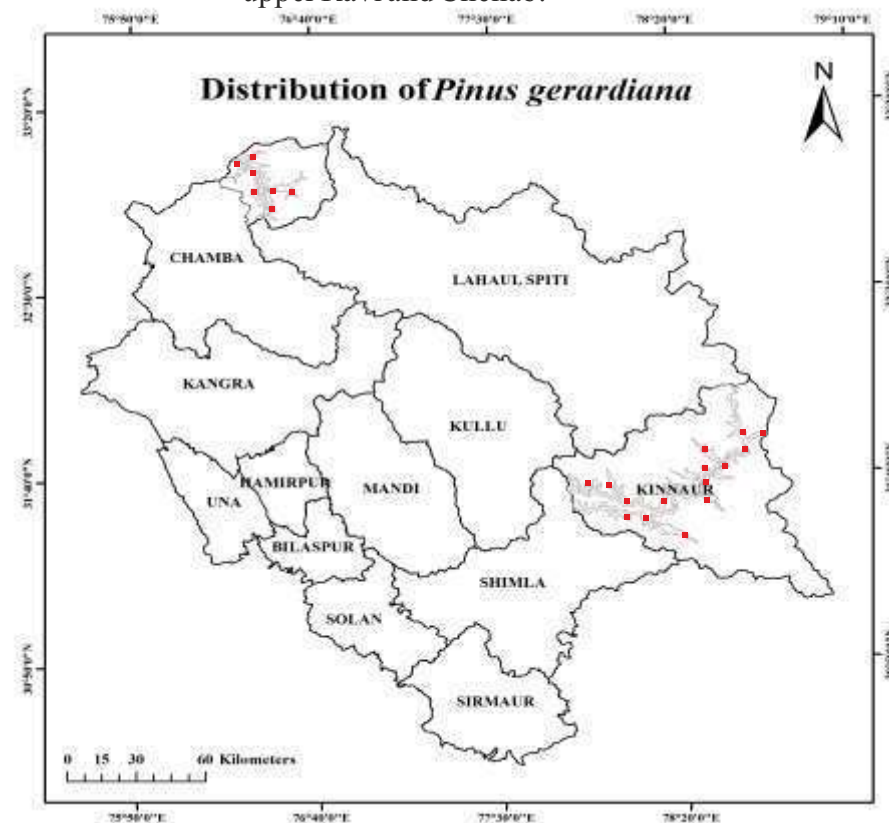
Elevation : 1800-3300 m

Life form : Large tree

Flowering : March-May

Fruiting : September-May

Distribution : Chilgoza pine is native to Asia (Native to north-western Himalayas) has a specific ecological distribution and only restricted to the north-western Himalayas in eastern Afghanistan and Pakistan. In Kinnaur it predominantly occurs on the banks of river Sutlej while in Pangi (Chamba) on the banks of upper Ravi and Chenab.



Ethnobotanical uses

- ✦ The edible seeds known as *chilgoza* are nutritive and eaten raw as well as roasted.
- ✦ Garland of *chilgoza* nuts are used for greeting guests in the tribal area of Kinnaur on special occasions.

Medicinal uses

- ✦ The kernels are useful as carminative, stimulant, analgesic and as expectorant.
- ✦ Chilgoza is energetic, carminative, stimulant and expectorant.
- ✦ Seed oil is used for wound dressing and ulcers.

Miscellaneous uses

- ✦ *Chilgoza* are non-timber forest products thus benefits local community through financial gains
- ✦ The tree bark, wood, leaves and cones are resinous and produce oleoresins. Oleoresins can be obtained by tapping tree bark, however it is not produced in large quantities.

Phytochemicals

- ✦ Fatty acids like palmitic acid, stearic acid, oleic acid, linoleic acid, carbohydrates, minerals chiefly calcium, phosphorus and iron are present in the kernels.

Nutritional profile

Constituents	Value (per 100g)
Carbohydrates	13.08g
Proteins	13.69 g
Total fats	68.37g
Dietary fibre	3.70g
Energy	673 Kcal

Unique value

Chilgoza pine nuts are also a very rich source of fat. Out of total fat present, 90% of the fat is unsaturated (healthy fat), 51% is linoleic acid and 37% oleic acid.

Prunus armeniaca



Prunus armeniaca L.

Wild Edible Fruits of Himachal Pradesh

Common name : Chuli, Shada, Shadi, Zardalu, Wild apricot

Family : Rosaceae

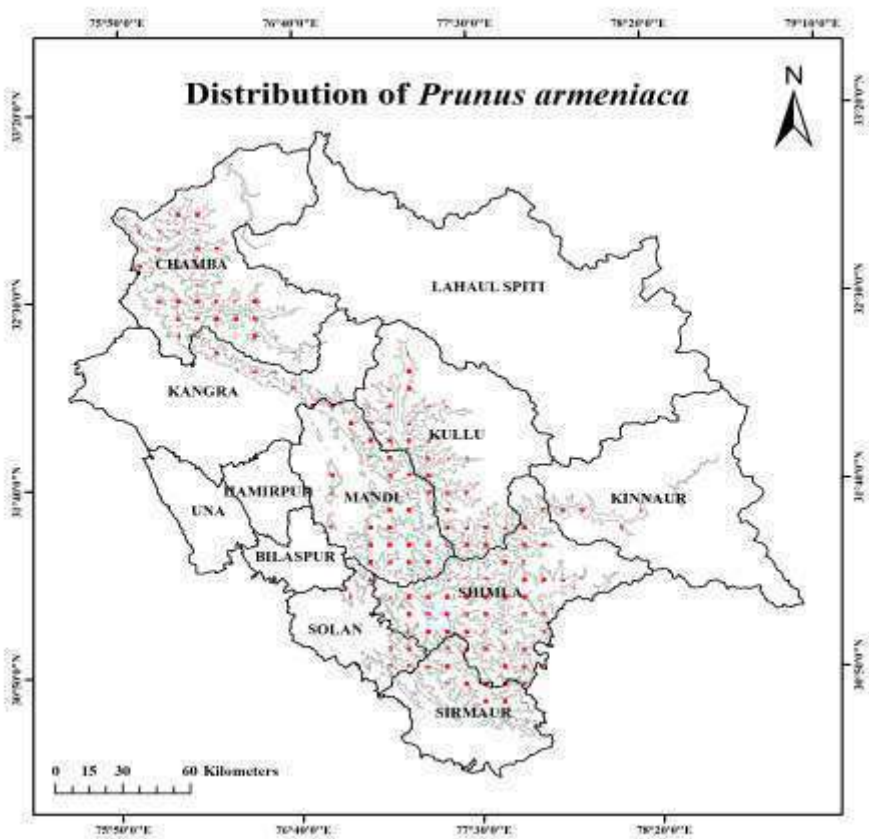
Elevation : 1200-2500 m

Life form : Medium sized tree

Flowering : March-April

Fruiting : May-August

Distribution : *Chuli* is native to East Asia and occurs in sub-temperate to temperate parts of the State.



