

# International Journal of Applied Sciences and Biotechnology

A Rapid Publishing Journal

ISSN 2091-2609



**Available online at:**

<http://www.ijasbt.org>

&

<http://www.nepjol.info/index.php/IJASBT/index>

## **Indexing and Abstracting**

CrossRef, Google Scholar, Global Impact Factor, Genamics, Index Copernicus, Directory of Open Access Journals, WorldCat, Electronic Journals Library (EZB), Universitätsbibliothek Leipzig, Hamburg University, UTS (University of Technology, Sydney): Library, International Society of Universal Research in Sciences (EyeSource), Journal Seeker, WZB, Socolar, BioRes, Indian Science, Jadoun Science, Jour-Informatics, Journal Directory, JournalTOCs, Academic Journals Database, Journal Quality Evaluation Report, PDOAJ, Science Central, Journal Impact Factor, NewJour, Open Science Directory, Directory of Research Journals Indexing, Open Access Library, International Impact Factor Services, SciSeek, Cabell's Directories, Scientific Indexing Services, CiteFactor, UniSA Library, InfoBase Index, Infomine, Getinfo, Open Academic Journals Index, HINARI, etc.

**CODEN (Chemical Abstract Services, USA): IJASKD**

Vol-2(3) September, 2014



Impact factor\*: **1.422**

Scientific Journal Impact factor#: **3.419**

IC Value: **4.37**

\*Impact factor is issued by Universal Impact Factor. Kindly note that this is not the IF of Journal Citation Report (JCR).

#Impact factor is issued by SIIF INNO SPACE.

For any type of query and/or feedback don't hesitate to email us at: [editor.ijasbt@gmail.com](mailto:editor.ijasbt@gmail.com)



Research Article

WILD EDIBLE PLANTS USED BY ENDANGERED & INDIGENOUS RAJI TRIBE IN  
WESTERN NEPAL

Lal B Thapa<sup>1\*</sup>, Til Maya Dhakal<sup>2</sup> and Raghunath Chaudhary<sup>1</sup>

<sup>1</sup>Central Department of Botany, Tribhuvan University, Kirtipur, Kathmandu, Nepal

<sup>2</sup>Siddha Nath Science Campus, Tribhuvan University, Mahendra Nagar, Kanchanpur, Nepal

\*Corresponding author ([lal\\_thapa25@yahoo.com](mailto:lal_thapa25@yahoo.com))

**Abstract**

The Rajis are one of the endangered indigenous people distributed in western part of Nepal enriched in their own mother tongue, culture, beliefs and practices. Owing to lack of proper documentation, the traditional knowledge of uses and practices on wild edible plants by such an endangered community is about to extinct. This paper aims to present the traditional practices and use of wild edible plants by Raji people in Nepal. Our study found that a total of 67 wild edible plant species included in 56 genera and 38 families used by Raji people. Out of them 62 species were angiosperms, one species was Gymnosperm and 4 species were Pteridophytes. The results of study show that Rajis have their traditional way to use different parts of wild plants such as seeds, fruits, leaves, shoots, roots and tubers in the forms of vegetables, pickles, juice, and raw or as fruits.

**Keywords:** Indigenous; Raji; edible plants; focus group; transect walk

**Introduction**

Wild edible plants in Nepal are important sources of food supplements and have been utilized traditionally in local communities (Shrestha, 2001; Uprety et al., 2012). The indigenous communities have been abandoning their traditions and by this means they are losing their plant knowledge over time (Benz et al. 2000). Therefore the tradition of using wild food is at risk of disappearing throughout world (Bhattarai et al., 2009; Abbasi et al., 2013). The activities such as change in land use, deforestation, urbanization, and cultural transformations are important causes to change practice and traditional knowledge of utilization of wild food plants (Acharya and Acharya, 2010). There is always negative impact of loss of indigenous knowledge on biodiversity conservation (Keller et al., 2005) and therefore the urgent task necessary to carry out in the context of disappearing these practices is to document the traditional indigenous knowledge for preservation of genetic and cultural diversity (Shrestha and Dhillon, 2006; Tremote et al., 2011) as well as for the application of traditional knowledge

The Rajis are semi-nomadic group and one of the endangered indigenous people of Nepal found in mid-western and far western part of the country (Surkhet, Dang, Bardia, Kailali and Kanchanpur districts of Nepal). They have their own mother tongue, culture, beliefs and practices.

They are dependent on traditional means of survival like fishing, collecting forest products and hunting in the forest (Maskey, 2007).

There is risk of disappearing Raji's knowledge on wild plants with older generation due to ignorance of younger generations on traditional practices by adopting new and different lifestyle (Thapa, 2012). Hence, the documentation of indigenous knowledge of endangered tribes on wild plants is essential to preserve their use and practice for new findings and investigations with modern approach. This paper aims to reveal the traditional practice and use of wild food plants by endangered Raji ethnic community in Nepal.

