Exotic Fruits and Veggies of UK State: Their Nutritive, Ethanobotanical, Nutraceutical and Therapeutic Mannerisms

By

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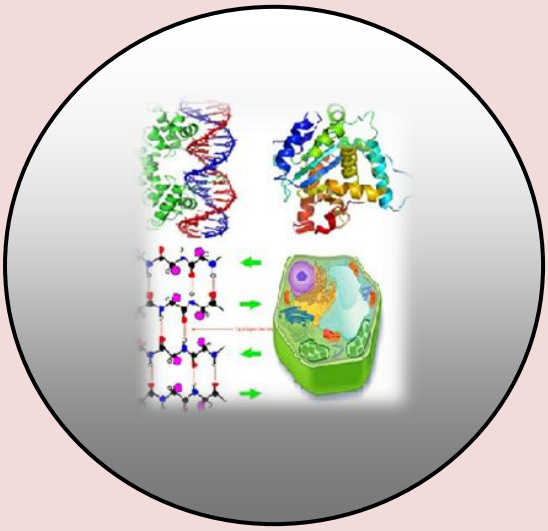

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ABSTRACT

The wild edible fruits satisfy substantially the food requirements of the economically poor population in rural areas. Many of the wild fruits which are gathered by local people are attaining market value in recent years. The information on such plants may help in adding variety to the monotonous diet and fulfil requirements of minerals and vitamins etc. They maintain the diversity in the food system which has sustained the hill people for generations from calamities such as crop failure etc. The diversity of these fruits is depleting due to human interference, infra-structural development and deforestation. A lot of efforts have been made for cultivation of commercial fruit crops but no efforts have been made for domestication, conservation and utilization of these under-exploited, nutritionally and medicinally rich fruits. It will be worth to assess productivity, food and market values of some local wild edible fruits. This will help in improving the socio-economic conditions of the people of this region along with conserving the environment and a very fragile eco-system. Some potential wild fruits growing in this region have been described here. The present review has been delineated concisely towards enhanced consideration of their nutritional, ethanobotanical, nutraceutical and therapeutic mannerisms.

Keywords: Anthropogenic, Wild fruits, Ecosystem, Socio-economic conditions, Conservation, Environment, Nutrition and Supplement foods.

INTRODUCTION

Wildly grown fruit plants are conventionally widely distributed on Earth. However, they are mostly found as the component of natural ecosystems where human activities are less or nearly negligible. The utilization of Himalayan plant species for foods and medicine has been kenned for a long time. Uttarakhand, the North Indian state on Himalayan foothills is one of these places which are felicitous for magnification of wild edible fruiting plants because of their unique geographical and climatic conditions and splendid taste of fruits which are magnetized by their people as an opulent source of their nutrition (Saklani et al., 2011). Wild edible plants are very consequential for the salubrity of rural populations in the region, not only as sources of supplemental food, balanced diets, medicines, fodder and fuel, but also for their income engendering potentials. Immense numbers of wild fruits along with their edible values also utilized in medicine and many other wild fruits viz. *Rubus ellipticus, Fragaria* × *ananassa, Prunuspersica, Myrica esculenta* etc. have high nutritive quality and utilized by the local peoples for the different edible products. Such wild plants might be explored for their alimental and medicinal properties and need to conserve for biodiversity maintenance. Nutraceuticals have received considerable interest because of their postulated safety and potential nutritional and therapeutic effects. Pharmaceutical and food companies are cognizant of the monetary prosperity capitalizing on the more health-seeking consumers and the transmuting trends resulting in a proliferation of these value-integrated products aimed at heart health to cancer treatment and prevention. Majority of the nutraceuticals are claimed to possess multiple therapeutic benefits though substantial evidence is destitute for the benefits as well as unwanted effects (Meyers et al., 2003).

WILD EDIBLE PLANTS WITH NUTRACEUTICAL ACTIVITY

Wild edible plants have traditionally occupied a consequential position in the 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 utilization of medicinal plants in the form of traditional systems of medicine (Gangwar and Deepali Gangwar, 2010). Plants are the invaluable, incredible and traditional sources for the curability of sundry diseases in the form of medicines. Various secondary metabolites found in plants have been known to have vital role in most therapeutic activities of these plants and herbs. Accordingly plant and its products are safe and as a result there is perpetual utilization of plant product as a drug is found to be an alternative way to remedy the patients and this approach is in practice from the ancient times. Traditional treatments may provide valuable clues for the development of incipient oral hypoglycemic agents and simple dietary adjunct (Joshi et al., 2014). As one of consequential plant *Urticadioica* has been utilized for centuries for pabulum and medical purposes. Some plants have been shown to have protective antioxidant effects and are ergo hepatoprotective. Such plants are *Parkiaclapper toniana* and *Xylopia aethiopica*. There are following wild and edible plants which play a critical role as a component in neutraceuticals and herbal medicine (Amini et al., 2013).

