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Diversity of Some Important Wild Edible Plants of Kumaun Uttarakhand: A Review

Nisha[1], P.B. Rao[2]

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ABSTRACT

Plants are the invaluable, incredible and traditional sources for the curability of various diseases in the form of medicines. Wild food plants, particularly wild fruits, have been an important element in the dietary traditions since the beginning of human civilization. The consumption of locally grown species is gaining an increasing interest, which also gives an important contribution to local communities' health and welfare. In addition, wild fruits contain higher amounts of nutrients and bioactive compounds than many cultivated species. Fruits play at potential role in uplifting the economic condition as well as providing the food security to the local people. The tribal population stores a vast knowledge on utilization of local plants as food and other specific uses. Uttarakhand has very rich biodiversity also its diverse geographical area attract many people towards it in tourism. Wild edible fruit plants have traditionally occupied an important position in the socio-cultural, spiritual and health area of rural and tribal lives. Because in Uttarakhand theses wild fruits helps in health benefits many of them have medicinal importance, also theses fruits are part of source of income.

Key words: Medicinal value, Socio economic importance, Wild edible fruits.

Nature has provided us with different sources of life forms to fulfil the human need both in form of ecological and economic exigency. To fulfil the hunger humans identified and acquired the knowledge for their propagation and subsequently domesticated some of these wild edible species as fruits. These wild fruits are underexploited and their economic importance has not been now 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. Fruits for human consumption account for ~5% of the total plant species of the world. Forest has a large and indispensable role in improving the food security and livelihood of the tribal society (Yesodharan and Sujana, 2007). During early days, man lived by hunting and fruit gathering collected from the wild (Tomar *et al*., 2015). Since, wild edible plants are freely accessible within natural habitats; indigenous people have more knowledge in gathering and preparing food items from these wild plant resources (Somnasang and Black, 2000).

Fruits being a major forest product, supplement human diet as they provide essential vitamins, minerals and fiber required for maintaining health (Kumari, 2008). They play a significant role in the wide range of agricultural system as a source of wild food and have an important socio-economic role through their uses in medicine, dyes, shelter, fibers and religious and traditional ceremonies (FAO, 1999). Fruits being one of largest forest resource have the potentiality to uplift the economic condition as well as providing the food security to the local people of the region (Deb *et al*., 2013). World over, tribal population stores a vast knowledge on utilization of local plants as food and other specific uses

[1]Goverment P.G. College, Syalde, Almora-263 661, Uttarakhand, India.

[2]Department of Biological Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar-263 145, Uttarakhand, India.

Corresponding Author: Nisha, Goverment P.G. College Syalde Almora-263 661, Uttarakhand, India. Email: nishaarya24@gmail.com

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(Sudriyal *et al*., 1998). A large number of wild spices used by the tribal in meeting their daily requirement are through the diverse vegetation of that area. Use of large number of wild species by the tribal to meet their diverse requirement is largely due to the prevalence of diversity of vegetation in the area.

Wild edible plants have traditionally occupied an important position in socio-cultural spiritual and health arena of rural and tribal lives of India. India has one of the oldest, richest and most diverse cultural traditions associated with the use of medicinal plants in the form of a traditional system of medicine. The diversity in wild plant species offers a variety of family diet and contributes to household food security. Today, most human plant food is based on rather limited number of crops, but it is clearly that in many parts of the world the use of wild plant is not negligible. Sometimes the nutritional value of wild plant is higher than several known common vegetables and fruits.

Uttarakhand state is characterized by a rich diversity of ethnomedicinal plant as well as a rich heritage of wild edible plant system. The edible plant species of Uttarakhand, it is 97 in numbers including cereals and pseudocereals

List of some wild edible fruits of Uttarakhand.

Botanical name	Common name	Family
Rubus ellipticus Sm.	Hishalu	Rosaceae
Ficus auriculata Lour.	Timla	Moraceae
Berberis asiatica Roxb. ex DC	Kilmora	Berberidaceae
Diplazium esculentum (Retz.) Sw.	Lingura	Athyriaceae
Rhododendron arboreum Sm.	Buransh	Ericaceae
Pyrus pashia Buch.-Ham. ex D.Don	Mehal	Rosaceae
Myrica esculenta Buch.-Ham. ex D. Don	Kaafal	Myricaceae
Prunus armeniaca L.	Wild apricot, Khumani	Rosaceae
Phyllanthus emblica L.	Amla	Phyllanthaceae
Elaeagnus umbellata Thunb.	Ghain	Elaeagnaceae
Punica granatum L.	Darim	Lythraceae
Hippophae rhamnoides L.	Sea buckthorn	Elaeagnaceae

*Source: http://www.theplantlist.org/.