**Study Area**

The Rajis are distributed mainly in three districts (Surkhet, Dang and Bardiya) of mid-western Nepal and two districts (Kailali and Kanchanpur) of Far Western Part of Nepal. According to Central Bureau of Statistics - CBS (2011), total population of Raji is 4235. The larger population is found in mid-western hill region (1279), mid-western Terai (827) and Far Western Terai (2033) (CBS, 2011). This study on traditional use of wild edible plants by this community was conducted in Surkhet and Kailali districts.

The Surkhet district is the original land of Rajis people. It is part of mid hill region lies between 28° 40' 26" N and 81° 35' 20" E and covers a total area of 2451 sq. km with population 72,863 (CBS, 2011). Three Village

Development Committees (VDCs) viz. Uttarganga, Chhinchu & Ghat Gaun inhabited by Rajis were selected for the study. The population of Rajis in Uttarganga VDC is 50, Chhinchu VDC (128) and Ghat Gaun VDC is 210 (Raji Salma Samaj, 2012).

Kailali district lies between 28°34'N and 80°34'E, is one of the most populated districts by Raji due to migration from their original land. It is part of tropical Tarai region having a hot climate generally prevails throughout the year except short winter which covers an area of 2742 square kilometers with population 1,42,480 (CBS, 2011). The study areas selected in Kailali were mainly the VDCs inhabited by Rajis viz. Chaumala and Khailad having population 238 and 811 respectively (Raji Salma Samaj, 2012).

## Methods

Field visits were made from September 2012 to March 2013 to obtain primary information regarding the uses, value, indigenous knowledge and practice towards utilization of wild edible plants. The key informants (knowledgeable men and women, plant collectors, household owners) were interviewed to get primary information of wild edible plants such as local name, parts used, method of use, and local status etc. A standard questionnaire was prepared for interview to meet the objectives of study and prior consent was obtained from the respondents before interviewing them. Total three focus group discussions were carried out during the study period in each VDC. Each focus group included 5-10 people including key informants and knowledgeable male and female Raji individuals. Transect walk survey and plants specimen collections were made with key informants and knowledgeable people. The walk survey was carried out in croplands, grass lands, forests & all possible locations.

The taxonomic characters of collected plant species with necessary information were noted down in the field. The plant specimens were also exhibited during focus group discussion and interviews. The voucher specimens were identified with the help of standard literatures (Polunin and Stainton, 1984; Manandhar, 2002; Press et al., 2000 & Joshi and Joshi, 2001)) and comparing with specimens at Tribhuvan University Central Herbarium (TUCH). All the herbaria are deposited at TUCH. The herbaria were not prepared for those plants identified in the field.

## Results and Discussion

### Taxonomic Diversity

A total of 67 species of 56 genera and 38 families have been recorded as wild edible plants used by Raji people. During the study, 52 species belonging to 29 families of dicotyledons, 10 species belonging to 5 families of Monocotyledon, one species of Gymnosperm and 4 species of Pteridophytes were recorded (Fig. 1). The largest family was Moraceae having 8 species followed by Asteraceae (4

species), Dioscoreaceae (4 species), Rosaceae (3 species) and Rutaceae (3 species) (Table 1).

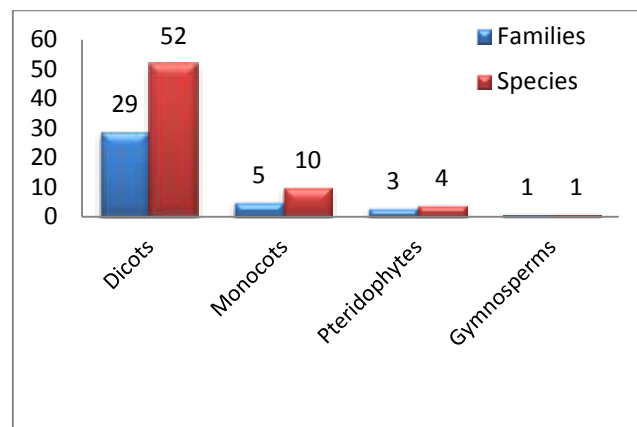


Fig.1: Number of edible plant species and family among different taxonomic groups used by Rajis

### Life form and habitat

Among recorded plant species, 30 edible species (44.77%) were trees followed by 16 species of herbs (23.88%), 12 species of shrubs (17.91%) and 9 species (13.43%) of climbers (Fig. 2). The plant habitat was categorized into forest, near crop field, crop field, and cultivated. Among the collected species the highest number of species were recorded from forest (41 species) followed by near crop field (15 species) such as road side; fallow land or open area, 5 species from crop field and 6 species were practiced in cultivation (Fig. 3). Present status of edible plants was also maintained according to the information of local Raji people and observation during the field study. They were categorized into common, frequent and rare. Most of the species were frequent (28 species), 25 species were categorized into common and 14 species were ranked as rare species (Fig. 4).