WILD FRUITS AND THEIR ETHNOBOTANICAL USES

Rambans (*Agave americana* Linn.)

It is a shrub which contains sap which is known to have antiseptic, diaphoretic, diuretic and laxative properties and used as internal medicine for the treatment of diarrhea and dysentery. An infusion of the chopped leaf is purgative and juice of the leave is applied to bruises. The expressed juice of the leaves is administered by American doctors as a resolvent and alterative especially in syphilis and even various forms of cancers. It is considered to be laxative, diuretic and emmenagogue properties (a substance which increases menstrual flow). The fresh juice is applied to bruises and contusions. The gum found in exudation from the leaves and the lower part of the stem finds use in Mexico as a cure for toothache. The core is used medicinally in Cambodia. Its core is used medicinally in Cambodia. It is given internally as febrifuge in malaria and various other fevers. Externally it is applied to wounds as an antiseptic. The plant leaves usually heated and then split to apply in rheumatism affected bones to relieve chronic pain. An infusion of the cut-up leaves is used as a purgative (Ibrahim and Abd El Maksoud, 2015, Figure 1).

Figure 1. *Rambans* (*Agave americana* Linn.).

Khairwa (*Bauhinia purpurea* L.)

Flowers and buds (dried) are useful as laxative in piles and blood dystentry. Bark and root mixed with curd was found efficacious in diarrhea and haemorrhoids while its paste with dried ginger applied internally in the treatment of goiter. Flowers contain quercetin, astragalin, isoquercitrin, kaempferol-3-glucoside pelargonidin-3-glucoside and 3-triglucoside, 3-4-dihydroxychalcone-4-O-beta-L-arabinopyranosyl-O-beta-D-galactopyranoside, O-beta-D-galactopyranoside, Butein-4-O-beta-L-arabinopyranosyl-O-beta-D-galactoside, Phytohaemag glutinin (a trypsin inhibitor). Presence of amino acids and alkaloids have also been reported from the seeds. Anthocyanin, rutin, apigenin-7-o-glucoside were also found to occur (Hussain et al., 2014, Figure 2).

Figure 2. Khairwa (*Bauhinia purpurea* L.).

Kwairal (*Bauhinia variegata* Linn.)

The roots and bark are useful in vitiated conditions of pitta and kapha, diarrhoea, dysentery, skin-diseases, leprosy, intestinal worms, tumours, wounds, ulcers, inflammations, scrofula, proctoptosis, haemorrhoids, haemoptysis, cough, menorrhagia and diabetes. Young flowers are cooked as vegetable. Roots are carminative, decoction prevent obesity. Bark is anathematic and used in scrofula and coetaneous troubles Bark, roots, buds and gum are alterative, tonic and astringent, carminative and laxative. It is useful in haematuria and menorrhagia. Decoction of the roots prevents obesity. Bark preparations used in scrofuluoustumours (Kumar and Rana, 2012, figure 3).

Figure 3. Kwairal (*Bauhinia variegata* Linn.).

Hisalu (*Rubus ellipticus*)
Hisalu is a yellow colored small fruit which can be found mostly in summers in both Kumaon and Garhwal regions of Uttarakhand. The taste of hisalu makes one to wonder as it is difficult to say hisalu taste better or nectar! Hisalu is the unique and very tasty fruit of Uttarakhand. There are two types of Hisalu found, one is yellow colored and other is black colored. The yellow colored hisalu is common but black color hisalu is not so common. Hisalu has a sour and sweet taste. A well ripen hisalu tastes sweeter and less sour. This taste can not be compared to any other fruit. It plays a major role to providing free energy packets for the people who are travelling mountains and they can be finding them everywhere (Gusain and Khanduri, 2016).

Strawberry (*Fragaria ananassa)*
Used in prepared foods, flavored used in to dairy products, pigment extract used as a natural acid/base indicator due to the different color of the conjugate acid and conjugate base of the pigment. This fruit is a great source of iron.

