

RESEARCH ARTICLE

Wild edible plants used by ethnic communities in Kalimpong district of West Bengal, India

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ABSTRACT

Ethnobotanical studies on wild edible plants of Kalimpong district was carried out during July 2017-August 2018. A total of 86 wild edible plant species belonging to 47 families and 71 genera are enumerated, out of which there are 39 trees, 29 herbs, 11 climbers and 7 shrubs which are used by local people for food and medicine and some are intimately associated with their indigenous traditions and culture. From the market survey it was found that about 53% of these recorded wild edible plants have economic potential and contribute in improving economic status of rural communities.

KEYWORDS: Wild edible plants, traditional knowledge, Kalimpong district, West Bengal.

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Introduction

“Wild edible plants” are referred to those plants which can be used as food if collected at appropriate stage of growth and properly prepared (Kallas, 2010). Since pre-historic times, man has known to have identified the plants as their food from the natural stands. Man has the intelligence edge over other animals and hence is able to screen the edible and poisonous plant parts by the process of trial and error methods. Wild edible plants play a vital role in providing food for poor rural people mainly tribal residing at the vicinity of the forests. Wild edible plants are important in the livelihood strategies of forest dwellers/tribal populations. While these foods are not widely accessible, locally they are of great relevance for nutrition and food security in many countries mainly China, India, S.E. Asian countries, Africa, Australia several wild edible plants are consumed along with domesticated plant species (Mazhar *et al.*, 2007). Edible wild plants were always been used as the earliest food sources that provided human race the required energy for their growth, development and multiplication (Rai *et al.*, 2012). India has a tribal population of 42 million, of which ca. 60% live in forest areas and depend on forests for various edible products (Jana & Chauhan, 1998). In many situations, wild foods are not dietary staples, generally they provide valuable nutritional supplements in the form of ingredients, vegetables and beverages, many plants used in

industrialized countries today were originally identified and developed through indigenous knowledge (Yesodharan & Sujana, 2007). Consuming wild edibles is a part of the food habits of people in many societies and intimately connected to all aspects of their socio-cultural, health care and spiritual life (Singh *et al.*, 2006). They depend on forest not only for food but depend equally for medicine as well. It plays a major role in meeting the nutritional requirement and part of health management system of the tribal population particularly in remote parts throughout the year where modern amenities are still lacking.

Knowledge of non-domesticated food resources is a part of traditional and unstated ecological knowledge, and is largely transmitted through socialization within cultural and household contexts (Setalaphruk & Lisa, 2007). According to Rasingam (2012), the contributions of forest foods that make food security can be categorized into three main ways i) providing a supplementary source of food, ii) as seasonal foods in the diet, and iii) as an emergency food supplies during periods when others are unavailable.

Tribal groups living in present study area are Lepcha, Bhutia, Limboo, Tamang etc. along with non-tribal Nepali populations. These people living with nature since time immemorial have got substantial indigenous knowledge of wild edible plants and possess their indigenous knowledge

of identifying edible plant parts such as roots, tubers, rhizomes, leaves, fruits, seeds, tender shoots etc. Thus, these ethnic groups depend on non-timber forest products for their sustenance. While considering single tribe 'Lepcha' from the study site they depend mostly on wild plants for their medicine as well, out of 75 medicinal plants identified which are used by this community from the area, 72% were found to be wild (Chhetri and Rai 2018). It has been found that many wild edible plants occurring at study site are nutritionally rich which can provide nutritional supplement to the local communities (Sundriyal & Sundriyal, 2003; Pradhan, 2013; Singh *et al.*, 2014; Nallakurumban *et al.*, 2015; Pradhan & Taman, 2015). Nutritional analysis of some wild edible plants demonstrates that in some cases they are superior to domesticated varieties (Orech *et al.*, 2007; Kabuye, 1997). Still there are large numbers of plant species which are less known as wild edibles or can be utilized as substitute of many traditionally used plants, can be used to fulfill nutritional requirement of growing population of the world. They fulfill most of their needs from wild resources. This traditional knowledge is useful to develop new food sources (Reddy, 2011). Hence, exploration of natural resources and documentation of traditional knowledge of indigenous communities is essential before fading away with modernization. Wild edible plants have much potential in socio-economic upliftment of the rural population. The objective of the present study is therefore to document all the available wild food plants and their socio-economic aspects among rural people keeping in view the current scenario of changing food habit and growing ignorance of existing nutritious native wild food plants by younger generation and urban population. Hence, the study has also been taken up in order to bring into focus that continues ignorance of wild food plants will lead to decrease in sustainable usage of forests affecting socio-economy of rural communities and gradual loss of associated traditional knowledge system. It is also imperative to state that documentation of present knowledge of wild edible will help to formulate conservation strategies for many of the less known wild edible plants and also to make them utilize in the mainstream practices for the sustenance of the local people.