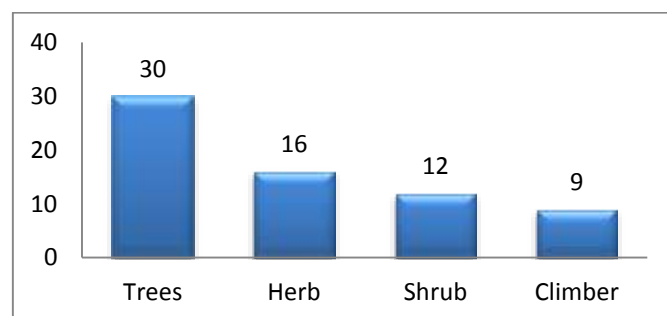


Fig. 2: Life forms of edible plants used by Rajis

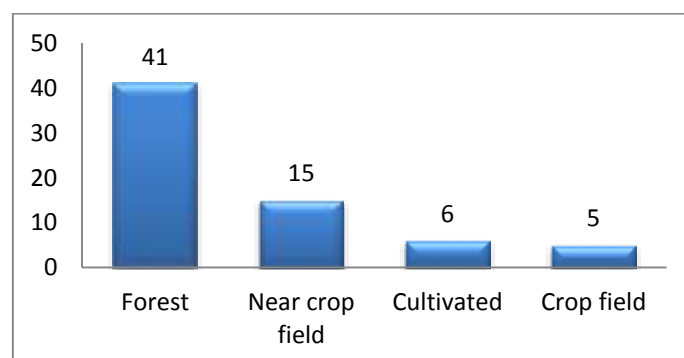


Fig 3: Habitat of edible plants used by Rajis

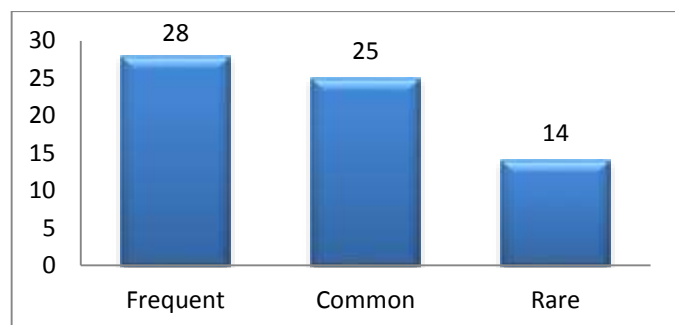


Fig. 4: Status of edible plants

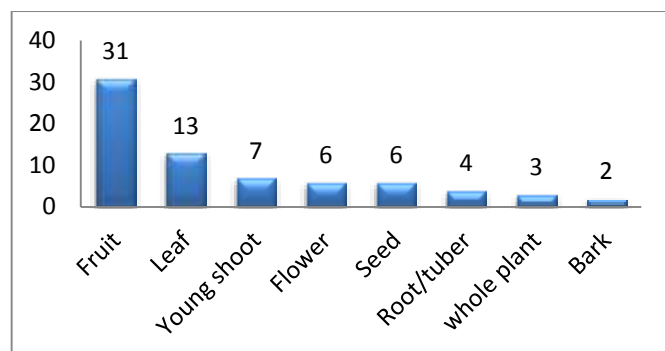


Fig 5: Edible plant parts used by Rajis

#### Plant parts & forms used

The most commonly used part of wild plants was fruit (31 species, 46.26%) followed by leaf (11 species, 19.40%), young shoot (7 species, 10.44%), flower and seed (6 species, 8.95%). (Fig. 5). Different forms of use of edible plants were as fruits (33 species, 49.25%) followed by vegetable (19 species, 28.35%). Other used forms were pickle, boiled form, juice, powder, spices and as tea (Fig. 6). The most common edible fruits were of *Berberis aristata* DC., *Rubus ellipticus* Sm., *Syzygium cumini* (L.) Skeels, *Myrica esculenta* Buch.-Ham ex D.Don, *Diploknema butyracea* (Roxb.) H.J.Lam, *Morus australis* Roxb etc. *Urtica dioica* L., *Chenopodium album* L., *Amaranthus spinosus* L., *Colocasia esculenta* (L.) Schott., *Diplazium esculentum* (Retz) Sw., *Dryopteris cochleata* (Ham. ex D. Don) C. Chr., *Pteris biaurita* L. and *Tectoria* species were the most common green vegetables. The root/tuber of *Dioscorea* (*D. deltoidea* Wall., and *D. alata* L.) were commonly used in boiled forms or as vegetables. It was found during the study that some pre-treatments are needed before use of some species. For example, *D. bulbifera* L. should be boiled with ash to remove its bitter taste and *D. kamoonsensis* Kunth. should be boiled and placed in water overnight before eating. The common species such as flowers of *Bauhinia variegata* L. and *Smilax ovalifolia* Roxb., the leaves of *Ficus lacor* Buch.-Ham and *Oxalis corniculata* L., fruits of *Phyllanthus embelica* L. and seeds of *Cannabis sativa* L. were found to be used as pickle.