Plum (*Prunus persica* L.)
Plums are used widely in the preparation of jellies, jams and desserts. People even use dry plums as dry fruit. Medicinally it is use in wound healing.

Kafal (*Myrica esculenta* Buch.)
Besides being useful in a wide range of ailments specified decoctions of fruits, the stone and also its bark are claimed to be beneficial in cardiac debility, edema and haemoptysis (coughing up the blood). A wax covering on the fruit can be extracted by scalding the fruit of the plant with boiling water. Among the local inhabitants it is said to be used as an application for ulcer healing.

Bedu (*Ficus palmata* Forssk.)
The Bedu fruit is very juicy and contain 45 percent of juice. The fruit is beneficial in the disease of lungs and the bladder. It is a source of minerals, phosphorus and a small amount of Vit. C.

Darim (*Punica granatum* L.)
It having a good amount of minerals, phosphorous, calcium and magnesium. Pomegranate fruit juice is known for its delicacy and is made into excellent homemade cold drink or sherbet which has diuretic and cooling effect and having glucose, fructose, tannins, oxalic acid, and reduces thirst and dehydration in cases of various feversand supplies the required minerals and helps the liver to preserve the storage of vitamin A. The peel of the fruit and the bark of Darim plant are used as a traditional remedy against diarrhea, dysentery and for treatment of various intestinal parasites (Bhowmik et al., 2013).

Berbrise (*Berberis asiatica* Roxb.)
In Ayurvedic medicinal system it is known as as 'Daruharidra" or as having similar properties as of turmeric so it is called as Wood Turmeric due to its antimicrobial, wound healing, hepatoprotective and cytotoxicity activities etc. The plant produces a good measure of plants alkaloids in which isoquinoline type alkaloids like berberine, palmatine, jetrorrhizine, and columbamine are the most studied phytoconstituents.

Makoi (*Solanum nigrum* L.)
It has expectorant, analgesic, sedative, diaphoretic properties. Its external application cures skin diseases and gives relief in burns, itching, pain etc. As per Ayurvedic system this plant is hot in potency and balances *tridosha*in physiological ailments. The extracted juice of leaves is used as ear drop to get relief from pain in auditory system and ears. It also contains a wide range of polyphenolic compounds such as gallic acid, catechin, protocatechuic acid, caffeic acid, epicatechin, rutin, and naringenin (Komal et al., 2011).

Ghigharu (*Pyracantha crenulata*)
Fruits can be made into a preservative. Medicinally it has cardio-tonic, coronary vasodilator and hypertensive properties. It has been used for cardiac failure, myocardial weakness, paroxysmal tachycardia, hypertension, arteriosclerosis and Burgor's disease. The anti-oxidants present in fruits are helpful in reducing the ill-effects of free-radicals in our body, maintain blood-pressure and reduce cholesterol. Apart from this the fruits are helpful for rejuvenation in aged people, reduce joint pains and act as appetizer. The leaves are used in the preparation of herbal tea, sun burn creams and many facial creams. The bark of the shrub is used in heavy bleeding during menstrual cycles. A combination of *Ginkgo* and *Pyracantha* leaves are known to act as a rejuvenating tonic to mind and nervous system. The stem bark is useful in many fevers especially in malarial pyrexia. It has adequate amounts of beta-carotene, iron, potassium, and anti-oxidants and therefore a healthy choice.

Apricot (*Prunus armeniaca* L.)
The fruit having high in carotene and vitamin C, provides a valuable source of food eaten fresh, as jams, dried or cooked in meat dishes. The kernels of the plants can also be eaten and pressed to extract high quality of almond oil or it can be used medicinally for various ailments. Recent studies suggest that the amygdalin extracted from apricot kernels can be used as an alternative treatment for cancer (Singh et al., 2007, figure 4).

Figure 4. Apricot (*Prunus armeniaca* L.).

Dog rose (*Rosa canina* L).
The plant has high quantity of antioxidants particularly the vitamin -C and it can be used to make syrup, tea and marmalade. Wildly it grows for the production of vit-C, The fruits have been used internally as tea for treatment of viral infections and disorders of the kidneys and urinary tract (figure 5).

Figure 5. Dog rose (*Rosa canina* L).