(08 crops), Millets and minor millets (06 crops), oilseeds (11 crops), Vegetables (28 crops), spices and condiments (10 crops) and fruits (19 crops) whereas in case of wild edible species, there are 94 plant species including wild edible fruit (67) and wild edible vegetables (27), respectively.

Rubus ellipticus Sm.

Belonging to Rosaceae family commonly known as Yellow Himalayan Raspberry is mostly found in forest edges and numerous forests exist over wide areas of mountains and lowlands of India and Srilanka (Wu *et al.* 2013) The genus Rubus is very diverse, includes over 750 species in 12 subgenera and is found on all continents except Antarctica (CABI, Cambridge, MA 2008).

Botanical description

Shrubs, branchlets purplish brown with sparse, curved prickles and dense. Leaves imparipinnate, 3-foliolate; stipules linear, pubescent, with intermixed glandular hairs; blade of leaflets elliptic or obovate, terminal leaflet much larger than lateral leaflets. Inflorescences terminal, dense glomerate racemes, flowers several to 10, bracts linear, pubescent. Calyx abaxially pubescent, intermixed yellowish tomentose, Petals white or pink, spatulate, densely pubescent, base clawed. Stamens numerous, shorter than petals; filaments broadened and flattened basally. Ovary pubescent; styles glabrous, slightly longer than stamens. Aggregate fruit golden yellow, subglobose, Fl. Mar-Apr, fr. Ap-May.

Ethanobotanical uses

Rubus species has been used in folk medicine (Patel *et al*. 2004). The phytochemical, antioxidant and medicinal attributes and health promoting constituents of cultivated Rubus berries are usually well recognized (Milivojevic *et al*. 2011; Wang and Lin 2000; Kafkas *et al*. 2008). The fruit is edible and posses' astringent, febrifuge, kidney, miscellany, stomachic properties. The juice of the fruit is used in the treatment of fever, colic, coughs and sore throat. The inner bark is used in Tibetan medicine, it is said to have a sweet and sour flavour plus a heating potency. A renal tonic and ant diuretic, it is used in the treatment of weakening of the senses, polyuria and micturation during sleep. In recent years, multiple drug/chemical resistance in both human and plant pathogenic microorganisms have been developed due to indiscriminate use of commercial antimicrobial drugs/ chemical commonly used in the treatment of infectious diseases (Saklani *et al*. 2011). The whole plant has astringent properties and has been used to reduce fevers, especially typhoid. The inner bark of the Yellow Himalayan Raspberry is used as a kidney tonic and an anti-diuretic. The juice extracted from the root has also been used for fever, gastric problems (including infant colic when the young shoots are used too), diarrhoea and dysentery and the root paste, applied to wounds promotes healing. The fruit juice is also used to bring down the temperature of a fever and for colic and is good for sore throats and colds too; also it is use to treat fever, colic, coughs and sore throat. The young roots and shoots of the plant are effective during stomach ache, abdominal pain, colic pain, *etc*. In Unani and Ayurveda, antifertility. The plant is also used for wound healing, gastralgia, dysentery, ulcer, diabetes mellitus, antifertility, analgesic, antimicrobial and epilepsy (Kaur *et al*. 2019).

Ficus auriculata Lour.

It is commonly known as Elephant Ear Fig belongs to Moraceae family consists of over 800 species in 40 genera is an evergreen shrub or small tree native to India, Pakistan, China and Nepal. This plant is widely distributed in temperate, tropical and subtropical regions of about 1800-2600 m altitude.

Botanical description

Trees, 4-10 m tall, dioecious. Branchlets reddish brown, pubescent. Stipules reddish purple, triangular-ovate. Leaves alternate; petiole thick; leaf blade broadly ovate-cordate. Figs on specialized leafless branchlets at base of trunk and main branches, reddish brown, pear-shaped, depressed globose, or top-shaped, white, shortly pubescent when young, glabrescent when mature; peduncle, thick, pubescent; Male flowers: sessile; calyx lobes 3, transparent, spatulate, thinly membranous; stamens 2; filaments long;

Rubus ellipticus

Ficus auriculata

Berberis aristata

Rhododendron arboreum

Pyrus paschia

Prunus armeniaca

Myrica esculenta

Phyllanthus emblica

Diplazium esculentum

Elaeagnus umbellata

Punica granatum

Hippophae neurocarpa

anthers ovoid. Gall flowers: calyx lobes 3, apically free, covering ovary; style lateral, hairy; stigma enlarged. Female flowers: pedicellate or sessile; calyx lobes 3; ovary ovoid; style lateral, longer than in gall flowers, with hairs. Achenes with adherent liquid. Fl. Aug-Mar, fr. May-Aug.