Ethnobotanical uses

- Fruit edible, preserved as sundried sliced fruits (*Chilori/Shikori*) and used for making jams/chutney and alcoholic drinks.
- Apricot kernels are important source of oil (44.3% recovery) which is edible and used for cooking, application on hair, massage and additive in different cosmetics and its cake as hair shampoo.
- Apricot kernels are bitter as well as sweet in taste the latter one are used as dry fruits.

Medicinal importance

- The seeds (kernels) possess antioxidant, anti-asthamic, antitussive and anti-spasmodic activity. It is also used as antidote, an expectorant, tonic and anthelmintic.
- The seed oil is anti- inflammatory and reduces arthritis and gives relief from the pain.
- The oil is helpful in maintaining the immune system and strengthens the body's ability to fight infections such as cold and flu.

Miscellaneous uses

- The wood is hard, durable and is used for making agricultural implements, thatching mud houses, as fuel, woodcarving and making furniture.
- Apricot kernel oil contains high fatty acids, vitamin E and A which is used to moisturize and nourish dry mature skin. It is an ingredient in cosmetics like creams, soaps, and skin lotions.
- The seedlings of *chuli* tree are used as rootstock for the commercial cultivars of apricot, peach, almond and plum, which have high adaptability in different soil types.

Phytochemicals

- Tocophenols, phenolic compounds, myristic, palmitic, stearic, oleic and linoleic acids, polysaccharides, poly phenol, fatty acids and sterol derivatives, carotenoids, cyanogenic glycosides and volatile compounds.

Nutritional profile

Constituents	Value (per 100g)
Fats	42.2g
Proteins	23.8g
Fibre	15.1g
Carbohydrates	11.2g
Vitamin C	10.0 mg
Vitamin K	3.3mg
Zinc	0.2mg
Phosphoric acid	23.0mg
Potash	259.0mg

Unique value

The kernel contain laetrile (vitamin B₁₇), which helps in the treatment and prevention of cancer and regulates

Punica granatum



Punica granatum L.

Wild Edible Fruits of Himachal Pradesh

Common name : Darhu, Wild pomegranate

Family : Punicaceae

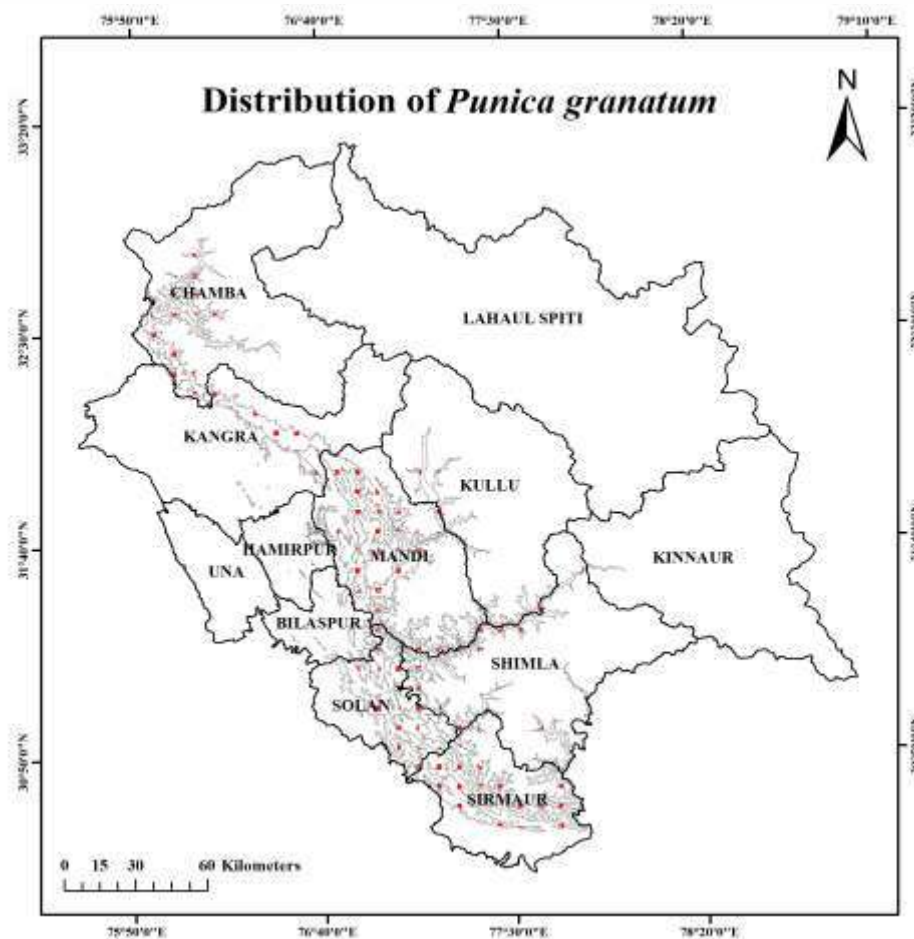
Elevation : 900-1800 m

Life form : Small tree

Flowering : April-May

Fruiting : August-September

Distribution : Wild pomegranate is distributed from Iran to Northern India and occurs in subtropical to sub-temperate dry slopes of Himachal Pradesh.



Ethnobotanical uses

- ✦ The major use of wild pomegranate is for making *Anardaana* (dried arils), which is used in making chutney and as a souring agent in various preparations.
- ✦ The dried fruit rind is astringent and used in diarrhoea and dysentery. It also yields a fast yellow dye, which is used as hair dye and dying cloth.
- ✦ The wood of the tree is very hard and durable. It is generally used for making agricultural implements.

Medicinal importance

- ✦ The juice of fresh leaves and young fruits are used for the treatment of dysentery.
- ✦ The powdered bark is given for expelling roundworms.
- ✦ Ripe fruits are tonic, laxative and enrich the blood. They are also useful in sore throat, sore eyes and brain diseases and chest troubles.
- ✦ The bark is used to expel tapeworms.
- ✦ Flower buds are used in bronchitis.

Miscellaneous uses

- ✦ Plantation of wild pomegranate is a viable option for promoting diversification in orchard crops.

Phytochemicals

- ✦ Triterpenoids, steroids, glycosides, flavonoids, tannins, carbohydrate & Vitamin C. The three different extracts from whole fruit were found to contain triterpenoids, steroids, glycosides, saponins, alkaloids, flavonoids, tannins, carbohydrate and vitamin C. the three different extracts from seeds were found to contain triterpenoids, steroids, glycosides, saponins, alkaloids, tannins, carbohydrate & Vitamin C.

Unique value

Certain ellagitannin compounds (granatin B and punicalagin) are abundant in the wild pomegranate juice which is effective in reducing heart-disease risk factors by scavenging harmful free radicals from the human body.

Nutritional profile

Constituents	Value (per 100g)
Sugars	10.01g
Reducing Sugars	8.87g
Non-reducing Sugars	1.08g
Vitamin C	36.62 mg
Minerals	7.50mg
Phosphorus	0.10mg
Potassium	0.48 mg
Calcium	0.031mg
Magnesium	0.32mg

Prunus mira



Prunus mira Koehne.