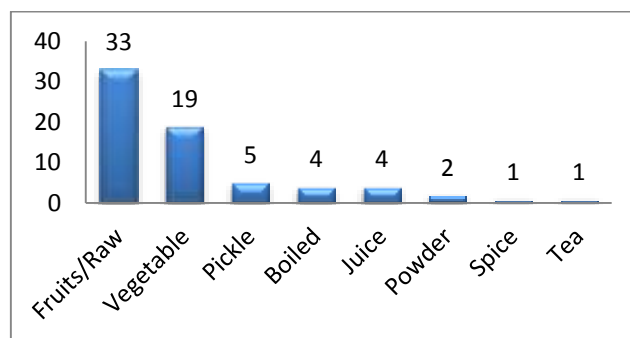


Fig 6: Edible forms of plants used by Rajis

Two species (*Elephantopus scaber* L. and *Inula cappa* DC.) were used as fermenting agents. The practice was to dry whole plant and make powder to prepare fermenting bread which can be used during fermentation to prepare alcohol traditionally. Some species were found edible because of their special character such as they add slippery nature in flour. The bark of *Bombax ceiba* L. and *Boehmeria regulosa* Wedd. was found to be used by mixing either in the form of powder or paste with flour to prepare bread (*Sel*) in special ceremony.

The study revealed that the seeds of *Bahunia vahlii* Wight & Arn are eaten both raw or boiled form and seeds of *Pinus roxburghii* Sarg. are eaten raw or roasted form. Flower of *Rhododendron arboreum* Roxb. can be eaten raw but it should be consumed in less quantity at a time because it may cause vomiting or other effect whereas the nectary juice is sucked from flowers of *Woodfordia fruticosa* (L.) Kurz and *Justica adhatoda* L.

The indigenous knowledge existed in communities is now going to be at risk of loss due to the activities such as deforestation; urbanization; population pressure; habitat destruction (Acharya and Acharya, 2009); modern facilities and practices of cultivating hybrid fruits and vegetables. Number of ethnobotanical works on different ethnic groups of Nepal have been carried out by various researchers such as in Chepang and Tamang by Manandhar (1991); Daniggelis (1994); Tharu and Darai tribe by Dangol and Gurung (1991, 2000); Gurung cast by Shrestha (1998); Rai and Sherpa castes by Bhattarai (1991); Mooshar by Manandhar (1986), Satar tribe by Siwakoti and Siwakoti (2000) and Limbu community by Siwakoti and Siwakoti (1998). These studies focused mainly medicinal plants used by indigenous communities of Nepal but studies on wild edible plants are very limited. This study was the first attempt to document the traditional use and practice on wild edible plants by endangered Raji community in Nepal. The validation of indigenous knowledge system through scientific experimentations will be an important area of future research and development.

**Table 1:** Wild Edible Plants used by Raji people

S.N.	Botanical Names/family	Nepali & Raji Name	Habit	Habitat	Status	Parts Used	Forms Used	Traditional use
1	<i>Acacia catechu</i> (L.f.) Willd. Fabaceae	Khayer (N) Khaia (R)	T	Forest	F	Wood	Tea	Small pieces of wood are placed in hot water for making tea.
2	<i>Justicia adhatoda</i> L. Acanthaceae	Asuro (N) Asur (R)	S	Open area	C	Flower	Flower juice	Juice of flower is sucked
3	<i>Aegle marmelos</i> (L.) Corr. Rutaceae	Bel (N) Belang, Bela (R)	T	Forest	R	Fruit	Fruit	Inner content of ripen fruit is eaten
4	<i>Amaranthus spinosus</i> L. Amaranthaceae	Lude (N) Mate (R)	H	Near crop field	C	Young shoot & Leaf	Vegetable	Leaves and young shoots are boiled or cooked as vegetable
5	<i>Ardisia solanacea</i> Roxb. Myrsinaceae	Damaifal (N) Kholikafal (R)	S	Near crop field	F	Fruit	Fruit	Ripen fruits are eaten raw
6	<i>Artocarpus lakoocha</i> Wall. ex Roxb Moraceae	Badhar (N) Badhar (R)	T	Forest	R	Fruit	Fruit	Ripen fruits are eaten raw
7	<i>Bahunia vahlii</i> Wight & Arn Fabaceae	Malu (N) Mee, Mrak (R)	Cl	Forest	F	Seed	Raw or boiled seed	The seeds are taken out from mature fruit and eaten raw or boiled or burned before eating.
8	<i>Bauhinia variegata</i> L. Fabaceae	Koiralo (N) Greainblack (R)	T	Forest	C	Flower	Pickle	Flowers are plucked, boiled and dried to prepare delicious pickle
9	<i>Berberis aristata</i> DC. Berberidiaceae	Chutro (N) Trikhula (R)	S	Open area	F	Fruit	Fruit	Ripen fruits are eaten raw
10	<i>Boehmeria regulosa</i> Wedd. Urticaceae	Githi (N) Genthi (R)	T	Forest	R	Bark	Mixed with bread	Bark is crushed and added in flour before preparing special bread (SEL)
11	<i>Bombax ceiba</i> L. Bombacaceae	Simal (N) Syamling (R)	T	Open area	R	Bark, Flower	Mixed with bread	Bark is crushed and added in flour before preparing special bread (SEL)
12	<i>Bridelia retusa</i> (L.) Spreng. Euphorbiaceae	Gayo (N) Gayo (R)	T	Forest	C	Fruit	Fruit	Ripen fruits are eaten raw
13	<i>Callicarpa macrophylla</i> Vahl. Verbenaceae	Guyelo (N) Guyali (R)	T	Forest	R	Fruit	Fruit	Ripen fruits are eaten raw
14	<i>Cannabis sativa</i> L. Cannabaceae	Bhang (N) Bhanga (R)	S	Near crop field	C	Seed	Pickle	Mature seeds are roasted and crushed with mixing spices to prepare pickle
15	<i>Cassia fistula</i> L. Fabaceae	Rajbrikshya (N) Banar Lauri (R)	T	Forest	F	Young Fruit	Vegetable	Young fruits are boiled and used as vegetable
16	<i>Chenopodium album</i> Chenopodiaceae	Bethe (N) Bethuwa (R)	H	Crop field	C	Young shoot & Leaf	Vegetable	Leaves and young shoots are boiled and cooked as vegetable