Materials and methods

Kalimpong district of West Bengal is located at 27° 01' 19.85" N latitude and 88° 33' 57.91" E longitude at an average elevation of 1250 m above sea level. The vast rural area is inhabited by different communities *viz.* Lepcha,

Bhutia, Limboo and Nepali. The wild edible plants were studied from the remotely located places of Samthar, Kaffer and Lava areas in Kalimpong district where people still depend on forests for their sustenance. The study was conducted during July 2017 – August 2018 covering different seasons. Data was gathered with the help of structured questionnaire, semi directive interviews, and group discussions with native people. Market survey has also been conducted at Samthar local hat and Kalimpong main market where these wild plants are brought from different villages and sold. The wild plants thus recorded were cross checked with different informants involving sales persons, primarily on parts used, mode of consumption and cultural values if any. These collected data were again verified consulting available literature (Sundriyal *et al.*, 1998; Rai *et al.*, 1998; Rai *et al.*, 2012; Sharma, 2012; Yonzon *et al.*, 2012; Tamang *et al.*, 2017; Chhetri & Rai, 2018). Local names were recorded along with habit, edible parts, mode of use and ethno-medicinal values if any. Correct botanical names and families were updated using <http://www.theplantlist.org> and <http://www.tropicos.org>.

Results and discussion

From the present study it has been found that the Kalimpong district areas are rich in wild plants, which have immense potential for human consumption contributing positively towards its economy and livelihood for the different communities. A total of 86 wild edible plant species belonging to 47 families and 71 genera has been identified, enumerated and discussed in present paper. Botanical names of the plant species arranged alphabetically along with local names, habit, family, parts used, mode of use and medicinal values if any is presented in table 1. Diversity in the habit was recorded as trees (39 species) followed by herb (29 species), climbers (11 species) and shrub (7 species) respectively (Fig.1). The Fig family or family Moraceae occupies the dominant position with 6 species followed by Yam family or Dioscoreaceae and Rosaceae (5 species each), Fabaceae, Lauraceae and Rutaceae (4 species each), Amaranthaceae, Anacardiaceae, Fagaceae, Solanaceae and Urticaceae (3 species each) and the rest represent 1 to 2 species each. While considering edible parts of the plants, mostly consumed part was found to be the fruits which represent 41 species followed by young shoots (11 species), leaves (10 species), flowers/inflorescence (9 species), tubers (7 species), seeds (5 species) and nuts (3 species) (Fig. 2). The wild edible plants recorded from the study area were

commonly used as vegetables for preparing curry, soups and pickles locally called '*achaar*', among these many of them are used for medicinal purposes due to their curing properties for many ailments, some are eaten raw, some consumed after boiling and many of them are taken as alternatives during food scarcity. From the present study it was found that 93% of total plants recorded have medicinal values and mostly used for common ailments like stomach disorders, controlling blood sugar level, high blood pressure, etc. From the market survey it was found that a total of 46 wild edible plants have commercial value among locals and are commonly sold in the local markets or even taken to nearby bigger markets. Commercially important wild food plants include mostly fruits (Fig. 3) and vegetables (Fig. 4). Market price of the remote Samthar market with Kalimpong town has also been compared and found that selling price of these plants attain double to triple while reaching urban areas. It has been noted that some of these wild edible plants are restricted to the rural communities and not much popular in urban markets mention may be made of some fruits and vegetables like *Amaranthus spinosus*, *Myrica esculenta*, *Solanum nigrum*, etc. List of commercially important wild edible plants, along with local names, parts used, market price near natural habitat (Samthar) and away from natural habitat, (Kalimpong town) and available season is presented in Table 2.

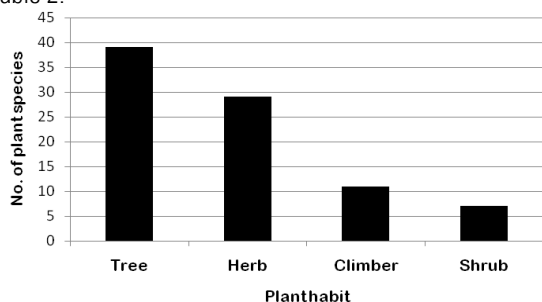


Figure 1. Habit wise representation of wild edible plants from study area.

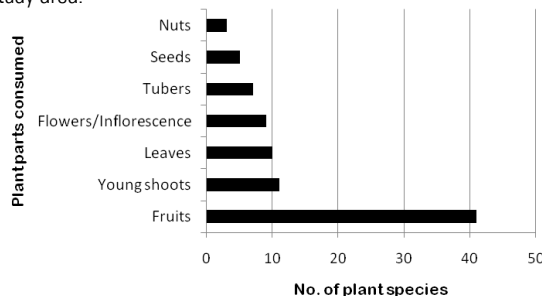


Figure 2. Use frequency of different wild edible plant parts in study area.