Wild Edible Fruits of Himachal Pradesh

Common name : Behmi, Smooth pit peach

Family : Rosaceae

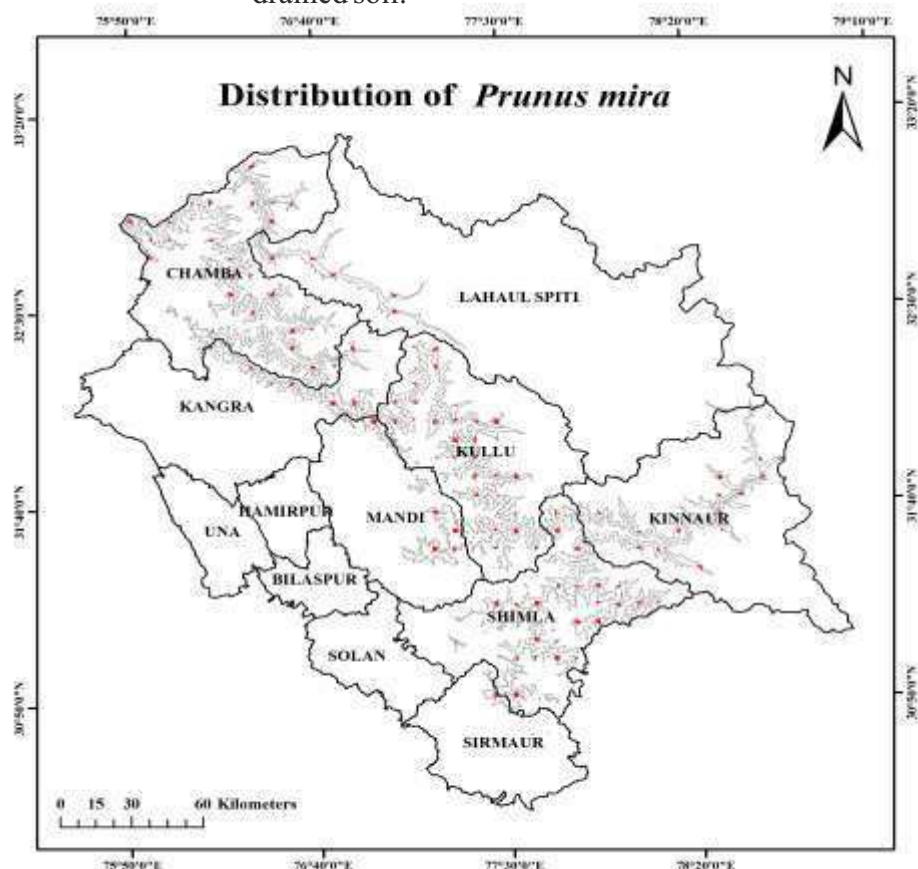
Elevation : 2000 to 3500 m

Life form : Small tree

Flowering : March- April

Fruiting : August- September

Distribution : This plant is found wild in the forests of dry temperate region of the western Himalayas, Bhutan, Tibet and west China. In Himachal Pradesh, it is distributed in Kinnaur, Chirgaun area of Shimla and sparsely distributed in Manikaran, Udaipur and Pangi valleys. The plants of behmi prefer light sandy, loamy well drained soil.



Ethnobotanical uses

- Behmi fruits, though a bit sour but eaten and kernels are added in sweet dishes as a substitute for almond.
- These are also sun dried and used later for making a hard alcoholic liquor that is quite popular with local tribesmen.
- Oil is also extracted from kernels. This oil is used for cooking as well as hair oil.
- The wood used as timber and for making agricultural implements.
- A massage with behmi oil is recommended for patients suffering from disorders of joints.

Medicinal importance

- The plant contains amygdalin and prunasin substances which break down in water to form hydrocyanic acid (cyanide or pruccic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of wellbeing.

Phytochemicals

- The fruit contains various phytochemicals viz., vitamin C, calcium, and ferrum, fatty acids; oleic acid, linoleic acid, cetylic acid, and octadecanoic acid.

Nutritional profile

Constituents	Value (per 100g)
Total Soluble Solids	10.94 g
Total Sugar	4.83 g
Acidity	2.03 g
Reducing Sugars	2.02 g
Non-reducing Sugar	2.67 g



Unique value

Seedlings of this species are commonly used as rootstock for almond, peach and plum.

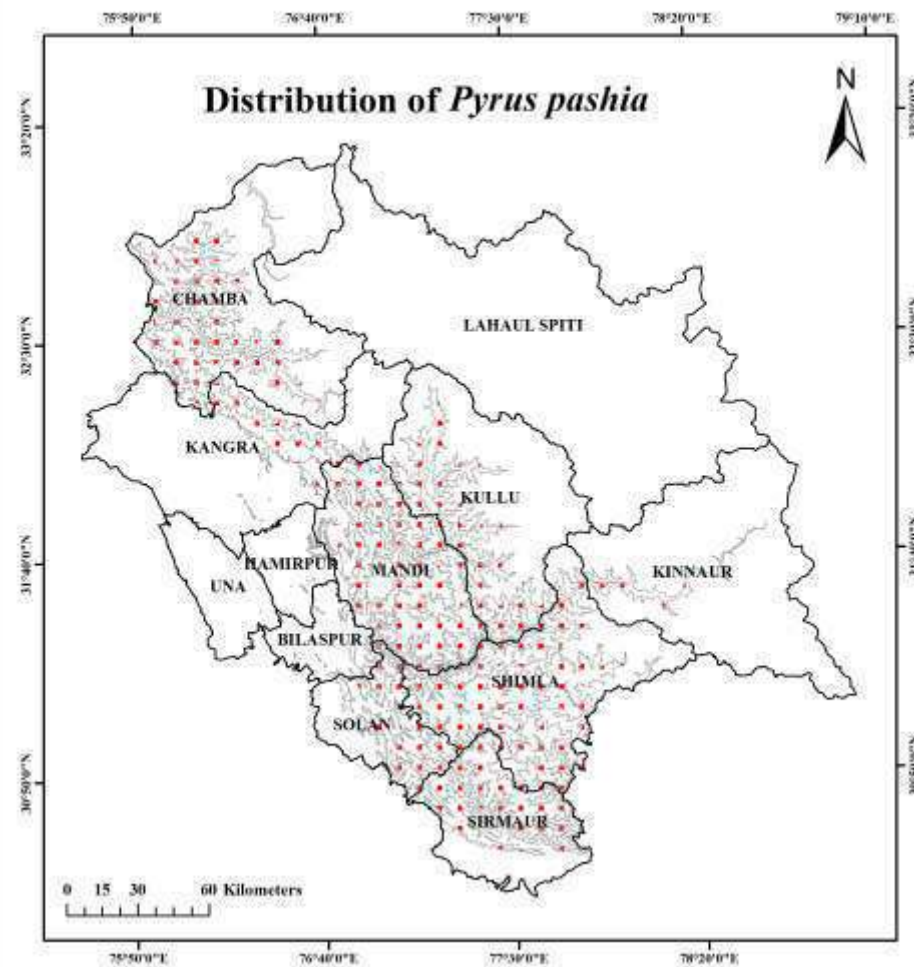
Pyrus pashia



Pyrus pashia Buch.-Ham. ex D.Don

Wild Edible Fruits of Himachal Pradesh

Common name : Shegal, Kainth, Mehal, Wild Himalayan Pear
Family : Rosaceae
Elevation : 900-2700 m
Life form : Small tree
Flowering : February-March
Fruiting : July-September
Distribution : Himalayan pear is native to Southern Asia and occurs in sub-tropical to temperate areas of the Himachal Pradesh.