(T = tree, S = shrub, H = herb, Cl = climber, F = frequent, C = common, R = rare, N = Nepali name, R = Raji name)



S.N.	Botanical Names/family	Nepali & Raji Name	Habit	Habitat	Status	Parts Used	Forms Used	Traditional use
17	<i>Cleistocalyx operculata</i> (Roxb.) Merr. & Perry Myrtaceae	Kyamuna (N) Bhukijabu (R)	T	Forest	R	Fruit	Fruit	Ripen fruits are eaten raw
18	<i>Coccinia grandis</i> (L.) Viogct. Cucurbitaceae	Golkankri (N) Golkankri (N)	Cl	Forest	C	Fruit	Fruit	Ripen fruits are eaten raw
19	<i>Commelina benghalensis</i> L. Commelinaceae	Kane Jhar (N) Kane (R)	H	Crop field	C	Young shoot & Leaf	Vegetable	Young leaves are cooked as vegetable
20	<i>Diploknema butyracea</i> (Roxb.) H.J.Lam Sapotaceae	Chiuri (N) Chiure (R)	T	Forest	F	Fruit	Fruit	Ripen fruits are eaten raw
21	<i>Duchesnea indica</i> (Andr.) Focke Rosaceae	Bhui Kafal (N) Bhusyai Kafala (R)	H	Near crop field	C	Fruit	Fruit	Ripen fruits are eaten raw
22	<i>Elephantopus scaber</i> L. Asteraceae	Sahasra Buti (N) Jad Dabai (R)	H	Forest	C	Whole plant	Fermenting Agent	Plants are dried and its powder is used as fermenting agent
23	<i>Ficus auriculata</i> Lour. Moraceae	Timila (N) Timli (R)	T	Near crop field	R	Fruit	Fruit	Ripen fruits are edible
24	<i>Ficus benghalensis</i> L. Moraceae	Bar (N) Barnang (R)	T	Cultivated	R	Fruit	Fruit	Ripen fruits are edible
25	<i>Ficus hispida</i> L.f. Moraceae	Tote (N) Khasreti (R)	T	Near crop field	R	Fruit	Fruit	Ripen fruits are edible
26	<i>Ficus lacor</i> Buch.-Ham Moraceae	Kapro (N) Kavra (R)	T	Forest	R	Young leaf	Pickle	Young leaves are boiled and mixed with spices to make pickle
27	<i>Ficus recemosa</i> L. Moraceae	Dumri (N) Uvring (R)	T	Near crop field	R	Fruit	Fruit	Ripen fruits are eaten raw
28	<i>Ficus semicordata</i> Buch. Ham ex Sm Moraceae	Khanim (N) Khon (R)	T	Forest	F	Fruit	Fruit	Ripen fruits are eaten
29	<i>Inula cappa</i> DC. Asteraceae	Gai Tiware (N) Gai Tiware (R)	S	Forest	C	Whole plant	Fermenting Agent	Plant is dried and its powder is used as fermenting agent
30	<i>Martynia annua</i> L. Pedaliaceae	Baghjuge (N) --	S	Open area	F	Fruit	Fruit	Bark is removed from mature fruits and chewed. The embryo is delicious
31	<i>Morus australis</i> Roxb. Moraceae	Kimbu (N) Toont (R)	T	Cultivated	F	Fruit	Fruit	Ripen fruits are edible
32	<i>Murraya koenigii</i> (L.) Spreng Rutaceae	Asare (N) Bokraitee (R)	S	Open area	C	Fruit	Fruit	Ripen fruits are delicious and eaten raw

(T = tree, S = shrub, H = herb, Cl = climber, F = frequent, C = common, R = rare, N = Nepali name, R = Raji name)