Mulberries (*Morus alba* L)

It is used from make jams or jellies add some lemon juice to perk up the flavor. The ripe fruit is palatable and it is extensively used in as essential component in pies, tarts, numerous wines, cordials and teas. Unripen fruit and other green parts of the plant have a white colored sap that may be toxic for consumption and it is known to have stimulating, or mildly hallucinogenic properties. Mulberry leaves, particularly those of the white mulberry, are ecologically important as the sole food source of the silkworm (*Bombyx mori*), Anthocyanins are water soluble pigments which are responsible for the attractive colors including orange, red, purple, black, and blue of fresh plant foods. These colors are since water-soluble and so they are easily extractable, yielding natural and non-toxic food col (Yousaf et al., 2013, figure 6).

Figure 6. Mulberries (*Morus alba* L).

Blackraspberry (*Rubus occidentalis* L.).

It has high amount of anthocyanins which is very useful for natural dyes and also beneficial for cancer treatment. The leaves can be used fresh or dried in herbal teas. It has astringent flavor and use in herbal medicine (figure 7).

Figure 7. Blackraspberry (*Rubus occidentalis* L.).

Timil (*Ficus auriculata* Lour.)

Gastrointestinal problems can be treated by using 50-100 ml fresh juice of leaves with water for about 10 days. Bark and root show hypoglycaemic and anthelmintic activity. The extracts also reported to inhibit insulinase activity from liver and kidney. Fruit extracts exhibits anti-tumour activity. Leaves exhibit hypotensive activity (figure 8).

Figure 8. Timil (*Ficus auriculata* Lour.).

Juneberries (*Amelanchier spicata* Lam.)
It can be eaten fresh as fruits or can be used for making jams, jellies, and sauce, and it is also used to make a fine beverage. Fruits have nutritional value because of high level of protein, fat, fiber, calcium, magnesium, manganese, barium, and aluminum (figure 9).

Figure 9. Juneberries (*Amelanchier spicata* Lam.).

Beal (*Aegle marmelos* L.)
The fruit is eaten fresh or dried. If fresh, the juice is strained and sweetened to make a drink and use for sharbat. The dried fruit is usually used for slice and sun-dried than hard leathery slices are immersed in water. The fruit pulp has detergent action. The beal fruit is employed to eliminate scum produced in vinegar-making (figure 10).

Figure 10. Beal (*Aegle marmelos* L.).

Ber (*Ziziphus jujube*).
Delicious fruits used as an effective herbal remedy. It increases the weight, stamina and improves muscular strength. In Chinese system of medicine, it is prescribed as a tonic to reinforcehepatic functions. It functions as antidote, diuretic, emollient and expectorant. Also, said to promote hair growth. The dried fruits are used as analgesic, anticancer, pectoral, refrigerant, sedative properties. It is also useful in treatment of stomachache, styptic (substance used to stop bleeding) andas general health tonic. Help in purify the blood and aid digestion. They are used internally in the treatment of cases of chronic fatigue, loss of appetite, diarrhea, anemia, irritability and hysteria disorders. The seed is hypnotic, narcotic, sedative, stomachache and tonic. It is used internally in the treatment of palpitations, insomnia, nervous exhaustion, night sweats and excessive perspiration. The root is used in the treatment of dyspepsia (indigestion). A decoction (*kaada*) of the root has been used in the treatment of various forms of fevers. The root can be crushed and made into a powder form and can be applied to old wounds and ulcers.

The leaves are applied as dressings and are helpful in liver troubles, asthma and fever. The fruit is very nutritious with potassium, phosphorus, calcium and manganese and also is rich source of Vit- C and Vit- B complex and anti-oxidant content of fresh fruits is higher than most of fruits (Bisht et al., 2013, figure 11).

Figure 11. Ber (*Ziziphus jujube*).

Wild grapes (*Vitis vulpina* L.)

The fruits are used in Juice, Wine and Jelly. Unripe grapes are used for treating sore throats, and raisins are given as treatments for consumption (tuberculosis), constipation and thirst. Ripen grapes were earlier used for the treatment of cancer, cholera, smallpox, nausea, skin and eye infections as well as kidney and liver diseases (figure 12).

Figure 12. Wild grapes (*Vitis vulpina* L.).

Red berries (*Viburnum opulus* L.)

It is used as an ornamental plant. In cooking, it is used as a cranberry substitute when making preserves and jellies. It can be eaten either raw or cooked, but use caution when using the berries of this plant in foods, as it can cause diarrhea, nausea and vomiting if eaten in large quantities or when unripe. Generally, if ripen and properly cooked, the fruit has very low levels of toxicity. The fruit also comprises a red color dye which was used by early Native Americans to make red ink. A decoction of the bark was also used as a beverage for both social drinking and medicinal purposes (figure 13).