Ethanobotanical uses

A number of *Ficus* species are used as a food and for medicinal properties in Ayurvedic and Traditional Chinese Medicine to treat several common illnesses. It has abundant amount of white latex in every part of the plant. Bark is grayish brown with rough texture. Branchlets are reddish brown. Figs (also called fruits) are reddish brown, pear shaped, globose or top shapered in nature and generally occur on leaflets branchlets at base of trunk and main branches. These plants were traditionally used in the treatment of various diseases. Stem and bark juice is effective for diarrhea and dysentery. Fruits are edible and can be made into jams and curries. Roasted figs are taken for diarrhea and dysentery. Root latex is used in mumps,

cholera, diarrhea and vomiting and also used in jaundice. Several tribal in Northern eastern India especially in Manipur use the leaf and fruit traditionally for the treatment of diabetes. Gaire *et al*. (2011). Suggest that the plant must have antimicrobial as well as antioxidant activity. Several studies on other species of *Ficus* have shown the potential antioxidant and antimicrobial activity (https://shodhgangotri. inflibnet.ac.in).

***Berberis asiatica* Roxb. ex DC**

Commonly known as "Kilmora" is spinous shrub native to northern Himalaya region. It grows at the height of 2000-3000m especially in Kumaon and Chamba region of Himachal Pradesh.

Botanical description

Kilmora is a pretty shrub 1.8 to 2.4 m in height, armed with trifid spines, oblong-ovate or obovate, acute, mucronate, long-petioled leaves with aristato- dendate margin, yellow flowers in umbellate racemes and oblong-ovoid edible berries. It is also grown in hedges. The alkaloids present in the plant are: Berberine and Palmatine are present as chlorides.

Ethanobotanical uses

It posseshypoglycemic, anti-bacterial, anti-fungal, anti-pyretic, anti-inflammatory, hepatoprotective, antioxidant, anticancer. The plant fruit is edible and it is rich in Vit -C. A very valuable ayurvedic preparation 'Rashut' is prepared by this plant which is used in curing human ailment like ophthalmic, ulcer as a laxative and tonic and blood purifier (Komal *et al*., 2000). The fresh roots are used for curing diabetes and. The total alkaloid content in the roots is four percent and in the stems, 1.95%, of which berberine forms 2.09 and 1.29%, respectively. The stems are recommended in rheumatism. The roots are reported to possess anti-cancer activity. The berries are mildly laxative and are given to children. Wild edible fruits, besides being important sources of minerals, fibre and vitamins, provide essential nutrients for maintaining good health (Saklani and Kothiyal 2011). The fruits are also processed into beverages, drinks, syrups, candy and other confectionary products which are popular Iran. Furthermore, the leaves and fruits have also found applications in the production of food flavorings and teas. Berberis are popular due to their nutritional importance; however, they have found most usefulness in folk and traditional medicine where various parts, including roots, bark, leaves and fruits serve as major ingredients of herbal remedies in Ayurvedic, Iranian and Chinese medicine dating back at least 3000 years (Salehi *et al*., 2019)

***Diplazium esculentum* (Retz.) Sw.**

Diplazium esculentum commonly called vegetable fern of family Athyriaceae is abundant in open moist herb land vegetation and the partially open young and circinately coiled fronds of this plant are regularly consumed by local people as a nutritive leafy vegetable.

Botanical description

Rhizome erect, up to 15 cm tall, densely scaly; scales brown, narrowly lanceolate, toothed at margin; Fertile fronds; stipe brown-stramineous, sparsely scaly, upward glabrous or hairy; lamina 1-pinnate or 2-pinnate, deltoid or broadly lanceolate or longer, apex acuminate; pinnae 12-16 pairs, alternate, ascending, lower pinnae stipitate, broadly lanceolate, pinnatilobate or 1-pinnate; upper pinnae subsessile, linear-lanceolate, base truncate, margin serrate or pinnatilobate (lobes minutely serrate), apex acuminate; veins per lobes pinnate, veinlets 8-10 pairs, ascending, lower 2 or 3 pairs usually conjoined. Lamina stiffly herbaceous, glabrous or hairy, rachis glabrous or hairy; costae shallowly grooved, glabrous or occasionally with light brown short hairs. Sori mostly linear, slightly curved, from near midribs to laminar margin; indusia yellow-brown, linear, membranous, entire. Spore surface with large granular or tuberculate projections.