S.N.	Botanical Names/family	Nepali & Raji Name	Habit	Habitat	Status	Parts Used	Forms Used	Traditional use
33	<i>Myrica esculenta</i> Buch.-Ham ex D.Don Myricaceae	Kafal (N) Kafal (R)	T	Forest	F	Fruit	Fruit	Fruits are valuable and delicious
34	<i>Nicandra physaloides</i> (L.) Gaertn. Solanaceae	Isamgol (N)	H	Near crop field	F	Fruit	Fruit	Fruits are edible
35	<i>Ocimum sanctum</i> L. Lamiaceae	Tulsi (N) Tulsi (R)	H	Cultivated	F	Leaf	Juice/Tea	Juice of leaves and young shoots are taken for medicinal purpose and leaves are mixed in tea.
36	<i>Oxalis corniculata</i> L. Oxalidaceae	Chariamilo (N) Gansing (R)	H	Near crop field	C	Leaf	Pickle, Mixed with vegetable	Leaves are boiled and used to prepare pickle or mixed with vegetables
37	<i>Phyllanthus embelica</i> L. Euphorbiaceae	Amala (N) Ringa (R)	T	Forest	F	Fruit	Fruit	Fruits are eaten raw or boiled to make fermented pickle
38	<i>Rhododendron arboreum</i> Roxb. Ericaceae	Gunras (N) Gurans	T	Forest	F	Flower	Juice	Flower juice can be taken as juice
39	<i>Rubus ellipticus</i> Sm. Rosaceae	Aiselu (N) Aisyalu (R)	S	Open area	F	Fruit	Fruit	Ripen fruits are delicious and edible
40	<i>Rubus rugosus</i> Rosaceae	Bhaise aiselu (N/R)	Cl	Forest	F	Fruit	Fruit	Fruits are edible
41	<i>Schleichera trijuga</i> Willd Sapindaceae	Kusum (N) Koshban (R)	T	Forest	F	Fruit	Fruit	Ripe fruits are eaten raw and also used in pickle
42	<i>Semecarpus anacardium</i> L. f. Anacardiaceae	Valayo (N) Ryak (R)	T	Forest	F	Seed	Fruit	Fruits are edible. Higher dose may cause negative effects.
43	<i>Solanum nigrum</i> L. Solanaceae	Kamain (N) Koiyan (R)	H	Crop field	C	Fruit	Fruit	Ripen fruits are eaten raw
44	<i>Sonchus oleraceus</i> L. Asteraceae	Dudhe Kada (N) Dudhi (R)	H	Crop field	C	Young shoot & Leaf	Vegetable	Young leaves or shoots are sometimes used as vegetables
45	<i>Syzygium cumini</i> (L.) Skeels Myrtaceae	Jamun (N) Jamuna (R)	T	Forest	C	Fruit	Fruit	Ripe fruits are delicious and eaten raw
46	<i>Terminalia bellirica</i> (Gaertn.) Roxb. Combretaceae	Barro (N) Barain (R)	T	Forest	F	Fruit & Seed	Fruit	Fruits are chewed for medicinal purpose
47	<i>Terminalia chebula</i> Retz Combretaceae	Harro (N) Harain (R)	T	Forest	F	Fruit & Seed	Fruit	Fruits are chewed for medicinal purpose

(T = tree, S = shrub, H = herb, Cl = climber, F = frequent, C = common, R = rare, N = Nepali name, R = Raji name)

S.N.	Botanical Names/family	Nepali & Raji Name	Habit	Habitat	Status	Parts Used	Forms Used	Traditional use
48	<i>Urtica dioica</i> L. Urticaceae	Sisnu (N) Sisni (R)	S	Open area	F	Young shoot, Leaf	Vegetable	Young shoots and leaves are cooked as vegetable
49	<i>Vicia angustifolia</i> L. Fabaceae	Kutlkosa (N)	Cl	Crop field	C	Fruit	Fruit	Fruits are eaten raw or cooked as vegetable
50	<i>Woodfordia fruticosa</i> (L.) Kurz Lythraceae	Dhairo (N) Dhairee (R)	T	Open area	C	Flower	Juice	Juice is sucked from flowers
51	<i>Zanthoxylum armatum</i> DC. Rutaceae	Timur (N) Timru (R)	T	Cultivated	R	Fruit	Spices	Fruit is used as spices in pickle and vegetables
52	<i>Zizyphus mauritiana</i> Lam. Rhamnaceae	Bayer (N) Kolan (R)	T	Near crop field	F	Fruit	Fruit	Fruits are delicious and edible
<b>Monocot</b>								
53	<i>Aresima erubescens</i> (Wall.) Schott Araceae	ChariBanko (N) Jhyapuli (R)	H	Forest	C	Whole plant	Vegetable	Young shoot is collected, boiled, dried and cooked as vegetable
54	<i>Asparagus racemosus</i> Willd. Liliaceae	Kurilo (N) Kurila (R)	S	Forest	R	Young Shoot	Vegetable	Tuber and young shoot are cooked as vegetable
55	<i>Colocasia esculenta</i> (L.) Schott. Araceae	Gaba (N) Fexa (R)	H	Open area	C	Leaf	Vegetable	Leaves are cooked as vegetable
56	<i>Dendrocalamus hamiltonii</i> Nees & Arn. Ex Munro Poaceae	Bans (N) Pa (R)	S	Cultivated	F	Young shoot	Vegetable Pickle	Young shoots are called TAMA and cooked as vegetable and allowed to ferment to make pickle
57	<i>Dioscorea alata</i> L. Dioscoreaceae	Tarul (N) Koin (R)	Cl	Forest	F	Tuber, Bulbil	Boiled, Vegetable	Boiled root is eaten or cooked as vegetable
58	<i>Dioscorea kamoonsensis</i> Kunth. Dioscoreaceae	Tyaguna (N) Tyaguna (R)	Cl	Cultivated	R	Tuber, Bulbil	Boiled, Vegetable	Root is boiled, and cooked as vegetable
59	<i>Dioscorea bulbifera</i> L. Dioscoreaceae	Githa (N) Syak (R)	Cl	Forest	C	Tuber, Bulbil	Boiled	Tuber is cut into small thin pieces, boiled and eaten
60	<i>Dioscorea deltoidea</i> Wall. Dioscoreaceae	Vyakur (N) Bloin (R)	Cl	Near crop field	F	Tuber, Bulbil	Boiled, Vegetable	Root is boiled and eaten or cooked as vegetable
61	<i>Phoenix acaulis</i> Roxb. ex Buch.-Ham Arecaceae	Khajuri (N) Khajuri (R)	S	Forest	C	Stem, Fruit	Vegetable Fruit	Fruits are delicious to eat and young stem is cooked as vegetable
62	<i>Smilax ovalifolia</i> Roxb. Liliaceae	Kukurdaino (N) Ralbu (R)	Cl	Forest	F	Flower	Pickle	Young leaves or shoots are used to prepare pickle