Conclusion

With the increasing population pressure people have to depend on wild edible plant resources as alternative source against the conventional ones in near future to cope up with the increasing demand of food and to fulfil nutritional requirement. Thus the plant resources play a vital role to sort out various problems related to shelter, food, medicine etc. Beside this, many of these wild edibles have immense cultural value among the local inhabitants and consequently associated with their indigenous traditions. Traditional practices like boiled tubers of *Dioscorea* species along with different varieties of tubers like *Manihot esculenta* (*Simal taru*), *Colocasia esculenta* (*Pindalu*), *Ipomoea batatas* (*Sakarkhanda*) etc. are consumed in *Maghey Sankrati* or *Makar Sankrati* during the month of January by Nepali community, small piece of raw *Dioscorea hamiltonii* (*Bantarul*) is pasted on forehead before taking the boiled tubers to celebrate the occasion. Similarly, fruits of *Juglans regia* (*Okhar*) are used during '*Bhai Tika*' festival which is celebrated two days after *Dipawali* by Nepali community while putting *Bhai tika* by sisters to their brothers. During such festivals and occasions the market price of these items used to be high, even local inhabitants buy them to complete their traditional rituals/festivals. Likewise, seeds of *Oroxylum indicum* possess immense socio-religious importance among those tribes who follow Buddhism viz. Lepcha, Bhutia, Tamang etc. they consider *Oroxylum indicum* as most sacred and use its seeds in their every socio-religious rituals. These practices not only have traditional or cultural significance but also have immense scientific significance which needs to be promoted and conserved before it got lost among the new generations.

Some rural communities have already started cultivating many of the wild species for self consumption and marketing. This activity ensures easy access of materials whenever needed and many of the tree species also accomplish fodder and fuelwood requirements in time to the local communities (Rai *et al.*, 2012). These species include *Aegle marmelos*, *Allium hookeri*, *Baccaurea ramiflora*, *Bauhinia purpurea*, *Bauhinia variegata*, *Choerospondias axillaris*, *Cinnamomum tamala*, *Cyphomandra betacea*, *Dioscorea alata*, *Diploknema butyracea*, *Eriolobus indica*, *Eryngium foetidum*, *Ficus auriculata*, *F. lacor*, *F. subincisa*, *F. semicordata*, *Guizotia abyssinica*, *Juglans regia*, *Litsea cubeba*, *Machilus edulis*, *Mentha spicata*, *Momordica cochinchinensis*, *Morus spp.*,



Figure 3. Some common wild edible fruits sold at local markets of Kalimpong, a. *Baccaurea ramiflora* Lour., b. *Calamus erectus* Roxb., c. *Diploknema butyracea* (Roxb.) H.J. Lam., d. *Juglans regia* L., e. *Machilus edulis* King ex Hook.f., f. *Terminalia bellirica* (Gaertn.) Roxb.



Figure 4. Some common wild edible vegetables sold at local markets of Kalimpong, a. *Amaranthus viridis* L., b. *Dendrocalamus hamiltonii* Nees & Arn. ex Munro, c. *Girardinia diversifolia* (Link) Friis, d. *Diplazium esculentum* (Retz) Sw., e. *Oroxylum indicum* (L.) Kurz., f. *Phlogacanthus thyriformis* Nees.

Table 1. List of wild edible plants recorded from study areas of Kalimpong.

Sl.no	Botanical name	Local name	Habit	Family	Edible parts	Mode of use	Ethno-medicinal value
1.	<i>Aegle marmelos</i> (L.) Correa	Bel	Tree	Rutaceae	Fruit	Ripe fruit pulp is eaten raw	Effective to cure diarrhoea and gastric problems
2.	<i>Allium hookeri</i> Thwaites	Dungdug	Herb	Amaryllidaceae	Leaves	It is cooked as vegetable and consumed	Act as tonic to digestive system, beneficial for circulatory system
3.	<i>Amaranthus viridis</i> L.	Lattey sag	Herb	Amaranthaceae	Leaves	Tender shoot used as vegetables	Good for diabetics, helps in controlling diarrhoea
4.	<i>Amaranthus spinosus</i> L.	Ban Lude	Herb	Amaranthaceae	Leaves	Tender shoots used as vegetables	Beneficial for anemic
5.	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Gurbo/Oal	Herb	Araceae	Young stem and leaf	Young shoots are firstly boiled, thrown away water to remove raphides, then cooked as vegetable	Effective in stomach problems
6.	<i>Baccaurea ramiflora</i> Lour.	Kusum	Tree	Phyllanthaceae	Fruits	Ripe fruits taken raw	Helpful in constipation and high source of vitamin "C". Good source of natural antioxidants (Singh et al. 2014)
7.	<i>Basella alba</i> L.	Poi Sag	Climber	Basellaceae	Young leaves	Young leaf and shoots are cooked as vegetables	Useful in stomach disorder
8.	<i>Bauhinia purpurea</i> L.	Tanki	Tree	Fabaceae	Flowers, Roots, Bark	Flowers cooked as vegetable	Flowers are considered as laxative, eaten as vegetables to cure stomach ache and diabetes, bark is taken to control diarrhea, roots are carminative
9.	<i>Bauhinia variegata</i> L.	Koirala	Tree	Fabaceae	Flower	Used as vegetables	It helps to control blood pressure
10.	<i>Calamus erectus</i> Roxb.	Betgera	Shrub	Arecaceae	Fruits, young shoots	Raw fruits are eaten, tender shoots are boiled and cooked as vegetables	Anti- diabetic
11.	<i>Castanopsis hystrix</i> Hook.f. & Thomson ex A. DC.	Patle katus	Tree	Fagaceae	Fruit nut	Nuts eaten directly without cooking or taken after roasting	Good source of carbohydrate
12.	<i>Castanopsis indica</i> (Roxb. ex Lindl.) A. DC.	Jat katush	Tree	Fagaceae	Fruit nut	Nuts usually eaten without cooking, also consumed after roasting	Good source of carbohydrate
13.	<i>Castanopsis tribuloides</i> (Sm.) A. DC.	Musure katus	Tree	Fagaceae	Fruit nut	Roasted nuts are eaten directly	Good source of carbohydrate
14.	<i>Chenopodium album</i> L.	Bethusag	Herb	Amaranthaceae	Leaves/ twigs	Cooked and taken as vegetable	Good appetizer, taken to cure constipation and body pain
15.	<i>Choerospondias axillaris</i> (Roxb.) Burt & Hill	Lapsi	Tree	Anacardiaceae	Fruits	Fruits are eaten raw, commonly used to make pickles	Effective against blood dysentery and good appetizer. Good source of natural antioxidants (Singh et al. 2014)
16.	<i>Cinnamomum tamala</i> (Buch-Ham.) T. Nees & Eberm.	Tejpatta	Tree	Lauraceae	Dried leaves	Used as condiment	Good in hyper-tension and cardiac disorder and also used as spices
17.	<i>Cinnamomum verum</i> J. Presl	Sinkauli	Tree	Lauraceae	Dried bark	Used as Condiment	Useful in diarrhea, controlling blood sugar level and cholesterol level and also used as spices.