Ethanobotanical uses

It is a fern used by people as a traditional medicine to treat acne, tumors and asthma and to dry out scars. Ferns that can be consumed as well as being useful as certain drugs contain a natural source of bioactive compounds that can be used as natural medicines and can potentially be developed as new drugs. Various parts are used for numerous purposes. Leaves used as vegetables; dried rhizomes are used as an insecticide, decoction of this plant is used in the treatment of cough and sometimes as a tonic (Chawala *et al*., 2015) providing the basic needs, this fern have got considerable anti-inflammatory and anti-hepatoprotective activities (Nair *et al*., 2015) and also significant cytotoxic, anti-microbial, antioxidant properties (Akter *et al*., 2014). However, a study revealed, even after cooking, this fern may induce infertility to the male reproductive system (Roy and Choudhuri, 2015). Another study reported that daily consumption of the fern was found to elevate the risk of esophageal cancer (Somvanshi *et al*. 2006). The people of lower socio-economic communities rely mainly upon the collection and selling of this plant during the summer and monsoon season in the study area (Zannah *et al*., 2017; Sarkar *et al*. 2018).

***Rhododendron arboreum* Sm.**

Commonly known as "Burans", belongs to the family Ericaceae, it is one of the highly valued wild edible flower growing between 1500 and 2400 m above sea level. The genus forms dominant combination of forest types in the high altitudes (above 1500 m) of the of Garhwal region having ecological significance and economic importance in addition to its graceful flowers. A total of 72 species, 20 subspecies and 19 varieties have been listed from India Negi *et al*., 2013.

Botanical description

Trees, usually evergreen, (20-30) m tall; trunk well-defined; bark gray-brownish, exfoliating into thin and small irregular flakes; young shoots stout, with distinct leaf traces, densely grayish tomentose, glabrescent. Petiole with dense fawn

indumentum intermixed with glands, sometimes glabrescent; leaf blade leathery, oblong-lanceolate or oblong-oblanceolate, margin revolute; apex acuminate or acute; abaxial surface with indumentum 1- or 2-layered, densely compacted, lateral veins 15-26-paired. Inflorescence dense, -flowered, rachis, tomentose. Pedicel pilose, glandular; calyx lobes small, triangular, sparsely glandular and hairy; corolla tubular-campanulate, pink to deeply crimson, rarely white, with 5 black-blotched basal nectar pouches and dark flecks; lobes, apex emarginate; stamens 10, unequal, filaments glabrous; ovary conoid, white-tomentose, sometimes also glandular; style glabrous. Capsule cylindric, Fl. May, fr. Aug.

Ethanobotanical uses

Rhododendron is one such plant that is acquiring a special place in the cultural as well as economic life of the people. Rhododendron is derived from Greek word: “rhodo” means “rose” and “dendron” means “tree”. It is regarded as one of the most beautiful flowers wearing, evergreen medicinal plant (Srivastav *et al*., 2012). The red fresh petals are used for making pickles, chutney (sauce) juice and squash. The bright red sweet squash is being sold by locals propagating its heart friendly properties. It is believed that the squash helps in lowering blood pressure. It also lowers down the cholesterols from the arteries and checks thetriglycerides level. Ayurvedic preparation "Asoka Aristha," containing *R. arboreum* possesses oxytocic, estrogenic and prostaglandin synthetase-inhibiting activity. The dried flowers are supposedly highly efficacious in checking diarrhoea and blood dysentery (Laloo *et al*., 2006). The young leaves are said to be poisonous (causes intoxication in large quantities) as well as medicinal and applied on the forehead to alleviate headache. The fresh and dried corolla that is acid-sweet in nature is given when fish bones get struck in the gullet. Anti-inflammatory, hepatoprotective, anti-diabetic, anti-diarrhoeal activity Srivastava (2012). Phenolic acids obtained from its leaves and twigs have been reported to have anti-HIV, anti-inflammatory, anti-nociceptive activities, and also its leaves and flowers are utilized for treating illness, headache, diabetes, rheumatism (Kumar *et al*., 2019).