(T = tree, S = shrub, H = herb, Cl = climber, F = frequent, C = common, R = rare, N = Nepali name, R = Raji name)



S.N.	Botanical Names/family	Nepali & Raji Name	Habit	Habitat	Status	Parts Used	Forms Used	Traditional use
<b>Gymnosperms</b>								
63	<i>Pinus roxburghii</i> Sarg. Pinaceae	Sallo (N) Sallu (R)	T	Forest	C	Seed	Raw or roasted Seed	Seeds are eaten raw or roasted form
<b>Pteridophytes</b>								
64	<i>Diplazium esculentum</i> (Retz) Sw. Athyraceae	Neuro (N) Zadha (R)	H	Shady area	C	Young leaf	Vegetable	Young leaf is used as vegetable
65	<i>Dryopteris cochleata</i> (Ham. ex D. Don) C. Chr. Drypteridaceae	Unyau (N) Kochyan (R)	H	Shady area	C	Young leaf	Vegetable	Young leaf is used as vegetable
66	<i>Pteris biaurita</i> L. Pteridaceae	Kuthurke (N/R)	H	Shady area	F	Young leaf	Vegetable	Young leaf is used as vegetable
67	<i>Tectaria sp</i> Pteridaceae	Kuthurke (N/R)	H	Shady area	F	Young leaf	Vegetable	Young leaf is used as vegetable

(T = tree, S = shrub, H = herb, Cl = climber, F = frequent, C = common, R = rare, N = Nepali name, R = Raji name)

As the Raji people are one of the endangered indigenous people of Nepal, the documentation of the knowledge and practice on use of wild edible plants is essential. The traditional knowledge and practice are decreasing by the level of age among Raji people. The elder people of the community have been still adopting traditional means of use and application of plant resources but ignorance of young generation symbols danger of extinction of such practices (Thapa et al., 2012). Therefore, there is not only essential to conserve or document such a wealth of information hidden among the Raji people but also to apply them to modern knowledge of science and technology

## Conclusion

It is evident from the study that endangered Raji ethnic tribe of Nepal consumed considerable amount of wild plants and they have their own traditional practices of using wild plants as food. The practice of consuming wild plants is at risk of vanishing due to change in feeding habit and life style. Therefore the emphasis should be given for documentation of traditional knowledge before lost and further research should be conducted on nutritional quality and domestication of such wild plants.

## Acknowledgement

We would like to acknowledge University Grant Commission, Bhaktapur, Nepal for providing financial support for this research. We are indebted to Raji people of Surkhet and Kailali district as well as Raji Salma Samaj, Tikapur, Kailali, Nepal for their every support and information. We are grateful to Prof. Dr. Mohan Siwakoti, Central Department of Botany for taxonomic identification of plants.