18.	<i>Cissampelos pareira</i> L.	Batulpate	Climber	Meniperaceae	Young shoot	Used as vegetables	Usually consume by diabetic patient.
19.	<i>Citrus medica</i> L.	Bimbira	Tree	Rutaceae	Fruits	Used to make pickle, salads	Good in digestive disorders, piles and good source of vitamin "C"
20.	<i>Colocasia esculenta</i> (L.) Schott	Pindalu	Herb	Araceae	Tubers	Matured tubers are boiled in water and consumed with salt or chutney, tender shoots as vegetable	Considered as good appetizer and also useful in constipation. Tender shoots are good in anemia
21.	<i>Cyphomandra betacea</i> Sendt.	Rukh tamatar	Shrub	Solanaceae	Fruits	Boiled and make chutney or Pickled and store for future use	Appetizer, good source of vitamins, calcium, iron, potassium, phosphorus and magnesium (Nallakurumban et al., 2015)
22.	<i>Dendrocalamus hamiltonii</i> Nees & Arn. ex Munro	Choya Bans/Tama	Herb	Poaceae	Young shoot	Young shoots are mixed with turmeric powder or ash and boiled for 30-35 min. Later cooked as vegetable	Good source of dietary fiber and source of carbohydrate
23.	<i>Dioscorea alata</i> L.	Ghar tarul	Climber	Dioscoreaceae	Tubers	Boiled in water and taken with salt, also cooked as vegetable	Good source of carbohydrate, and controls stomach problems
24.	<i>Dioscorea bulbifera</i> L.	Gittha	Climber	Dioscoreaceae	Tubers, fruits	Matured tuber and fruits are boiled in water and consumed	Good source of carbohydrate and tuber used against stomach disorder and intestinal worms
25.	<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Bhyakur	Climber	Dioscoreaceae	Tubers	Boiled in water and consumed	Good source of carbohydrate and good for stomach troubles
26.	<i>Dioscorea hamiltonii</i> Hook.f	Bantarul	Climber	Dioscoreaceae	Tubers	Boiled in water and consumed	Helps in digestion
27.	<i>Dioscorea pentaphylla</i> L.	Rani Bhyakur	Climber	Dioscoraceae	Tubers	Matured tubers are boiled in water for 20-25 minutes and then eaten.	Good source of carbohydrate effective against stomach disorder and intestinal worms problem
28.	<i>Diplazium esculentum</i> (Retz) Sw.	Chiplep ningro	Herb	Athyriaceae	Young fronds	Young fronds are cooked and taken as vegetable	Good source of dietary fibre and protein, effective in constipation, blood dysentery and stomach disorders
29.	<i>Diploknema butyracea</i> (Roxb.) H.J. Lam	Chewri	Tree	Sapotaceae	Fruits, Seed	Ripe fruits consumed directly	Beneficial in diabetes and stomach problems
30.	<i>Dryopteris cochleata</i> (D. Don) C. Chr.	Danthe ningro	Herb	Dryopteridaceae	Young shoots	Used as vegetables and pickle.	Appetizer
31.	<i>Duabanga grandiflora</i> (DC.) Walp.	Lampatey	Tree	Lythraceae	Flower and young shoots, bark	Flowers and young shoots boiled and cooked as vegetable	Bark is used against stomach pain and disorders
32.	<i>Elaeagnus latifolia</i> L.	Musleri/ Maldhero	Shrub	Elaeagnaceae	Fruits	Ripe fruits consumed fresh, mostly used for making pickles, jam etc.	High source of vitamin "C" and minerals and appetizer
33.	<i>Elaeocarpus Sikkimensis</i> Mast.	Bhadrase	Tree	Elaeocarpaceae	Fruits	Ripe fruits consumed raw	High source of vitamin "C" and minerals and considered as appetizer
34.	<i>Entada gigas</i> (L.) Fawc. & Rendle	Pangra	Climber	Fabaceae	Fruits	Seeds are roasted and eaten	Seed paste applied on scalp and wash to remove dandruff
35.	<i>Eriolobus indica</i> Schn.	Mehel	Tree	Rosaceae	Fruits	Pickle	Fruit extract taken to cure blood dysentery (Suresh