Ethnobotanical uses

- ⇒ Fruits are best to eat when these are fully matured and have a grittier texture.
- ⇒ Decoctions containing dried fruits with other plant parts are used for improvement in spleen and stomach functions.
- ⇒ The fruit is added to cattle feed to enhance milk production.

Medicinal importance

- ⇒ The fresh leaves are known to possess astringent, febrifuge, laxative and sedative properties and crushed leaves are used to improve cosmetic appearance by staining palms, feet and nails.
- ⇒ Fruit juice is astringent and diuretic and is used to treat dysentery, leishmaniasis, eye problems, digestive disorder, sore throat, irritability, abdominal pain, anaemia.
- ⇒ Fruits have antimicrobial, antioxidant, stomachic and hypoglycemic activities.
- ⇒ The barks of tree possess astringent, laxative, anthelmintics and febrifuge properties and is used traditionally for the treatment of digestive disorders, sore throat, fever, peptic ulcer, gastric ulcer and typhoid fever.

Miscellaneous uses

- ⇒ Plantation of *kainth* as pollinizer or fixing flower bouquets in pear orchard is done to promote pollination which enhances fruit setting in commercial varieties.
- ⇒ The wood is very hard and used for making agriculture implements and good source of fuel wood/coal.

Phytochemicals

- ⇒ Fruits possess metabolites like alkaloids, flavonoids, steroids, and tannins, lupeol, β -sitosterol, β -sitosterol— β -D-glucoside. Leaves contain arbutin, tannins, phlorhizin, pectin and amygdalin, chlorogenic acids, flavan-3-ols and arbutin.

Nutritional profile

Constituents	Value (per 100g)
Sugars	6.80g
Proteins	3.70g
Ash	1.00 g
Pectin	0.40g
Vitamin C	1.20 mg
Phosphorus	0.03mg
Potassium	0.48mg
Calcium	0.06mg
Magnesium	0.03mg
Iron	0.01 mg

Unique value

Seedlings raised from seeds of *P. pashia* var. *kumaoni* are used as rootstock for commercial varieties. It possesses profuse deep root system and resistance to white root rot disease.

Ribes alpestre



Ribes alpestre Wall. ex Decne.

Wild Edible Fruits of Himachal Pradesh

Common name : Chalendra, Pilikcha, Ghuspi, Asian gooseberry
Family : Grossulariaceae
Elevation : 2400-3600 m
Life form : Shrub
Flowering : May-June
Fruiting : August -September
Distribution : This plant is native to Asia and in Himachal Pradesh, it occurs in temperate parts.

Ethnobotanical uses

- Ripe fruits are eaten as raw, cooked like vegetables, salads, spices, chutneys, herbal tea, home-made alcoholic drinks and soup.
- It can be made into jams, jelly, sauces, soft drinks and wine.
- Root powder mixed with tobacco is used as “Naswar”.
- The plant is burnt and the ashes are applied against the rabies infections.
- It is also used as broom to clear up the snow in cold desert areas of the state.

Medicinal importance

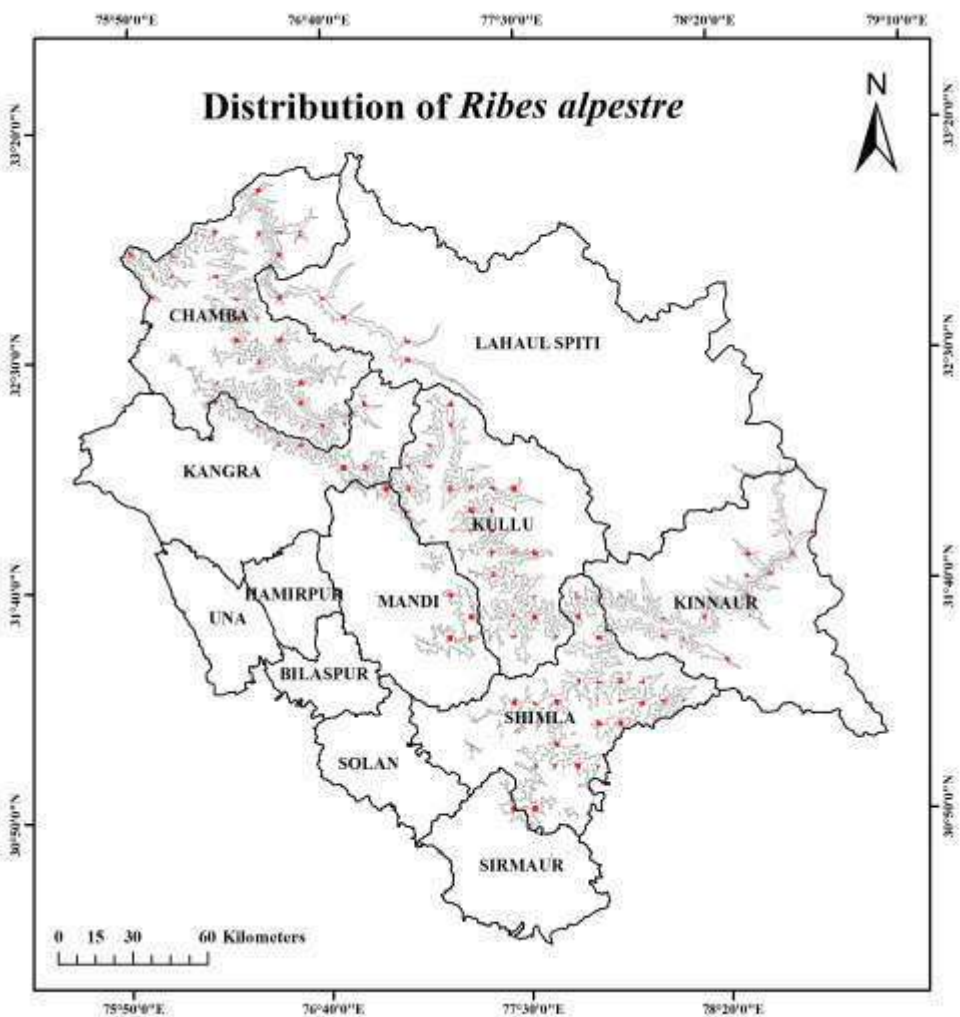
- The dried pulverized roots mixed with butter is used as ointment on abscess/boils.
- It is also given to cows in case of Chanjur disease.
- Roots are used for backache and joints pain and fruits are used for jaundice and liver problems.
- It has anti-inflammatory properties.