## References

- Abbasi AM, Khan MA, Shah MH, Pervez MM & Ahmad M (2013) Ethnobotanical appraisal and cultural values of medicinally important wild edible vegetables of Lesser Himalayas-Pakistan. *Journal of Ethnobiology and Ethnomedicine* **9**: 66 DOI: 10.1186/1746-4269-9-66
- Acharya R and Acharya KP (2009) Ethnobotanical study of Medicinal Plants Used by Tharu Community of Parroha VDC, Rupandehi District, Nepal. *Scientific World* **9**: 81-85.
- Acharya R and Acharya KP (2010) Eating from the wild: indigenous knowledge on wild edible plants in Parroha VDC of Rupandehi district, Central Nepal. *International Journal of Social Forestry (IJSF)* **3**(1): 28-48.
- Benz B, Cevallos J, Santana F, Rosales J and Graf S 2000 Losing knowledge about plant use in the Sierra De Manantlan biosphere reserve. *Mexico. Economic Botany* **54**: 183-191. DOI: 10.1007/BF02907821
- Bhattarai NK (1991) Folk herbal medicines of Makawanpur district, Nepal. *Int. Journal Pharmacognosy* **29** (4): 284-295. DOI: 10.3109/13880209109082899
- Bhattarai S, Chaudhary RP and Taylor RSL (2009) Wild edible plants used by the people of Manang district, Central Nepal. *Ecology of Food and Nutrition* **48** (1): 1-20. DOI: 10.1080/03670240802034996
- CBS (2011) *National Population and Housing Census, 2011 (National Report), Vol. 1, NPHC 2011*. Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics, Kathmandu, Nepal
- Dangol DR and Gurung SB (1991) Ethnobotany of the Tharu tribe of Chitwan district, Nepal. *Int. J. Pharmacognosy* **29**(3): 203-209. DOI: 10.3109/13880209109082879
- Dangol DR and Gurung SB (2000) Ethnobotanical Study of Darai in Chitawan District, Nepal. In: *Proceedings of Third National Conference on Science and Technology*. Kathmandu, Nepal. PP 1194-1213
- Daniggelis E (1994) Jungal resource use, adaptive strategies of Rais and Sherpas in the upper Arun valley of Eastern Nepal. In: M. Allen (Eds.), *Athropology of Nepal, people, problem and process*. Mandala Book Point, Kathmandu, Nepal.
- Joshi KK and Joshi SD (2001) *Genetic heritage of medicinal and aromatic plants of Nepal Himalay*. Buddha Academic Publishers and Distribution Pvt. Ltd. Kathmandu, Nepal
- Keller GB, Mndiga H and Maass BL (2005) Diversity and genetic erosion of traditional vegetables in Tanzania from the farmer's point of view. *Plant Genetic Resources: Characterization and Utilization* **3**(3): 400-413. DOI: 10.1079/PGR200594
- Manandhar NP (1986) A contribution to the ethnobotany of Mooshar Tribes of Dhanusha district, Nepal. *Journal of Natural History Museum* **10** (1-4): 53-64
- Manandhar NP (1991) Medicinal plant lore of Tamang tribe of Kabhrepalanchwok district, Nepal. *Economic Botany* **45** (1): 58-71. DOI: 10.1007/BF02860050
- Manandhar NP (2002) *Plants and people of Nepal*. Timber Press, Inc. Portland, Oregon, U.S.A.
- Maskey S (2007) *Indigenous knowledge system as resource for sustaining Raji Work and Life, A case study of Surkhet district*. Social Inclusion Research Fund Secretariat, SNV Netherlands Development Organization, Kathmandu, Nepal.
- Polunin O and Stainton A (1984) *Flowers of Himalaya*. Oxford, Oxford University Press.
- Press JR, Shrestha KK and Sutton DA (2000) *Annotated checklist of the flowering plants of Nepal*. The Natural History Museum, London and Tribhuvan University, Kathmandu, Nepal. 430 p
- Raji Salma Samaj (2012) *Record of Raji Population*. Raji Salma Samaj, Tikapur, Kailali, Nepal
- Shrestha I (1998) Ethnomedicobotanical studies of Gurung communities in Bichaur Village, Lamjung, Nepal. Report, International Centre for Integrated Mountain Development, Kathmandu, Nepal. p: 70

- Shrestha PM and Dhillon SS (2006) Diversity and traditional knowledge concerning wild food species in a locally managed forest in Nepal. *Agroforest Systems* **66**: 55-63. DOI: 10.1007/s10457-005-6642-4
- Shrestha SR (2001) The state of uncultivated foods in Nepal biodiversity and uncultivated food plants. In: Johnston, MM (Eds.), *Proceedings of the regional workshop on uncultivated foods and biodiversity*, Kathmandu, Nepal, 24-26, September, 2001, 33-39.
- Siwakoti M and Siwakoti S (2000) Ethnomedicinal uses of plants among the Satar tribe of Nepal. In: Maheswari, J.K. (Eds.), *Ethnobotany and Medicinal Plants of Indian Subcontinent*. Scientific publisher, pp 98-108.
- Siwakoti M and Siwakoti S (1998) Ethnomedicinal uses of plants among the Limbu of Morang District, Nepal. *Ecoprint* **5**(1): 79-84.
- Thapa LB (2013) Indigenous knowledge on common medicinal plants among Raji Community of Surkhet district, mid western Nepal. *Nepalese Journal of Biosciences* **2**: 88-92.
- Tremote C, Damme PV and Djailo BD (2011) Eating from the wild: Turumbu, Mbole and Bali traditional knowledge on non cultivated edible plants, District Tshopo, DR Congo. *Genetic Resource and Crop Evolution* **58**: 585-618. DOI: 10.1007/s10722-010-9602-4
- Uprety Y, Poudel RC, Shrestha KK, Rajbhandary S, Tiwari NN, Shrestha UB and Asselin H (2012) Diversity of use and local knowledge of wild edible plant resources in Nepal. *Journal of Ethnobiology and Ethnomedicine* **8**: 16. DOI: 10.1186/1746-4269-8-16