Figure 13. Wild grapes (*Vitis vulpina* L.).

Blackcurrant (*Ribes nigrum* L.)

The extracted oil and juice useful as an antioxidant source and in treating rheumatoid arthritis and night and fatigue-related visual impairment, antimicrobial and anticancer properties. The Vit- C content is considered to be the major contributor to the antioxidant capacity of black currant. *In vitro* inhibition of cancer cell proliferation was observed with antioxidant capacity (figure 14).

Figure 14. Blackcurrant (*Ribes nigrum* L.).

Wild himalayan pear (*Pyruspashia)*

The juice of ripe fruit of pear is widely used in the treatment of diarrhea. The plant is well-known for its nutritional and therapeutic importance (figure 15).

Figure 15. Wild himalayan pear (*Pyruspashia).*

Indian fig (*Ficus carica* L.)

All parts used in the native system of medicine in different disorders such as colic, indigestion, diarrhea, sore throats, coughs, bronchial problems, inflammatory, cardiovascular disorders, ulcerative diseases, and cancers. The latex obtained from the sap of fig tree can be used to coagulate plant milks (figure 16).

Figure 16. Indian fig (*Ficus carica* L.).

Hill raspberry (*Rubus niveus)*

The fruits are used fresh, alone or they are served mixed with sugar and cream or as an ingredient of ice cream. They are exceptional for making pie, tarts, jam and jelly. The fresh fruit can be quick-frozen for future use (figure 17).

Figure 17. Hill raspberry (*Rubus niveus).*

Indian wild pear (*Amelanchier canadensis* L.)

The fruit contains about 6.8% sugars, 3.7% proteins, 1% ashes and about 0.4% pectin. Vit- C is very low, about 1.2 mg per 100g. The juice fruit is used in the treatment of diarrhea. Wood is used for small implements, walking sticks (figure 18).

Figure 18. Indian wild pear (*Amelanchier canadensis* L.).

Amla (*Phyllanthus emblica* L.)

The entire plant is economically important. The dried fruit, the nut or seed, leaves, root, bark and flowers are usually utilized for several purposes for health care. Both the ripe fruits and dried fruits are used. It has rich quantities in polyphenols and other minerals and is regarded as one of the richest source of vitamin C. Therapeutic uses as an energy refiller, Aperient, Antibacterial, antifungal, antiviral, in Gonorrhoea, Analgesic and Skin Fareness, to stop nausea and vomiting, Antitumour activity, Hepatoprotective activity (figure 19).

Figure 19. Amla (*Phyllanthus emblica* L.).

Karunda (*Carissa spinarum* L.)
Mundas, a tribe of Chhota Nagpur has used this plant in combination with roots of some other medicinal plants to treat rheumatism. It acts as a strong purgative agent and is used as one of the ingredients in some purgative preparations. A large dose of the roots of this plant is useful for the fatal owing to profuse purging (figure 20).

Figure 20. Karunda (*Carissa spinarum* L.).

Jamun (*Syzygium cumini* L.) Skeels
Fruit syrup is very useful for curing diarrhea. It is used in stomachaches and known to possess carminative and diuretic properties, apart from having cooling and digestive properties. Vit- C is able to regenerate other antioxidants such as vit- E. Fruits are used in making jam, jellies, squash, vinegar and ice cream for its beautiful and attractive purple colour (figure 21).

Figure 21. Jamun (*Syzygium cumini* L.) Skeels.

Imli (*Tamarindus indica* L.)
The fruit pulp is used for seasoning, as a food component to flavour confections, curries and sauces, and is a main component in juices and certain beverages. Fruit pulp of Imli is usually eaten fresh and often made into a juice, infusion or brine (figure 22).

Figure 22. Imli (*Tamarindus indica* L.).

Quince (*Cydonia oblonga)*

It has antioxidants activity and contains phenolic compounds, vit- E, carotenoids, L-ascorbic acid and other organic acids. The leaves are used in folk medicine for their sedative, antipyretic, anti-diarrheic and antitussive properties and for the treatment of various skin diseases. Dried fruits are used for making jelly and marmalade. Seeds have been used traditionally in diarrhea, dysentery, cough, sore throat and bronchitis, intestinal colic and constipation and also are one of the popular complementary therapies used for allergic rhinitis and asthma (figure 23).