Miscellaneous uses

- It is planted as dense hedges or green fence and farm boundaries.
- The whole plant is highly toxic and skin contact may cause numbness.

Nutritional profile

Constituents	Value(per 100g)
Moisture%	46.64
Proteins	5.32g
Fibres	16.96g
Fats	0.65g
Carbohydrates	27.09g
Vitamin C	0.09g
Ash	3.70 g
Calcium	1.35 mg
Magnesium	0.90 mg
Nitrogen	0.85 mg
Potassium	2.11 mg
Phosphorus	0.28 mg



Unique value

The raw fruit is particularly rich in vitamin C and polyphenols.

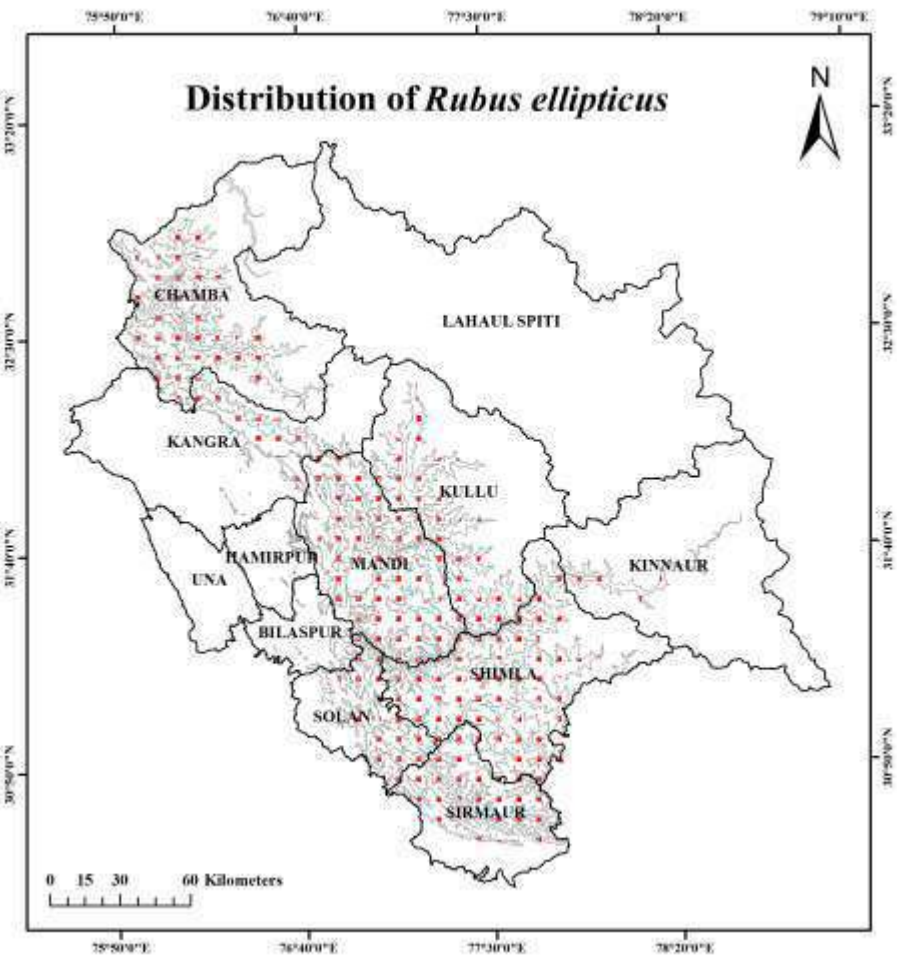
Rubus ellipticus



Rubus ellipticus Sm.

Wild Edible Fruits of Himachal Pradesh

- Common name** : Aakhe, Acche, Hinure, Hisra, Heer, Hisalu, Yellow Himalayan Raspberry
- Family** : Rosaceae
- Elevation** : 800-2400 m
- Life form** : Shrub
- Flowering** : January-April
- Fruiting** : May-June
- Distribution** : Golden Himalayan raspberry is native to India and south Asia. It occurs in sub-tropical to temperate areas of Himachal Pradesh.



Ethnobotanical uses

- ⇒ Fruit are sweet in taste, have some acidity and are eaten raw.
- ⇒ A decoction of the root, combined with *Girardinia diversifolia* root and the bark of *Lagerstroemia parviflora*, is used in the treatment of fevers.
- ⇒ The juice of the root is used in the treatment of fever, gastric troubles, diarrhoea and dysentery.
- ⇒ Juice prepared from leaf buds, mixed with *Centella asiatica* and *Cynodon dactylon*, are used in the treatment of peptic ulcers.
- ⇒ Nectar is derived from the blossom and it is a valuable honey plant.

Medicinal importance

- ⇒ The plant is astringent and febrifuge
- ⇒ The fruit of the plant is a potential source of anti-fertility drugs.
- ⇒ The fruit has counteracting effect to toxins, eliminates inflammation, relieves pain and arresting haemorrhage.
- ⇒ The fruits are rich in malic acid, citric acid and tartaric acid.
- ⇒ Roots and young shoots are used in colic pains.

Miscellaneous uses

- ⇒ The plant is traditionally grown as living fences that helps in stabilizing slide prone barren/infertile slopes and checking soil erosion.
- ⇒ Collected fruits are sold in local markets which contributes extra income to rural people.
- ⇒ The root cortex of *R. ellipticus* reportedly contains more than 40% tannin that could be used for tannin extraction.

Phytochemicals

- ⇒ Alkaloids, tannins, phenolic compounds, quinone, saponins, flavonoids, flavones, glycosides, carbohydrates, terpenes, triterpenes and proteins.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	64.4
Proteins	3.7 g
Fats	0.9g
Soluble Carbohydrates	27.1g
Vitamin C	1.1 mg
Fibre	2.4 g
Ash	1.3g
Total Nitrogen	0.6 g
Calcium	0.9mg
Potassium	1.8mg
Phosphorus	0.2mg
Magnesium	5.6 mg

Unique value

The plant establishes quickly after forest fires and forms nearly impenetrable thickets, which provides excellent cover for wildlife as well as nesting sites for small birds.