Pyrus pashia Buch.-Ham. ex D.Don

The genus *Pyrus* belongs to family Rosaceae. The genus contains about 38 species (Zamani *et al*. 2009). It is commonly known as wild pear, mehul, molz is edible for its fruits.

Botanical description

Trees to 12 m tall. Branchlets purplish brown or dark brown. Stipules caducous, linear-lanceolate, petiole, initially pilose; leaf blade ovate or narrowly ovate, rarely elliptic, tomentose when young, glabrescent, base rounded, rarely broadly cuneate, margin obtusely serrate, apex acuminate or acute. Raceme umbel-like, flowered; peduncle initially tomentose, glabrescent; bracts caducous, linear, pedicel initially tomentose, glabrescent. Flowers, hypanthium cupular, abaxially tomentose. Sepals triangular, both surfaces tomentose, margin entire, apex acute, acuminate, or obtuse. Petals white, obovate, base shortly clawed, apex rounded. Stamens 25-30. Ovary 3-5-loculed, with 2 ovules per locule; styles 3-5, nearly as long as stamens, glabrous. Pome brown, with pale dots, subglobose. Fl. Mar-Apr, fr. Aug-Sep.

Ethanobotanical uses

Pyrus pashia is also known as wild pear and is edible (Kala, 2007). It is most commonly used as laxative, febrifuge and sedative (Matin *et al*., 2001). Fruit is suitable for dehydration also in digestive ailments. These are also used to treat infected eyes of cattle in pterygium disease its cell sap is used as conjunctivitis (Promila and Dinesh, 2005). It is used in gastrointestinal disorders, fever and headache, sweating of body (diaphoretic), hysteria and epilepsy. The fruits of this plant are sedative, febrifuge and laxative (Murad *et al*. 2008). The leaves are bitter in taste, served as fodder for goats and sheep as well as butter tea beverages by the *Monpa* community of Tawang, Arunachal Pradesh, India (Tsering *et al*., 2012) 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.The fruits are tasty and eaten by local people as diet and are known to be useful in constipation (Abbasi *et al*., 2013) while fruit is used to minimize thirst. Fruit juice is astringent and diuretic and is used to manage dysentery, leishmaniasis eye problems digestive disorder, sore throat, irritability, abdominal pain, anemia, anti-microbial, anti-oxidant, stomach-ache and hypoglycemic activities of fruit. Decoctions containing dried fruits with other plant parts are used for improvement in spleen and stomach functions. The fruit is added to cattle fodder to enhance milk production. The barks of tree possess astringent, laxative, anthelmintics and febrifuge properties and is used traditionally to manage digestive disorders. The barks possess astringent and tonic properties and are used to manage sore throat, fever, peptic ulcer, gastric ulcer and typhoid fever (Janbaz *et al*., 2015). The leaf extract is used as a tonic for hair loss and woods are used as a major fuel source in the central Himalayan region and consumed as tea beverages by many monpa community of twang, Arunachal Pradesh (India). Twings of the tree are used in tooth ache problems by the indigenous people of Jammu Kashmir and Laddhak divisions of India. Fruits is used for the treatment of dehydration, GI disorder, fever, headache, hysteria and epilepsy. Edible flowers is used in Cardiovascular disease and certain cancers, these properties is attributed by the presence of phenolic compounds (Ali and Juyal, 2018).

Myrica esculenta Buch.-Ham. ex D. Don

Genus *Myrica* is a large group comprising more than 97 species in the Myricaceae family. This family contains woody plants native to the subtropical and temperate zones, known for its edible fruits and other by-products. Indeed, its fruits have been a potential income generating source for the local tribes of sub-Himalayan region.

Botanical description

Trees evergreen, dioecious, tall; bark gray. Branchlets and buds tomentose. Petiole pubescent to tomentose; leaf blade narrowly elliptic-obovate or lanceolate-obovate to cuneate-obovate, leathery, abaxially pale green, dark punctuate, Male inflorescences much branched, erect or pendulous at apex; Male flowers without bracteoles. Stamens 3-7; anthers red, ellipsoid. Female inflorescences erect, flowers in short, axillary fascicles well-spaced at maturity; rachis densely pubescent and golden glandular; bracts ciliate, golden. Female flowers with 2 bracteoles, ciliate and golden glandular. Drupes, papilliferous. Fl. Aug-Feb, fr. Nov-May.