Figure 23. Quince (*Cydonia oblonga).*

Kilmora (*Berberis asiatica*)

The alkaloids present in the plant are Berberine and Palmatine which are present as chlorides. The fresh roots are used for curing diabetes and jaundice. The alkaloid content within the roots is about 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 (Sharma et al., 2014, figure 24).

Figure 24. Kilmora (*Berberis asiatica*).

Semal (*Ceiba pentandra* Linn.)

The roots are known to have diuretic, aphrodisiac, antipyretic and tonic and are useful in gonorrhea, dysuria, intermittent fevers and vitiated conditions of pitta. The bark is acrid, bitter, thermogenic, diuretic, febrifuge, emetic, purgative and tonic and is useful in hepatopathy, splenopathy, abdominal complaints, tumours, constipation, strangury, flatulence, lochiorrhoea, colic and vitiated conditions of vata and kapha. The leaves are used as acalming agent and the decoction of the flowers is used as a laxative (figure 25).

Figure 25. Semal (*Ceiba pentandra* Linn.).

Ganziadi (*Chaerophyllum villosum* Wall.)
Plant yield essential oil 0.98% and sitosterol. It is laxative, anthemintic, diuetic, sphrodisac and is useful in vitiated conditions of pitta, peptic ulcer, helminthiasis, dyspepsia, flatulance, strangury, seminal weakness, phyaryngopathy, splenopathy, faemorrhoids, ophthalmopathy, cardic disorders and general debility (figure 26).

Figure 26. Ganziadi (*Chaerophyllum villosum* Wall.).

Gadper (*Colocasia esculenta* Linn.)
The leaf juice is styptic, stimulant and rubefacient which finds ude in internal haemorrhages, otalgia, otorrhoea, adenitis and buboes. The juice of the corn is laxative, demulcent, and anodyne finding uses in somatalgia, alopecis, areta, haemorrhoids and congestion of the portal system. The pressed juice of the prtioles is styptic and may be used to arrest arterial haemorrhage. It is some times used in earache and as an external stimulant and rubefacient. The juice expressed from the leaf stalk is used with salt as an absorbent in case of infamed glands and buboes. The use of the corn is used in cases of alopaecia. Internally it acts as a laxative and is used in cases of piles and congestion of the portal system, also an antidote to the strings of wasps and opthe insects (Kaur, 2015, figure 27).

Figure 27. Gadper (*Colocasia esculenta* Linn.).

The plant is a good source of provitamin A and Vitamin C (leaves and petioles), cartene, Vitamin B, Vitamin C, hemicellulose and mucilage-both yielding d-galactose and 1-arabinose: 2α-amylase inhibitor sterols, trypsin inhibitors (tubers): 3,4-diglucosidic benzaldehyde isolated from the plant.

Genthi (*Dioscorea bulbifera*)
The tubers contain furanoid, norditerpenoids and are used in piles, dysentery and syphilis. In dried powered form, are applicable in ulcers. The rhizomes are considered anorexiant. It's ethyl alcohol (50%) extract of aerial part is used as diuretic (figure 28).

Figure 28. Genthi (*Dioscorea bulbifera*).

Lingura (*Diplazium esculentum* Retz.)

The grains are recommended as as a diet in incolic, choleraic, diarrhea, fluxes and abdominal obstructions. Hot CH3OH (90%) extraction, washing with CHCl3 and recrystallization from H2O gives rutin 4 to 8.5%. Rhizome used in treatment of pulmonary Abscess: active principal 5,7,3,4- tetra-OH-flavan-3-ol (figure 29).

Figure 29. Lingura (*Diplazium esculentum* Retz.).

Halang (*Lepidium sativum* Linn.)

The roots of Lepidium are bitter and pungent and are useful in treatment of secondary syphilis and tenemus. The leaves are stimulants, diuretic, and antibacterial being useful in scobutic diseases and Hepatopathy. The seeds are bitter, thermogenic, depurative, rubefacient, galactagogue, emmnagogue, aphrodisiciac, ophthalmic and diuretic. The are useful as poultices for sprains and in leprosy, skin diseases, dysentary, diarrhea, splenomegaly, dyspepsia, lumbabo, ophthalmopathy, leucorrhoea, scury, seminal weakness, asthma, cough, hiccough, leucorrhoes, haemorrhoids and vilated conditions of vata. It can be administered to cause abortion (Altun et al., 2009, figure 30).