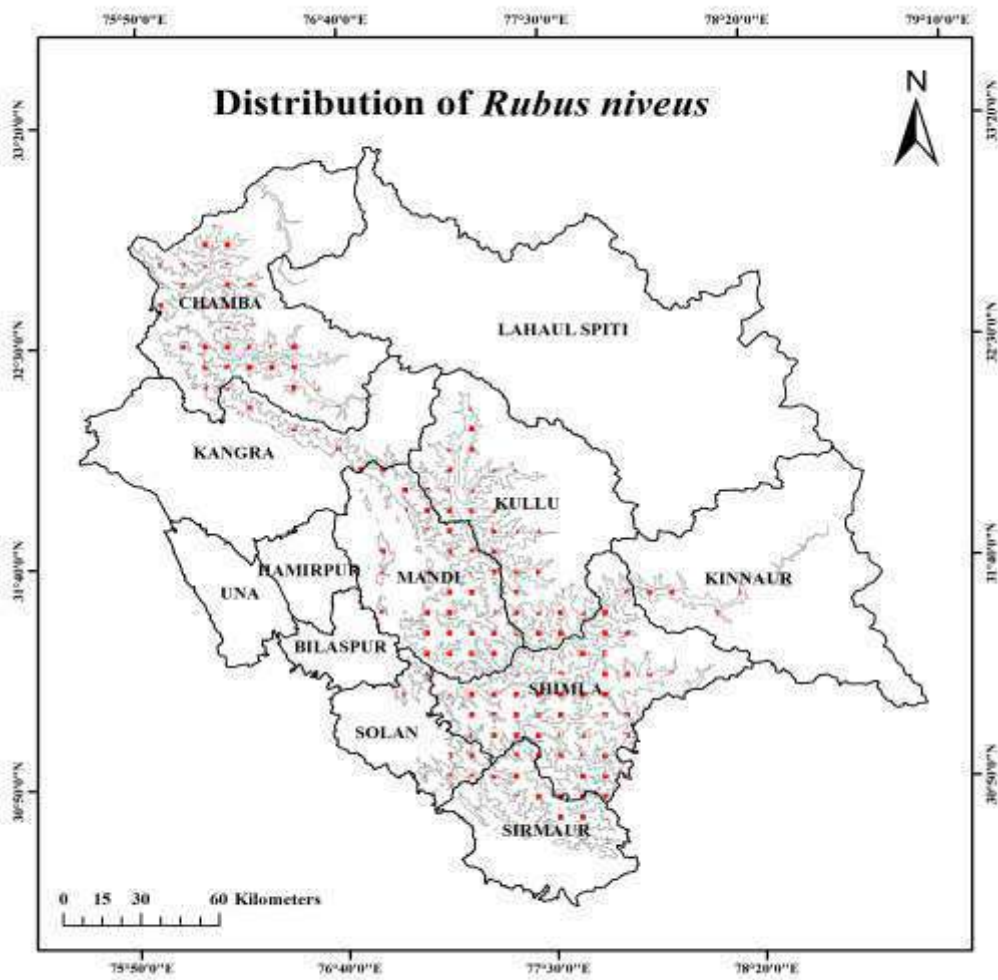
Rubus niveus



Rubus niveus Thunb.

Wild Edible Fruits of Himachal Pradesh

Common name	: Akhe, Achhe, Kala Hinsalu, Hill Raspberry
Family	: Rosaceae
Elevation	: Up to 3000 m
Life form	: Shrub
Flowering	: May-June
Fruiting	: August-September
Distribution	: The plant is distributed in sub-tropical to temperate areas of Himachal Pradesh.



Ethnobotanical uses

- ⇒ Fruits of *R. niveus* are eaten raw and mildly sweet with a smooth flavour.
- ⇒ The berries are often used in variety of desserts and jams.
- ⇒ Fruits may be used to produce a purple-dull blue dye.
- ⇒ In India, the root tips are made into small pills which help cure excessive bleeding during the menstrual cycle and may also be used to treat dysentery and diarrhoea.

Medicinal importance

- ⇒ Roots of this plant have anti-inflammatory, analgesic and antipyretic activities.
- ⇒ These extracts also act as an antioxidant and have the potential to help treat skin diseases, wounds and tumours.

Miscellaneous uses

- ⇒ The plant is used to create hedges and is also traditionally grown as living fences and can be the grown as ornamental shrub.
- ⇒ The plant is used in breeding programmes because of its vitality and resistance to leaf spot disease.

Nutritional profile

Constituents	Value (per 100g)
Proteins	3.3 g
Carbohydrates	85.2 g
Lipids	1.1 g
Fibres	5.7 g
Ash	4.2 g
Iron	3.3 mg
Zinc	8.1 mg
Copper	1.1 mg
Lead	0.2 mg
Manganese	2.4 mg
Chromium	0.1 mg
Energy	364.4 kcal

Unique value

Extracts and juices from the fruits have been used as an antidote for snake bites and are also used in ethno-veterinary medicine as a tonic during pregnancy.

Solanum nigrum



Solanum nigrum L.

Wild Edible Fruits of Himachal Pradesh

Common name : Kali Makoi, Giwali, Ghyain, Black Nightshade
Family : Solanaceae
Elevation : Up to 2400 m
Life form : Herb
Flowering : April-May
Fruiting : July-November
Distribution : Black nightshade is native to Eurasia. It usually grows as a weed in dry subtropical to temperate areas of Himachal Pradesh.

Ethnobotanical uses

- Leaves, shoots and ripened fruits are edible. Young leaves and new shoots are eaten raw or cooked like spinach. Ripened black berries are used in making jam.
- Chewing leaves helps in curing mouth ulcers whereas leaf decoction is used to reduce fever.
- Paste of the plant is applied on burns for quick healing.
- The mashed green berries are locally applied for treating ringworms.
- A quarter cup of leaf juice taken thrice a day helps to relieve painful periods.
- The juice from its roots is used against cough and cold.

Medicinal importance

- The plant possess potential central nervous system depressor activity, a promising drug candidate for the treatment of anxiety-like disorders.
- It is considered good for cancers of digestive system.
- It is good for reducing inflammations, testicular swelling, flatulence, ulcers, ringworms and for treating earache etc.
- The juice of the plant is used on ulcers and other skin diseases. The fruits are used as a tonic, laxative and appetite stimulant.
- It is sometimes prescribed to "remove the effect of old age."

Miscellaneous uses

- Solanum nigrum* is used in resistance breeding program of potato and tomato for imparting resistance against *Phytophthora infestans* and herbicide (atrazine).