Ethanobotanical uses

The wild edible fruits have evidenced to play important role in health benefits and nutrition (Rawat *et al*., 2011). Among 675 wild edibles plant species in Indian Himalayan region commonly known as “Kaphal”, is highly valuable wild edible fruit with potential in-come-generating species in the region (Pandey *et al*., 1993). The bark of the tree is traditionally used as antiseptic, fish poisoning and external plaster in rheumatism. It is also used for tanning and dying yellow colored dye is obtained. Extract of the bark reported to show anti-hyperlipidemic effect and have chemo-protective and antioxidant properties. The bark of the stem contained pro-anthocyanidin, tannins, glycosides, gallic acid, myricanol, myricanone, epigallocatechin 3-O-gallate. The flower oil is a tonic useful in earache, diarrhea, inflammation and paralysis (Jeeva *et al*., 2011). The fruit have high amount of phenolics, flavonoid and natural antioxidants which can play vital role in reducing the oxidative stress and preventing from certain degenerative diseases and possess anti-inflammatory and antimicrobial properties. The variations in phenolic and flavonoid contents across populations may be attributed to morphological as well as biochemical characters of the fruits and can utilized for identification of best provenances for promotion under large scale plantation through horticulture and forestry interventions (Rawat *et al*. 2011). A large part of population living in rural areas of Uttrakhand, use stem bark to cure chronic cough, asthma and ulcers and bark powder is inhaled to cure headache. Local people of Sub-Himalayan region use decoction of bark as mouth freshener and to cure tooth-ache (Pandey *et al*., 2016) while paste of bark is applied on wounds, joints pains and paralysis as well as used to cure cold and headache. Fruit are eaten raw or used to prepare refreshing drinks while its juice is used against bacterial dysentery by tribal communities of Meghalaya and bark is chewed to relieve toothache and for washing putrid sores. The proximate analysis of nutrients such as crude fibre, crude protein, crude fat, crude carbohydrates, ash value, moisture content and mineral contents such as Na, K, Ca, Mg, Fe, Zn, Mn and Cu (Sood *et al*., 2018).

Prunus armeniaca L.

It is commonly known as Apricots, belongs to Rosaceae family, fruit are drupes that resembles and are closely related to peaches or pulms as one of the top consumed fruits.

Botanical description

Apricots are the deciduous plant which grows up to 9 m height. The leaves are oval and finely serrated with 5-petaled white flowers growing together in clusters. The fruit's color varies from yellow to orange to deep purple and ripens in late summer.

Ethanobotnical uses

The plant is found to be rich source of carbohydrates (both mono and polysaccharides, polyphenols, caretenoids (β-carotene) vitamins C and K, thiamine, niacin, iron, organic acids, phenols, and volatile compounds *viz*. benzaldehyde, esters, isoprenoids and terpenoid. The kernels are reported to contain the cyanogenic glycoside amygdalin (vitamin B17) due to which if eaten they are hydrolyzed by enzyme β-glucuronidase in alkaline environment of small intestine into glucose, benzaldehyde and hydrocyanic acid and with emulsification, it’s absorbed quickly and circulates in the body and thus can be responsible for its toxic effects. This is more common in children due to children’s lower body mass and thus children’s high gastric acidity than that of adults. Ripe fruit pulp contains total solids (12.4-16.7%), insoluble solids (2.1-3.1%), acids as malic acid (0.7-2.2%), total sugar as invert sugar (5.3-8.6%), glucose (3.2-4.8%), fructose (1.4-4.25%), sucrose (1.4-5.4%) and tannins (0.06-0.10%) (Jain *et al*., 2012).

Apricots have important nutritional properties; it is strongly recommended to consume them in cases of vitamin A and trace element deficiencies, anemia, physical and mental fatigue, depression, neurosis, stress, *etc*. They are a tonic for the nervous system and increase the body’s natural defence reaction. Since they have an alkaline action, apricots help maintain the acid-base balance in the blood and body tissues and decrease acidity resulting from a diet too rich in meat and flour products. Apricot fruit contain the major minerals K, Ca and Mg (Drogoudi *et al*. 2008). Apricot fruit contains lycopene, which helps to prevent cancer and protects the body from high cholesterol, thus preventing heart disease. Some apricot cultivars have recently been evaluated for their antioxidant profile, suggesting their health-promoting effects in the human diet (Leccese *et al*. 2010). Antioxidant compounds, such as carotenoids, polyphenols, and vitamin C, have been reported in high amounts in apricot fruit (Drogoudi *et al*. 2008; Dragovic-Uzelac *et al*. 2009; Hegedüs *et al*. 2011; Sochor et al. 2011; Caliskan *et al*. 2012; Fan *et al*. 2018; Fratianni *et al*. 2018).