Figure 30. Halang (*Lepidium sativum* Linn.).

Sonjal (*Moringa oleifere* Lam.)

The roots are bitter, acrid, thermogenic, digestive, carminative, anthelmintic, constipating, anodyne, anti-inflammatory, emmenagogue, sudorific, diuretic, ophthalmic, rubefacient, expectorant, haematinic, antilithic, alexipharmic, stimulant, and vesicant.they are useful in violated conditions of vata and kapha, dyspepsia, anorexia, verminosis, diarrhea, colic, flatulense, otalgia, paralysis, inflammation, amenorrhoea, dysmenorrheal, fever, strangury, vesical, renal calculi, ascites, ophthalmopathy, cough, asthma, bronchitis, pectoralm diseases, splenomegaly, epilepsy, hysteria, cardiopathy, abscess and pharyngodynia.

The bark is arid, bitter, thermogenic, abortifacient, antifungal, cardiac, and circulatory stumulant. Sonjan finds use in ascites, vitiated conditions of vata and kapha and rimgworm. The leaves are anti-inflammatory, anodyne, anthelmintic, ophthalmic and rich in Vitamin A and vitamin C.they are useful in scurvy, vitiated conditions of vata and kapha, wounds, tumours, inflammations and helminthissis. The seeds are pungent, bitter, analgesic, anti-inflammatory, purgative, antipyretic and ophthalmic (Nielsen et al., 2003, figure 31).

Figure 31. Sonjal (*Moringa oleifere* Lam.).

Machhai (*Nasturtium officinale* RBr.)

It is consumed uncooked and raw as salad, sometimes boiled and cooked as vegetable. Chopped leaves are incorporated fruit and vegetable juice cocktails, soups and biscuits. It possesses antiscorbutic and stimulant properties and is eatern to improve appetite. A decoction of the plant is given as a blood purifier, vermifuge and diuretic. Water cress is consumed raw as salad. It also finds use in garnishing various dishes. It is sometimes bolied and cooked as vegetable. Chopped leaves are incorporated in cocktail juices of fruits and vegetables, soups and biscuits (figure 32).

Figure 32. Machhai (*Nasturtium officinale* RBr.).

It possesses antiscorbutic and stimulant properties and is eaten to improve appetite. It is abundant source of vitamins and minerals. Analysis of water cress gave the following values: moisture 89.2; protein 2.9; fat 2.9; carbohydrate 5.5; mineral matter 2,2%. Ca 290, P 140, Fe 4.6 mg/100g.

It is rich source of Vitamin A (4720IU) and E and also ascorbic acid (77mg/100g), thiamine 0.08, riboflavin 0.16, niacin 0.8, biotin 0.5mg/100g. on a large scale, Vitamin A is used to correct its deficiency.

Water cress is reported to be useful in strangury and goiter. Its juice is used as a cure for polypus of the nose. It possesses antibacterial properties and used in dry throat and headache, asthma, and tuberculosis. Preparation of the plant is given as a blood purifier, vermifuge and diuretic (Olsson et al., 2004).

Koda (*Paspalum scrobiculatum* Linn.)

The grains are sweet bitter, astringen, cooling, constipating, diuretic, sedative, alexeteric (anti-infection) and stypic. They are medicinally useful in treatment of various ulcers, flatulence, strangury, diarrhea, hallucination, inflammation, hepatopathy, hemorrhages, vitiated conditions of pitta, burning sensation and general debility. The stem is useful for corneal opacity (figure 33).

Figure 33. Koda (*Paspalum scrobiculatum* Linn.).

Jarag (*Phytolacca acinosa* Roxb.)

The roots are sweet, refrigerant, emollient, laxative, aphrodisiac, galactogogue, diuretic, rejuvenating, emetic, cardiotonic, alterant, expectorant and febrifuge. It is useful in viated conditions of pitta and vata, arthritis, burning sensation, constipation, agalactia, emaciation, cardiac, intermittent fevers, pharyngitis, leprosy, dyspepsia, tuberculosis, hepatospenomegaly, cough, spermatorrhoea and general debility (figure 34).

Figure 34. Jarag (*Phytolacca acinosa* Roxb.).

Burans or Laligurans (*Rhododendron arboreum*)

Leaves of this plant are used to cure uterine hemorrhages, bleeding from nose and blood vomiting, and regulate menstrual period. The leaves are rich in vitamin A and C are considered useful in scurvy and catarrhal affections. They are also used as emetic. The flowers are used as diuretic, and cholagogue. The seeds are considered antipyretic, acrid and bitter. The seed oil is used as application in rheumatism and gout (figure 35).