36.	<i>Eryngium foetidum</i> L.	Bhote dhania	Herb	Apiaceae	Leaves	Fresh leaves used as flavoring agent in soup, sauces, etc.	et al. 2014) Appetizer. Juice extracted from aerial part is taken in stomach troubles, gastritis, cold and cough.
37.	<i>Fagopyrum dibotrys</i> (D. Don) Hara	Banphapar	Herb	Polygonaceae	Aerial part	Leaves are boiled steamed or cooked as vegetables. Dried seeds to make flour and traditional pan cakes are prepared called <i>pakora</i> etc.	Good source of carbohydrate and useful in diabetes, hypertension and abdominal obstructions
38.	<i>Ficus auriculata</i> Lour.	Nebara	Tree	Moraceae	Fruits	Ripe fruits are eaten raw	High source of dietary fibre, natural sugar, minerals and effective as appetizer, beneficial in diabetes
39.	<i>Ficus hirta</i> Vahl	Khasreto	Tree	Moraceae	Fruits	Ripe fruits are eaten directly	High source of dietary fibre, natural sugar, minerals and effective as appetizer, beneficial in diabetes
40.	<i>Ficus lacor</i> Buch.-Ham.	Kabra	Tree	Moraceae	Leaf buds	Young unopened leaf buds are boiled to make pickles	High source of dietary fibre, natural sugar, minerals and effective as appetizer, beneficial in diabetes and useful in stomach related disorders
41.	<i>Ficus semicordata</i> Buch.Ham. ex Sm.	Khasre khanew	Tree	Moraceae	Fruits, latex	Ripe fruits are eaten directly	Fruits appetizer, latex applied on fresh wounds and boils to prevent infection
42.	<i>Ficus subincisa</i> Buch.-Ham. ex Sm.	Lutay khanew	Tree	Moraceae	Fruits	Ripe fruits are eaten	High source of dietary fibre, natural sugar, minerals and effective as appetizer
43.	<i>Fragaria nubicola</i> (Hook.f.) Lindl.ex Lacaita	Bhui aiselu	Herb	Rosaceae	Fruits	Ripe fruits are directly eaten	Good source of minerals and ripe fruits taken against anaemia and diabetes
44.	<i>Girardinia diversifolia</i> (Link) Friis	Bhangre sisnu	Herb	Urticaceae	Inflorescence	Cooked as curry	Good in high blood pressure
45.	<i>Guizotia abyssinica</i> (L.f) Cass.	Philunge	Herb	Asteraceae	Seeds	Seed powder used for making traditional ' <i>Dhulo Achar</i> '	Appetizer. Oil extracted from seeds applied externally to treat rheumatism
46.	<i>Heracleum wallichii</i> DC.	Chimphing	Herb	Apiaceae	Fruits	Used as pickle	Good appetizer. Dried fruits decoction taken in stomach disorder, cough and cold
47.	<i>Houttuynia cordata</i> Thunb.	Gande jhar	Herb	Saururaceae	Roots, young leaves	Fresh roots and young leaves crushed and make chutney	Appetizer, used to treat gastric troubles
48.	<i>Horsfieldia kingii</i> (Hook.f.) Warb.	Ramgua	Tree	Myristicaceae	Fruits	Matured fruits are eaten raw unripe fruits are used to make pickle	Taken against intestinal problems
49.	<i>Juglans regia</i> L.	Okhar	Tree	Juglandaceae	Fruits	Kernel of the fruit is consumed after breaking the hard shell	High source of vitamins and minerals. Beneficial in Cardiovascular diseases and asthma
50.	<i>Laportea bulbifera</i> (Siebold & Zucc.) Wedd.	Patle sisnu	Herb	Urticaceae	Inflorescence and young shoots	Cooked as curry and consumed	Effective in controlling high blood pressure
51.	<i>Litsea cubeba</i> (Lour.) Pers.	Siltimbur	Tree	Lauraceae	Seeds	Fresh or dried seeds crushed to	Appetizer. Useful in gastric trouble.