Phyllanthus emblica L.

Commonly known as Indian gooseberry or amla, family Euphorbiaceae. The wild amla is small, while cultivated amla is big, smooth and juicy.

Botanical discription

Trees, monoecious, deciduous; main stems terete. Leaves distichous; stipules triangular-ovate, brown, margins entire or denticulate; petiole; leaf blade oblong or linear-oblong; lateral veins 4-7 pairs. Male flowers: pedicels; sepals 6,

membranous, yellow, obovate or spatulate, subequal, apex obtuse; disk glands 6, subtriangular; stamens 3; filaments coherent. Female flowers: pedicels, sepals 6, oblong or spatulate, apex obtuse or rounded, lobate; ovary ovoid, styles 3, connate at base, deeply bifid, lobes divided at tip. Fruit a drupe, globose, exocarp fleshy. Seeds reddish, Fl. Apr-Jun, fr. Jul-Sep.

Ethanobotnical uses

The Indian gooseberry or Amla is an edible fruit and is sour, bitter, astringent and quite fibrous. It is highly valued by nutritionists and Ayurvedic practitioners owing to their rich wealth of various nutrients. It's a 5000 year old natural healing system of medicine that is indigenous to India. It is a major ingredient in many Ayurvedic preparations including Triphala and Chyawanprash, a general tonic for people of all ages for overall mental and physical well-being. Traditionally has been used in Ayurveda for the treatment of diarrhoea and fever, as a diuretic, in inflammation, skin sores and wounds and as a potent rasayan in hepatic disorders. The fruit of the plant has been prescribed for different pharmacological activities like antioxidant (Liu *et al.,* 2008), anti-tumor, hepatoprotective (Jose *et al*., 2011), gastroprotective (Al-Rehaily *et al*., 2002), anti-tussive (Nosal'ov *et al*., 2003) and antidiabetic (Nain *et al*., 2012). It also contains vitamin C, minerals, amino acids, tannins, phyllembelic acid, phyllemblin, rutin, curcuminoids, emblicol and some phenolic compounds. Anti-microbial, anti-oxidant, anti-inflammatory, analgesic and anti-pyretic, adaptogenic, hepatoprotective, anti-tumor and anti-ulcerogenic activities also reported (Gaire and Subedi, 2014).

Elaeagnus umbellata Thunb.

Commonly known as cardinal olives, autumn olives or autumn elaeagnus.

Botanical description

Shrubs, deciduous, erect with branchlets spreading. New branches and buds silvery scaly. Petiole leaf blade obovate, papery. Flowers fasciculate in axils of both long and short shoots; pedicel, Flowers silvery white. Calyx tube funnel-shaped, slender; lobes triangular-ovate, Filaments; anthers elliptic, Style with stellate hairs; stigma. Drupe red, nearly globose, Seed Fl. Apr-May, fr. Jul-Aug.

Ethanobotanical uses

It is a multipurpose plant from Himalayan regions. Its flowers and fruit are rich in vitamins, flavonoides, essential oil, lycopene and other bioactive compounds. The *Elaeagnus umbellata* berry is an excellent source of vitamins and minerals, especially vitamin A, C, E, flavonoids and other bioactive compounds. It is also a good source of essential fatty acids. 100 g of fruit contains 69.4 g of moisture, 14.5 g of total soluble solids, 1.15 g of organic acids, 8.34 g of total sugar, 8.13 g of reducing sugars, 0.23 g of non-reducing sugars and 12.04 mg of vitamin C. The total mineral content of the fruit as represented by its ash is 1.045%. It also contains lycopene, b-carotene, lutein, phytofuluene and phytoene. The lycopene content per 100g ranged from 10.09 to 53.96 mg in fresh fruit from the naturalized plants and from 17.87 to 47.33 mg in the cultivars with red-pigmented fruit. Cultivar with yellow fruit has only 0.82 mg/100 g fresh weight of fruit. In contrast, fresh tomato fruit which is the major dietary source of lycopene, has lycopene content of 0.88 to 4.20 mg per 100 g. This newly identified source of lycopene may provide an alternative to tomato as a dietary source of lycopene and related carotenoides lycopene is widely believed to protect against myocardial infection (Kohlmeier *et al*. 1997) and various forms of cancer, including prostate cancer (Giovannucci *et al*., 1995). Thus, it shows potential deterrent to heart disease, cervix and gastrointestinal tract cancer. The floral volatiles of contain palmitic, C14 to C20 fatty acid, methyl esters, eugenol, 4-methyl phenol, phenylacetate aldehyde and (E)-2-nonenol. The seeds are used as a stimulant in the treatment of coughs. The seed oil is used in the treatment of pulmonary affections. Fruits can be used in raw or cooked form. Fruit is juicy, pleasantly acidic and can also be made into jams or other preserves (Ahmad *et al*., 2005)

Punica granatum L.