Figure 35. Burans or Laligurans (*Rhododendron arboreum*).

SIGNIFICANCE

Himalayan herbal medicine and their old knowledge is a good example of poor communities residing in remote areas, fighting even incurable diseases trough the traditional methods and even for their livestock through these traditional herbal medicines. Medicinal plants are natural resources for new drugs. Parts of plants are directly used as medicines by a majority of communities in all over world and have no side effects like allopathic medicines. Most of the modern allopathic medicines are produced indirectly from constituents of these plants (Arya et al., 2011).

Most of the Uttarakhand is mountainous and is blessed with variety of fruits among them wild fruits play a major role as they serve as the energy giving packets for the people drifting in mountains as they can be found everywhere. Nutraceutical products are presently receiving recognition as being beneficial in coronary heart diseases. Obesity, diabetes, osteoporosis, cancer, osteoporosis and other chronic and degenerative diseases viz. Parkinson's and Alzheimer's diseases.

Scientific evidences indicate that the physiological actions of natural compounds involve a wide array of biological processes, including activation of antioxidant defenses, signal transduction pathways, cell survival-associated gene expression, cell proliferation and differentiation and preservation of mitochondrial integrity. It appears that these properties play a vital role in the protection against the pathologies of numerous degenerative and age-related chronic diseases (Gilani et al., 2008).

It is very imperative that the nutrients found in many foods, fruits and vegetables are responsible for the well-documented health benefits. For example, lutein and zeaxanthin prevent eye cataracts and macular degeneration; beta-carotene and lycopene protect the skin from ultraviolet radiation damage; likewise lutein and lycopene may benefit cardiovascular health and lycopene may help to prevent onset of prostate cancer. Because of these and other marked health benefits of these, it must be taken regularly and to reduce the risk factors like high cholesterol, high blood pressure and diabetes. Some of the most popular nutraceutical products marketed today are based botanical products such as St. John's wort, echinacea, ginkgo biloba, saw palmetto and ginseng (Ahmad et al., 2015).

Many industries manufacture and market the nutraceuticals, where the side effects (especially consumed in large quantities) of these nutraceuticals not reported or often unproven. In order to have scientific knowledge about the nutraceuticals, publics should be educated, where recommended daily doses of these nutraceuticals should be known by each consumer (Bhide and Nitave, 2014). With the rapidly increasing interest in the nutraceutical revolution, we need to establish a vibrant nutraceutical research community which is absolutely necessary to convert the majority of potential nutraceuticals to established ones thereby truly delivering their enormous benefits to all of us (Krishnaveni and Mirunalin, 2011). The list of nutraceuticals being studied is changing continually and reflects ongoing research, market developments and consumer interest (Carr and Frei, 1999, Sharma et al., 2017).

CONCLUSION

Wild fruits are worldwide distributed but in very low quantity. Wild fruiting plants are generally in majority in that place which is not affected by human interaction due to their difficult geography and climatic conditions which is not suitable for human survival. Uttarakhand is one of these places which is suitable for wild edible fruiting plants because of their difficult geography and climatic conditions and awesome taste of fruits which is attracted by their people as a rich source of their nutrition. The unique diversity of such important plants in the region is manifested by the presence of a number of native, endemic and threatened of total red data book species of Indian Himalayan region.

Uttarakhand is characterized by a rich diversity of ethnobotanic plant as well as rich heritage of wild edible plants system. These important floras are preserved by the local population of Kumaun and Garhwal region. The traditional knowledge about the use of indigenous medicinal plants has been explore, therefore, the ethnological knowledge of people and listing of plants of particular region are important tools that may help in understanding human environment interactions. Consumption of wild edible fruits meets the protein, carbohydrates, fats, vitamin and mineral requirement of poor rural populace in the region. Wild edible plants are very important for the well being of rural populations in the region, not only as sources of supplemental food, nutritionally balanced diets, medicines, fodder and fuel, but also for their income generating potential. Many wild fruits such as *Rubus ellipticus, Fragaria ×ananassa, Prunus persica, Myrica esculenta* etc. have high nutritive quality and used by the local peoples for different edible products. Among these many other wild fruits such as *Punica granatum, Bebrise asiatica, Solanum nigram, Ficus auriculata* etc. have been reported for the good medicinal properties.

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