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Research Article

SURVEY OF SOME MEDICINALLY IMPORTANT LEAFY VEGETABLES IN RUPANDEHI DISTRICT OF WESTERN NEPAL

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Abstract

Green leafy vegetable is a major source of vitamins and micronutrients for people using only vegetarian diets rich in carbohydrates. In remote rural settlements where vegetable cultivation is not practiced and market supplies are, not organized, local inhabitants depend on indigenous vegetables, both cultivated in agricultural fields or kitchen gardens and wild for enriching the diversity of food. Knowledge of such food is part of traditional knowledge, which is largely transmitted through participation of individuals of households. The purpose of this study was to documentation of plants used as vegetables by the people of Rupandehi district of Lumbini zone of western Nepal. This paper revealed total 51 plant species belong to 45 genera under 32 Families of vascular plants. Out of 32 families, 24 families belong to dicot, 4 families to monocot and 4 families belong to ferns.

Key words: Green leafy vegetable; Rupandehi; Lumbini zone; Terai

Introduction

Leafy vegetable also called greens, vegetable greens; a leafy green or salad green are plant leaves eaten as vegetable, sometime accompanies by tender petioles and shoots. Leafy vegetables often come from short-lived herbaceous plant such as *Amaranth*s and *Spinach*. Woody plants whose leaves can be eaten as vegetable includes *Bauhinia*, *Ficus*, *Moringa* and so on hold an important place in well-balanced diets.

Leafy vegetables are mainly consumed for their nutritional values without much consideration for their medicinal importance. There are several varieties of these leafy vegetables either in the wild state or under cultivation in rural areas. Many thousands of wild species of plant provide important sources of protein, fats, vitamins, and minerals. This is especially true for both the poorest and the riches socio-economic groups of the people (Akhtar 2001; ICIMOD 2010; Aryal 2010).

Nepal is situated on the southern slopes of central Himalayas and occupies a total area 147,181 km² and its great biodiversity is associated with the exceptional diversity of topography, climate and agroecological conditions. In Nepal, between 5800 (Hara and Williams 1979, Hara *et al.*, 1978, 1982) and 6500 species of flowering plants (WCMC 1994) have been estimated, about 1500, of which are considered useful (Manandhar, 2002). Out of these, 651 species are economically useful including 440 species of wild food plants. About 200 plant species

were consumed as vegetables (Manandhar, 2002). Most of them however, are regarded underutilized or neglected.

There is no culture on the earth that has made use of plants for their physical, emotional and spiritual needs of the human life. Plants form an integral part of any society, any time. Use of plants as food, clothes, fodder, medicine, timber etc. by man is since time immemorial. In remote rural societies where vegetable cultivation is not practiced and market is not available for local inhabitants, they should be dependent on locally available plants those can used as vegetables. Ethnic people from various tribes have been started domesticating wild edible and useful plants by trial and error method. That was the base of modern agricultural practices and related research (Prescott & Prescott, 1990, Scherrer *et al.*, 2005 and Bussmann *et al.*, 2006).

Consumption of green vegetables is a chief source of vitamins and micronutrients for those who are vegetarian. Knowledge of these edible plants is part of their traditional knowledge, which is usually transmitted by elders to younger and by participation of individuals in collection of vegetable plants. Now a days, human vegetable consumption is based on rather very limited number of crops, but in many parts of the world the use of wild plants is very common (Bussmann & Sharon, 2006; Kunwar *et al.*, 2006; Cavender, 2006 and Pieroni *et al.*, 2007)

Cultivating and gathering indigenous vegetables for both self-consumption and sale are still very common in Nepal, particularly in remote areas. Increased use of traditional

vegetables can contribute to enhance people's health and standard of living as well as the economic and social status of the food producers themselves. During food scarcity periods, people from urban and rural communities heavily depend on gathering these vegetables from their natural habitats (Manandhar, 1982). Besides gathering vegetables from the wild, their cultivation in home-gardens plays an important role towards household food and nutritional security.

Vegetables are the edible plants or plant parts such as roots, rhizomes, tubers, bulbs, stems, leaves, flowers or non sweet fruits; eaten with the main course of meal either as salted-spiced-cooked recipe or as dessert and salads. They impart variety of flavor and test to the diet, making it more appetizing and relishing. Now a day, vegetables constitute an important part of the daily diet of millions of people all over the globe than ever before (Pandey 2008). The Terai is a flat and valuable agricultural land in the southern Nepal. It lies at an altitude of 60–300m between the Indian border and outer foothills of Siwaliks and Churia, where over 48% of Nepal population live (CBS 2011). The region is heavily traversed by the major river systems of the country. The soil of the region is a part of alluvial-Gangetic plains including the Bhabar region and the alluvial fans of the Siwaliks. It exhibits the tropical type of climate. The temperature of the study area ranges in between 12°C- 42°C during the coldest month (December-January) and the hottest month (June–July).The annual precipitation ranges from 1,000 to 2,500