Phytochemicals

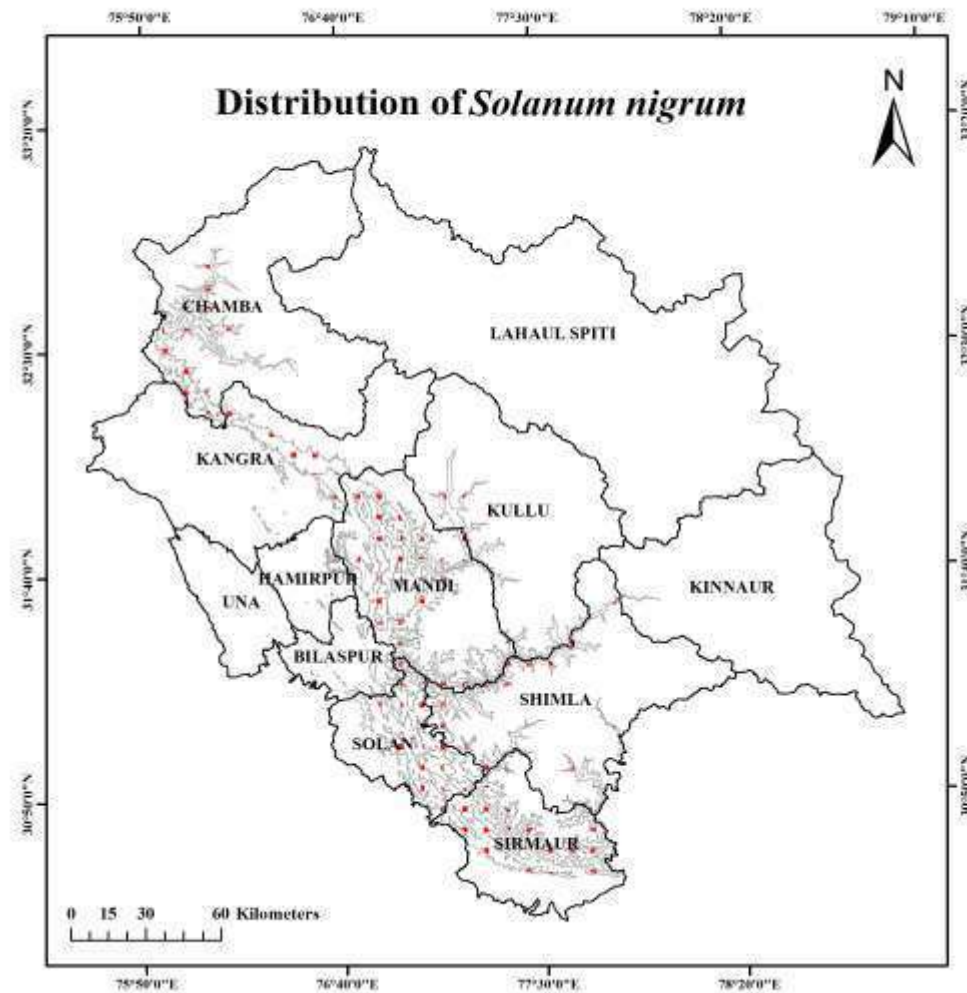
- Glycosides, alkaloids, tannins, saponins and steroids; polyphenolic including gallic acid, protocatechuic acid, catechin, caffeic acid, epicatechin, rutin and naringenin; besides other flavonoids such as, luteolin, quercetin, apigenin, kaempferol and hesperetin.

Unique value

The boiled extracts of leaves and berries are also used in chronic enlargement of the liver.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	60.3
Protein	5.5 g
Carbohydrate	5.1 g
Fats	3.5 g
Dietary fibre	1.5 g
Ash	5.3 g
Energy	73.9 kcal



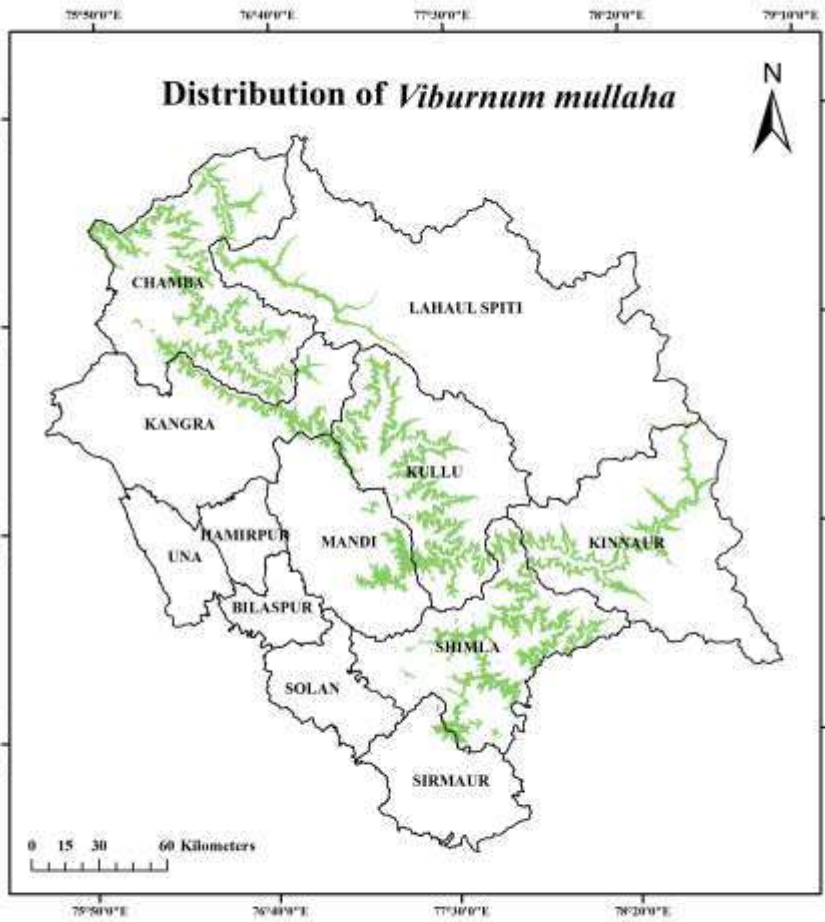
Viburnum mullaha



Viburnum mullaha Buch.-Ham ex. D. Don

Wild Edible Fruits of Himachal Pradesh

Common name : Ghenu, Talana, Thanena, Himalayan Viburnum
Family : Adoxaceae
Elevation : 2000-3200 m
Life form : Small tree
Flowering : April-May
Fruiting : June-July
Distribution : Viburnum is native to the Himalayas, Southeast Asia and is distributed in sub-temperate to temperate areas of Himachal Pradesh.



Ethnobotanical uses

- ✧ The fruits are eaten raw.
- ✧ Twigs are used for brushing teeth during pyorrhoea and other gum problems.
- ✧ A dye is obtained from the fruit.

Medicinal importance

- ✧ The bark of some species is used in herbal medicines as an antispasmodic and to treat asthma.

Miscellaneous uses

- ✧ The wood is moderately hard and the straight branches are used for making walking sticks.

Phytochemicals

- ✧ Chlorogenic acid, acetyl salicylic acid, dihydrorobinetin, dihydromyricetin, 2-isoprenylemodin, rutin, cosmosiinhexaacetate, pectolinarin, dihydroquercetin, eriodictyol, iriginolhexaacetate, theaflavin, epicatechin-pentaacetate, lomatin, and peucenin in fruit extracts.

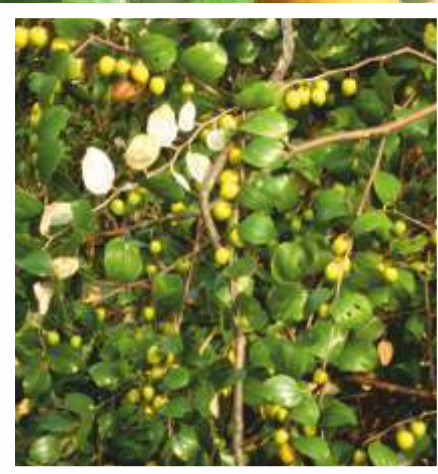
Nutritional profile

Constituents	Value (per 100g)
Proteins	113.0mg
Carbohydrates	184.0mg
Lipids	184.0mg
Vitamin C	122.3 mg
Vitamin B ₂	0.1 mg
Vitamin E	13.5mg
Phosphorus	5.6 mg
Potassium	9.0 mg
Calcium	7.9mg
Magnesium	0.03mg
Copper	0.05mg
Iron	0.7 mg
Zinc	0.05mg
Manganese	0.08mg
Energy	284.4kcal

Unique value

Fruits have very high contents of vitamin-C, vitamin E and vitamin B₂. It contains rutin, a phytochemical which increases the strength and elasticity of arteries/veins and also regulates blood cholesterol level.