52.	<i>Machilus edulis</i> King ex Hook.f.	Pumsi	Tree	Lauraceae	Fruits	make chutney with tomato Ripe fruits are directly eaten	It controls blood sugar level
53.	<i>Mentha spicata</i> L.	Padina	Herb	Lamiaceae	Leaves	Fresh leaves crushed with salt, tomato and chilly to make chutney	Fresh leaves are chewed in toothache, gum bleeding etc. juice extract from aerial parts taken during indigestion, gastritis and urinary troubles
54.	<i>Momordica cochinchinensis</i> (Lour.) Spreng.	Ban karela	Climber	Cucurbitaceae	Fruits	Unripe fruits cooked as vegetable	Good source of carbohydrate and beneficial in Anaemia
55.	<i>Morus alba</i> L.	Kimbu	Tree	Moraceae	Fruits	Ripe fruits are directly eaten or used to make jam /jelly etc.	Fruits improves appetite, eaten in indigestion and dysentery
56.	<i>Musa sikkimensis</i> Kurz.	Bankera	Herb	Musaceae	Fruits, Inflorescence	Ripe fruits are edible and flower buds are used as vegetables and also boiled and make 'achar'	Good substitute of cultivated bananas, flower buds are good source of minerals and iron, taken to control diarrhea and also advised to take in anemia
57.	<i>Myrica esculenta</i> Buch.- Ham.ex D.Don	Kaphal	Tree	Myricaceae	Fruits	Ripen fruit is taken raw	Important source of natural antioxidants and good sources of spices (Rawat et al., 2011)
58.	<i>Nasturtium officinale</i> R. Brown	Simrayo	Herb	Brassicaceae	Aerial part	Cooked as vegetables or make soup	Taken to control high blood pressure, jaundice and bodyache
59.	<i>Nephrolepis cordifolia</i> (L) C. Presl.	Paniamala	Herb	Nephrolepidaceae	Tubers	Underground parts are consumed directly	Juice extract from tubers taken orally to treat indigestion, fever and cough and body pain
60.	<i>Oroxylum indicum</i> (L.) Kurz.	Totola	Tree	Bignoniaceae	Flowers	Fresh flowers are cooked as vegetable	Anti-diabetic and considered as memory enhancer
61.	<i>Oxalis corniculata</i> L.	Chariamilo	Herb	Oxalidaceae	Leaves	Fresh leaves are eaten directly	Appetizer, beneficial in dysentery
62.	<i>Perilla frutescens</i> (L.) Britton	Silam	Herb	Lamiaceae	Seeds	Roasted seeds grind with salt, chilly and tomato to make chutney, powdered seeds added while making traditional 'achar' from potato, cucumber, radish etc. whole seeds mixed with beaten rice (<i>Chiura</i>) and consumed	Mature seeds chewed to control cough
63.	<i>Phlogacanthus thyrsoformis</i> Nees	Titay	Shrub	Acanthaceae	Inflorescence	Cooked as vegetable. One of the important ingredients of traditional dish 'Bungchipa' of Rai community	Highly effective in asthma and bronchitis, controls blood sugar level and blood pressure
64.	<i>Phyllanthus emblica</i> L.	Amala	Tree	Phyllanthaceae	Fruits	Mature fruits are eaten, also used to make pickle	Fresh or dried fruits taken against piles, constipation, gastritis, common cold, enhance liver function
65.	<i>Physalis minima</i> L.	Phakphakey	Herb	Solanaceae	Fruits	Ripen fruits are used to make chutney	Appetizer
66.	<i>Polygonum molle</i> D. Don	Thotne	Herb	Polygonaceae	Young leaf and	Fresh tender stem peeled off and	Eaten as pickle and used as appetizer

					stem	directly consumed or used to make salad/chutney etc.	
67.	<i>Prunus cerasoides</i> Buch.-Ham. ex D. Don	Paiyun	Tree	Rosaceae	Fruits	Ripe fruits are eaten fresh	Good source of vitamin "C"
68.	<i>Rhododendron arboreum</i> Sm.	Lali guras	Tree	Ericaceae	Flowers	Petals are used to make traditional wine	Fresh or dried flower petals are cure to dysentery, diarrhoea, throat trouble etc.
69.	<i>Rhus chinensis</i> Mill.	Bhakimlo	Tree	Anacardiaceae	Fruits	Fruit are used to make pickles	Fruit decoction ' <i>Chuk</i> ' taken to cure diarrhoea, dysentery and stomach disorders
70.	<i>Rubus ellipticus</i> Sm.	Aiselu	Shrub	Rosaceae	Fruits, Root	Ripen fruit is eaten	Root paste used in bone fracture, fruits decoction is taken against dysentery
71.	<i>Rubus wardii</i> Merr.	Aiselu	Shrub	Rosaceae	Fruits	Matured fruits are eaten	Helps in digestion, fruits decoction is effective against dysentery
72.	<i>Smilax zeylanica</i> L.	Kukurdaine	Climber	Liliaceae	Young shoots	Used as vegetables	It helps to control blood sugar level, beneficial for diabetic patient
73.	<i>Solanum nigrum</i> L.	Jangali bihi	Herb	Solanaceae	Fruits	Used as vegetables and pickle/achar.	Fruits are useful in stomach problem, it controls high blood pressure
74.	<i>Spondias pinnata</i> (L.f.) Kurz	Amara	Tree	Anacardiaceae	Fruits	Matured fruits are eaten raw	Matured fruit is used against gastritis and useful against blood dysentery
75.	<i>Syzygium cumini</i> (L.) Skeels	Jamuna	Tree	Myrtaceae	Fruits	Ripen fruits are eaten raw	Usually used for diabetes problems
76.	<i>Tamarindus indica</i> L.	Titiri	Tree	Fabaceae	Fruits	Pickle	Appetizer, blood purifier
77.	<i>Tectaria gemmifera</i> (Fee) Alston	Kali ningro	Herb	Tectariaceae	Young frond	Used as vegetable	Appetizer. It controls diarrhoea, blood dysentery, stomach disorder etc.
78.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Barra	Tree	Combretaceae	Fruits	Fresh or dried fruits are eaten,	Used in sore throat and cough, Masticator
79.	<i>Terminalia chebula</i> Retz.	Harra	Tree	Combretaceae	Fruits	Fresh or dried fruits are eaten,	Used in sore throat and cough, Masticator
80.	<i>Tetradium fraxinifolium</i> (Hook.f.) T.G. Hartley	Khanakpa	Tree	Rutaceae	Fruits/ Seeds	It is used as pickle	Appetizer, dried fruit powder taken with water to treat dysentery, gastritis, food poisoning, cough and cold
81.	<i>Trichosanthes tricuspidata</i> Lour.	Indreni	Climber	Cucurbitaceae	Tender shoots, Seeds	Tender shoots are cooked as vegetables and roasted seeds are consumed or used to make pickle	Fruits used as carminative, seeds are good purgative (Bhandari et al., 2008)
82.	<i>Tupistra nutans</i> Wall. ex Lindl.	Nakima	Herb	Asparagaceae	Inflorescence	Curry and Pickle	Controls high blood pressure and blood sugar level
83.	<i>Urtica dioica</i> L.	Gharia sisnu	Herb	Urticaceae	Tender shoots, inflorescence	Cooked as vegetables	Controls high blood pressure
84.	<i>Viburnum erubescens</i> Wall.	Asare	Tree	Adoxaceae	Fruits	Fruit is eaten fresh	Appetizer
85.	<i>Ziziphus jujuba</i> Mill.	Bayer	Tree	Rhamnaceae	Fruits	Ripe fruits are eaten fresh and unripe fruits are used to make pickles	Good source of natural sugar, vitamins and minerals
86.	<i>Zanthoxylum acanthopodium</i> DC.	Boke timbur	Shrub	Rutaceae	Fruits	Fruits are used to make chutney	Appetizer, beneficial in gastric problems