Botanical description

Shrubs or small trees, branches and branchlets 4-angled terminating as indurate spines. Floral tube red-orange or pale yellow, campanulate-urceolate, sepals 5-9, erect, petals bright red-orange obovate, apex rounded or obtuse. Stamens numerous, included to exserted. Ovary 8-13-loculed, lower locules with axile placentation. Fruit globose, leathery berries, variable in color, red to yellow-green or red-brown, crowned by persistent sepals, irregularly dehiscent. Seeds obpyramidal within juicy, ruby-red, pink, or yellowish white. Fl. Mar-Jul. 2n = 16, 18.

Ethanobotanical uses

In the ancient Ayurveda system of medicine, the pomegranate has extensively been used as a source of traditional remedies for thousands of years. The rind of the fruit and the bark of the pomegranate tree is used as a traditional remedy against diarrhea, dysentery and intestinal parasites. The seeds and juice are considered a tonic for the heart, throat, eyes and for a variety of purposes, such as stopping nose bleeds and gum bleeds, toning skin, firming-up sagging breasts and treating hemorrhoids. In the past decade, numerous studies on the antioxidant, anti-carcinogenic and anti-inflammatory properties of pomegranate constituents have been published, focusing on treatment and prevention of cancer, cardiovascular disease, diabetes (Bhowmik *et al*., 2013).

Hippophae rhamnoides L.

Botanical discription

Shrubs or dwarf trees, usually flat-topped, Leafy stems slender, unbranched, spine tipped. Leaves alternate; leaf blade abaxially silvery, margin revolute or flat. Fruit brown

or yellowish red, cylindric, distinctly curved, silvery scaly. Endocarp difficult to separate from seed, seed cylindric, curved, surface mat, longitudinally ridged.

Ethanobotanical uses

Plant is being used in different parts of the world for its nutritional and medicinal properties. Sea buckthorn based preparations have been extensively exploited in folklore treatment of slow digestion, stomach malfunctioning, cardiovascular problems, liver injury, tendon and ligament injuries, skin diseases and ulcer. It is a multipurpose fast growing species which is serving as a measure of biodiversity conservation, soil conservation, medicines, food, fodder and fuel wood. It has sour taste, sharp lemon flavour and contains 60 to 80% juice rich in amino acids, organic acids, sugar, tannins and vitamins and also contains 3 to 5% of pulp oil and 8 to 18% of seed oil (Jasra *et al*., 1998). Berries, seeds and leaves of the plant are widely used as a folk medicine for the treatment of hypertension, oedema, inflammation, tissue-regeneration, skin-grafts, burns/injury, wounds and ulcers (Pundir *et al*., 2020). A variety of chemical ingredients including flavonoids, phenolic acids, proanthocyanidins, carotenoids, fatty acids, triterpenoids, liganas, vitamin (vitamin C and E, *etc*.) and phytosterols were found in fruits, leaves and seeds. the nutrition constituents including flavonoids, vitamins, fatty acids, carotenoids and phytosterols (Ren *et al*., 2020).

CONCLUSION

Wild edible plants play an important role in food supplements during scarcity for local inhabitants. Research says that many wild edible species of Himalayan region have various medicinal and neutraceutical properties. Neutraceuticals are currently receiving recognition as being beneficial in coronary heart diseases, obesity, diabetes, cancer *etc*. There is immense scope for the consumption and value addition of these crops. Industrialist and scientist should focus on research and developments related to these crops for the benefit of society. Utilization and improvement of underutilized edible fruit species is constrained by lack of detail knowledge, inadequate understanding of taxonomy and biology of these taxa. Therefore urgently required is to identify the neglected and under-utilized species that merit consideration for national plant germplasm conservation and use with an aim to improve the livelihoods of rural poor, and to provide insurance for food security. To achieve this, it is necessary to assess the local, regional and global significance of wild species in terms of their contribution to food security, sustainability of ecosystems and potential for domestication and commercialization.

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