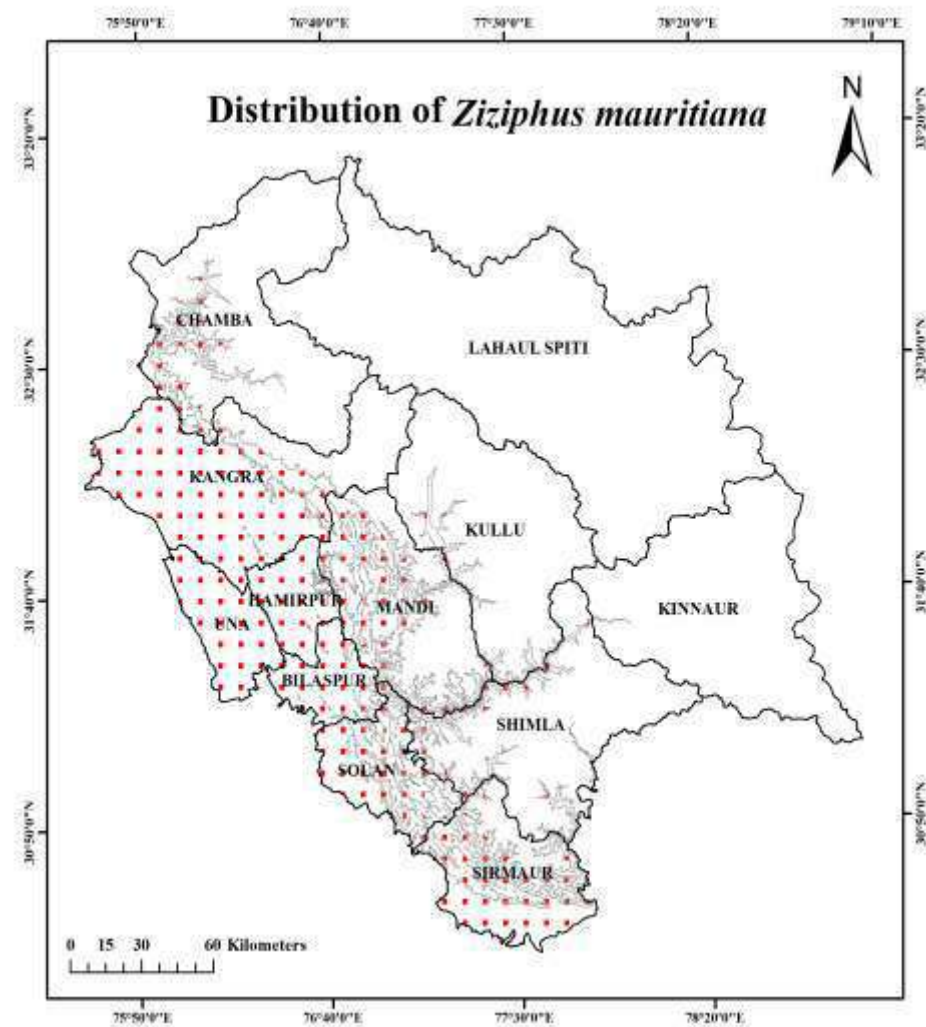
Ziziphus mauritiana



Ziziphus mauritiana Lamk.

Wild Edible Fruits of Himachal Pradesh

Common name	: Ber, Malhe, Jhar Beri, Indian Jujube
Family	: Rhamnaceae
Elevation	: Up to 1500 m
Life form	: Shrub
Flowering	: June–September
Fruiting	: November-February
Distribution	: Indian Jujube is native to South-East Asia. It grows as a wild shrub in wastelands and forests of the Himachal Pradesh.



Ethnobotanical uses:

- ✦ The fruits are eaten as raw or sun dried.
- ✦ The pulp of dried fruit is recommended in Ayurveda for treating burning sensation, blood impurities, excessive thirst and anorexia.
- ✦ Boiled leaves and bark are mixed in bathing water, to treat severe body pain.

Medicinal importance

- ✦ Leaves and bark is used to treat chicken pox and measles. Decoction of shade dried young tender leaves helps in treating scurvy, useful in lowering blood sugar level and diabetes. The paste of leaves is applied topically on pimples, acne, abscesses, boils and carbuncles.
- ✦ The decoction of leaves can be used as diuretic. It is useful in various diseases such as, fluid retention, oedema, acute and chronic renal failure, sciatica, kidney stones, lymphatic swelling, glaucoma and liver disorders etc.
- ✦ Fruit is used to promote weight gain, improve muscular strength and as an immuno-stimulant to increase physical stamina.

Miscellaneous uses

- ✦ This plant is one of the host tree for lac production by *Laccifer lacca* insect.
- ✦ The wood of this plant is very hard and durable and is used in making agricultural implements.
- ✦ Seedlings raised from seeds are used for grafting commercial varieties scions.
- ✦ The plant is grown to prevent soil erosion in sloppy lands.
- ✦ The leaves of the plant enhance milk production in sheep and goats.
- ✦ It is grown as a hedge with its spines creating effective live-fence.

Phytochemicals

- ✦ Alkaloids, flavonoids, glycosides, saponins, sterols, tannins, lignin and phenols.

Unique value

Leaves and root paste of *ber* mixed with the roots of *Cassia auriculata* is applied on the affected body part in rheumatism.

Nutritional profile

Constituents	Value (per 100g)
Moisture%	84.39
Proteins	1.34g
Carbohydrates	9.4g
Total Fats	0.35g
Total fibres	3.73g
Ash	0.8g
Energy	48.8 kcal

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About UNEP GEF MoEFCC ABS Project:

UNEP-GEF and MoEF Project on Strengthening the implementation of the Biological Diversity Act and Rules with focus on its Access and Benefit Sharing (ABS) Provisions is the first ever global project - a programme to access genetic resources, assess their economic value and share the benefits arising out of them among the local people. The executing organisation includes National Biodiversity Authority (NBA) in collaboration with State Biodiversity Boards (SBBs), UNEP-Division of Environmental Law and Conventions (UNEP/DEL/C), United Nations University – Institute of Advanced studies (UNU-IAS).

The Objective of the UNEP-GEF MoEF project on ABS is to increase the institutional, individual and systemic capacities of stakeholders to effectively implement the Biological Diversity Act, 2002 and the Rules 2004 to achieve biodiversity conservation through implementing Access and Benefit Sharing Agreements in India.

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