Table 2. List of common wild edible plants sold at local markets of Kalimpong area.

S.No	Wild Edible Plants	Local Name	Market Price in Samthar (Rs.)	Market Price in Kalimpong (Rs.)	Available Season
1.	<i>Allium hookeri</i> (Leaves)	Dungdug	10/ bundle	15 – 20 / bundle	May-Jul.
2.	<i>Amaranthus spinosus</i> (Leaves)	Ban Lude	10-20/bundle	-	April-May
3.	<i>Amorphophallus paeoniifolius</i> (Young shoots)	Gurbo /Oal	10-15/ bundle	20 – 30 / bundle	Jun-Jul.
4.	<i>Baccaurea ramiflora</i> (Fruit)	Kusum	20-25 /kg	60 – 80 / kg	Jun-Jul.
5.	<i>Bauhinia variegata</i> (Flowers)	Koirala	10-15/bundle	20 – 30 / bundle	Mar.-Apr.
6.	<i>Calamus erectus</i> (Fruits)	Betgera	20- 30 / kg	60 – 80 / kg	Apr.-Jul.
7.	<i>Castanopsis hystrix</i> (Fruit nuts)	Patle katus	30-40/kg	60 – 80 / kg	Nov-Dec.
8.	<i>Castanopsis indica</i> (Fruit nuts)	Jat katus	30-40/kg	60 – 80 / kg	Nov-Dec.
9.	<i>Castanopsis tribuloides</i> (Fruit nuts)	Musure katus	30-40/kg	60 – 80 / kg	Dec-Jan.
10.	<i>Choerospondias axillaris</i> (Fruits)	Lapsi	30-40/kg	60 – 80 /kg	Sept- Dec.
11.	<i>Cinnamomum tamala</i> (Leaves)	Tejpatta	-	10-20 / packet	Throughout the year
12.	<i>Colocasia esculenta</i> (Tubers)	Pindalu	20-30 /kg	40 – 60 / kg	Feb.-May
13.	<i>Cyphomandra betacea</i> (Fruits)	Rukh tamatar	20-30/kg	50 – 60 /kg	May-Sept.
14.	<i>Dendrocalamus hamiltonii</i> (Young shoots)	Tama	30-40 (kg)	60 – 80 / kg	Jun-Jul.
15.	<i>Dioscorea alata</i> (Tubers)	Ghar tarul	20-30/ kg	50 – 100 / kg	Jan-Mar.
16.	<i>Dioscorea pentaphylla</i> (Tubers)	Bantarul	40 – 60 / kg	80-100 /kg	Jan-Mar.
17.	<i>Diplazium esculentum</i> (Young shoots)	Chiple ningro	10/ bundle	20 – 30 / bundle	May-Aug.
18.	<i>Diploknema butyracea</i> (Fruits)	Chewri	20-30/kg	60 – 80 /kg	May-Jul.
19.	<i>Dryopteris cochleata</i> (Young shoots)	Danthe ingro	10-15/bundle	20 – 30 / bundle	Jun-Aug.
20.	<i>Elaeagnus latifolia</i> (Fruits)	Musleri/Maldhe	20 – 30 / kg	40- 60 / kg	Feb.-Mar.
21.	<i>Eriolobus indica</i> (Fruits, fruit decoction- 'Chuk')	Mehel	Fruits-60-80/kg Decoction- 100/ bottle (200 ml)	Fruits- 100 -150/ kg Decoction- 200/ bottle (200 ml)	Nov.- Dec.
22.	<i>Eryngium foetidum</i> (Leaves)	Bhote dhania	5 /bundle	10 /bundle	May- Oct.
23.	<i>Evodia fraxinifolia</i> (Fruits)	Khanakpa	20-30/kg	60 – 80 / kg	Aug-Sept.
24.	<i>Ficus benjamina</i> (Leaf buds)	Kabra	15-20 /kg	60 – 80/ kg	Mar-Apr.
25.	<i>Girardinia diversifolia</i> (Inflorescence)	Bhangre sisnu	30 – 40 /kg	80 – 100 / kg	Sept-Nov.
26.	<i>Guizotia abyssinica</i> (Seeds)	Philunge	40-50/kg	100 – 150 / kg	Dec-Apr.
27.	<i>Juglans regia</i> (Fruits)	Okhar	1-2/piece	5-7 / piece	Sept-Dec.
28.	<i>Litsea cubeba</i> (Fruits)	Siltimbur	5-10 / bunch	15 – 20 / bunch	Jul.-Aug.
29.	<i>Machilus edulis</i> (Fruits)	Pumsi	40-50 /kg	80 – 100/ kg	Aug- Jan.
30.	<i>Mentha spicata</i> (Young leaf)	Padina	5/bundle	10 / bundle	Mar.-Sept.