mm. The history on the utilization of the plant resources in Nepal dates back to the work of Banerji (1955). In this study, he documented the various food and medicinal plants of eastern Nepal. After his work, some workers continued the ethnobotanical study in the 60's and 70's (Dobremez, 1976; Pandey, 1964). The reports on uses of plants by different Nepalese ethnic groups have been recorded only onwards 80's (Coburn, 1984; Bhattarai, 1989, 1990, 1991, 1992, 1993; Joshi and Edington, 1990; Manandhar 1989, 1990, 1992, 1993a,b, 1994, 1995, 1998, 1999; Mueller-Boeker, 1993; Pohle, 1990; Shrestha, 1985; Shrestha and Pradhan, 1986, Panthi and Chaudhary 2003, Joshi 2008; Bhattarai *et al.*, 2009; Singh *et al.*, 2011 & 2012a and b). These reports documented the information of uses of plant resources.

Study Area

Rupandehi district is situated in the Western Development Region of Nepal between 27° 20'00" to 27° 47'25" N latitude and 83°12'16" to 83°38'7" E longitude with an area of 1360 km² (CBS, 2011). The average temperature ranges in between 12° C to 42° C and average annual rainfall is 1391mm. It is surrounded by Nawalparasi district from east, Kapilvastu district from west, hilly districts of Palpa and Arghakhanchi from north and Mahrajganj district of Uttar Pradesh (India) from south. The east, west and north sides of the district have high potentiality of plants of ethnobotanical importance like plants used as vegetable and cure of different disease.

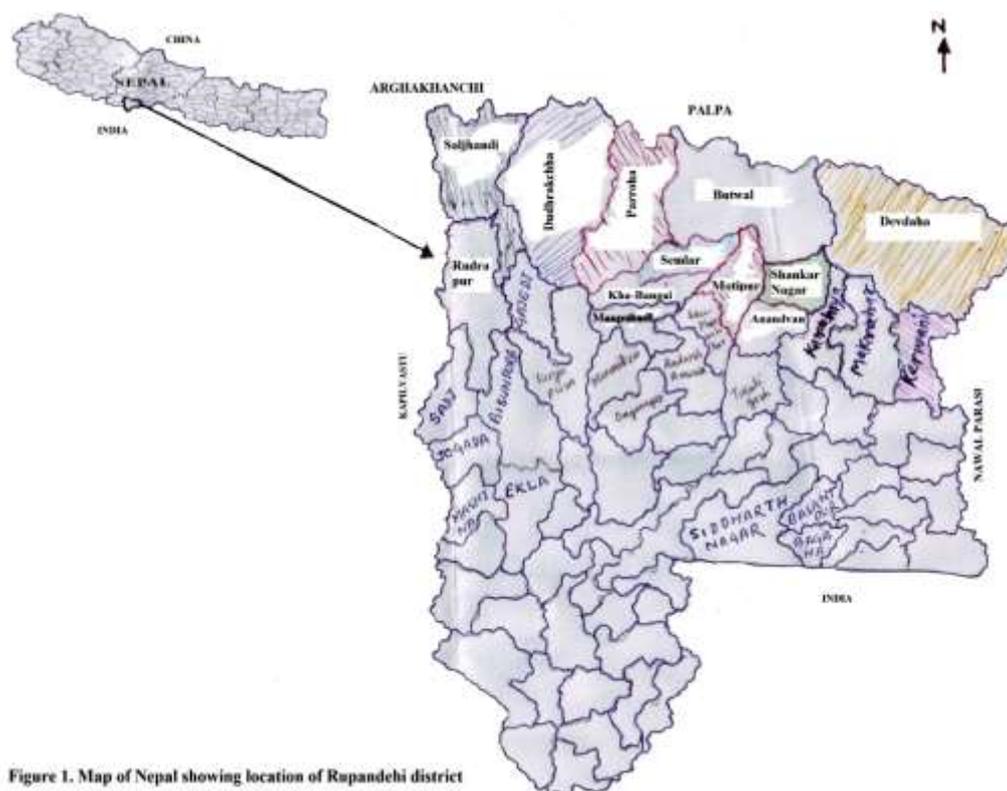


Figure 1. Map of Nepal showing location of Rupandehi district

Fig. 1: Location of Rupandehi in map of Nepal (DDC, Rupandehi)

The total population of this district is 708419 (District Profile of Rupandehi, 2010) Brahmin, Magar, Tharu, Muslim, Yadav, Chetry, Kewat, Chamar, Gurung, Newar, Kami, Teli, Kurmi, Koiri, Damai, Sonar, Thakuri are the major communities living in the district. Author visited villages and cities of Rupandehi district situated near the foothills of Churia like Butwal municipality, Gajedi, Rudrapur, Dudhraksh, Saljhandi, Parroha, Semlar, Motipur and Devdaha Village Development Committees. The study areas are inhabited by Brahmin, Thakuri, Chetry and ethnic communities like Magar, Gurung and Tharu.