31.	<i>Momordica cochinchinensis</i> (Fruits)	Bankarela	20-30/ kg	40 – 60 / kg	May-Jun.
32.	<i>Myrica esculenta</i> (Fruits)	Kaphal	30-40/kg	-	May-Jun.
33.	<i>Nasturtium officinale</i> (Leaves)	Simrayo	10/ bundle	20 – 30 /bundle	May-Oct.
34.	<i>Oroxylum indicum</i> (Flowers)	Totala	10-15/ ring of 15-20 flowers	20 – 30 / ring of 15-20 flowers	Jun-Jul.
35.	<i>Perilla frutescens</i> (Seeds)	Silam	40-50/kg	80 – 100/ kg	Dec-Apr.
36.	<i>Phlogacanthus thyriformis</i> (Inflorescence)	Titay	10-15 /bundle	20 – 30 /bundle	Feb-Apr.
37.	<i>Phyllanthus emblica</i> (Fruits)	Amala	20-30/kg	40 – 60 /kg	Nov-Jan.
38.	<i>Rhus chinensis</i> (Fruits, fruit decoction -' Chuk')	Bhakimlo	Fruits - 80 – 100/ kg Decoction – 100/ bottle (200 ml)	Fruits – 200-250/ kg Decoction – 200/bottle (200 m)	Nov.-Jan.
39.	<i>Solanum nigrum</i> (Fruits)	Jangali bihi	20-30/kg	-	Apr-Jul.
40.	<i>Terminalia bellirica</i> (Fruits)	Barra	30 -40/ kg	-	Oct.-Jan.
41.	<i>Terminalia chebula</i> (Fruits)	Harra	30 -40/ kg	100 – 120/ kg	Oct.-Jan.
42.	<i>Tectaria gemmifera</i> (Young fronds)	Kali ningro	10 – 15 / bundle	20 – 30 / bundle	Jun.-Jul.
43.	<i>Tupistra nutans</i> (Inflorescence)	Nakima	40-50/ kg	100- 150/ kg	Oct. –Feb.
44.	<i>Urtica dioica</i> (Tender shoots and inflorescence)	Gharia sisnu	Tender shoots 10/bundle Inflorescence- 50/ kg	Tender shoots 20 – 30/bundle Inflorescence- 100 -120/kg	Jun - Jul.
45.	<i>Zanthoxylum acanthopodium</i> (Fruits)	Boke timbur	30-40/ kg	80 – 100 /kg	Aug-Sept.
46.	<i>Ziziphus jujuba</i> (Fruits)	Bayer	30-40/kg	80 – 100 / kg	Feb-Apr.

Phyllanthus emblica, *Prunus cerasoides*, *Tupistra nutans*, etc.

But large scale cultivation of these wild edible plants are yet to be initiated, it should be encouraged to the farmers' field and adequate agro-technologies to be imparted like field promoting agro-forestry practices involving government and non-governmental organizations so that the treasure house of genetic resources will be conserved in their natural habitat reducing the risk of imbalance of the fragile mountain ecosystem, which will further provide improved nature based livelihood option to the communities involved. Above all, it will ensure safeguard to these genetic resources in their natural habitat, reducing the threat of species extinction due to overexploitation in the wild.

Furthermore, there is an urgent need to assess the nutraceutical potentials of each and every wild edible plant species in present context though such studies are carried out in limited number of plant species (Sundriyal & Sundriyal, 2001 & 2003; Pradhan, 2013; Singh *et al.*, 2014; Pradhan & Tamang, 2015). A thorough study on nutraceutical potential and proper screening of such resources will help many ways to solve different health related issues arising due to modern lifestyle changes within different communities.

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