Materials and methods

The present study was undertaken in and around the main city and villages situated near the churia hills of Rupandehi district in the month of June to April 2011-12. During data collection many thirty-five professional people, villagers etc., who involved in collection and cultivation of wild plants which were used as vegetables are interviewing by preparing a semi structured questionnaire. The professional people determined the local names and traditional uses of plants. The informations obtained were crosschecked with the users. The voucher specimens were identified with the help of relevant taxonomic literature viz., Hara *et al.*. (1978, 1979 and 1982), Sharma (1999) and herbarium specimens of Butwal Multiple Campus Tribhuvan University, Butwal, Nepal.

Results and Discussion

The study provides important evidence about traditional knowledge and diversity of wild leafy vegetables. The study area is floristically rich and includes useful wild leafy vegetable species. The present study show 51 wild leafy vegetable species belonging to 45 genera of 32 families tabulated with botanical name, local name, family, habitat and medicinal uses (Table 1). A maximum of 7 plants from

family Amaranthaceae, 3 from Brassicaceae, Chenopodiaceae respectively and 2 from Apiaceae, Liliaceae, Fabaceae, Asteraceae, Lamiaceae, Capparaceae, Polygonaceae, and Ophioglossaceae. Local name of the plants given by local people are compared with the book ‘Dictionary of Nepalese Plant Names’ written by Shrestha (1998). Out of 32 families’ 24 families belonging to dicots, 4 to monocots and 4 to ferns (Fig. 2). The majority of collected plant species were 35 herbs, 4 shrubs, 5 trees, 4 climbers, 2 runners and 1 creeper (Fig. 3).

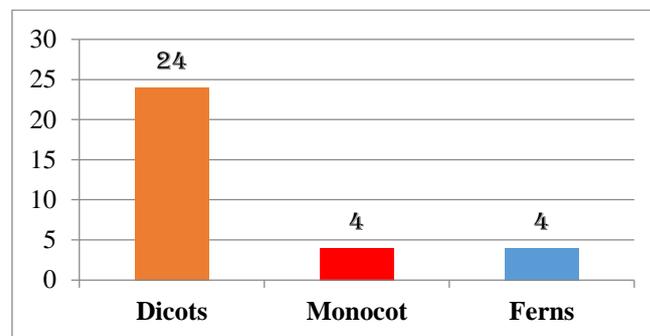


Fig. 2: Number of families belonging to classes of vascular plants

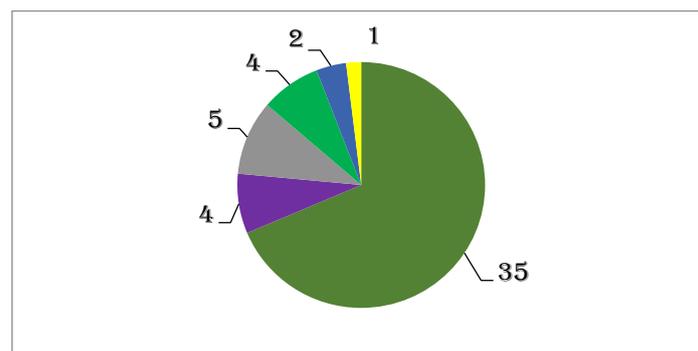


Fig. 3: Forms of the collected plants

Table 1: Details of plants studied

S.N.	Name of the plants and Family	Local Name	Form of the plants	Parts used	Season of availability	Ethnomedicinal Importance
1.	<i>Alternanthera sessilis</i> (L.)DC. Amaranthaceae	Saranchi Sag	Herb	Leaf	April-July	Diarrhoea & Skin diseases
2.	<i>Amaranthus caudatus</i> L., Amaranthaceae	Latte Sag	Herb	Leaf	April-Aug	Stomachache, Piles
3.	<i>Amaranthus lividus</i> L., Amaranthaceae.	Lude Sag	Herb	Leaf	April- Aug	Liver disorders, anaemia
4.	<i>Amaranthus spinosus</i> L., Amaranthaceae.	Ban Lude	Herb	Leaf	April-Aug	Liver disorders
5.	<i>Amaranthus tricolor</i> L., Amaranthaceae.	Rato Latte	Herb	Leaf	April-Aug	Antipyretic, Piles, Gastritis
6.	<i>Amaranthus viridis</i> L., Amaranthaceae.	Lude Sag	Herb	Leaf	April-Aug	Decoction is used in toothache, Piles

Table 1: Details of plants studied

S.N.	Name of the plants and Family	Local Name	Form of the plants	Parts used	Season of availability	Ethnomedicinal Importance
7.	<i>Angallis arvensis</i> L., Primulaceae	Armale	Herb	Leaf	Dec-Mar	Diuretic, liver & kidney problems
8.	<i>Anethum sowa</i> L. (Dill), Apiaceae	Saunf Sag	Herb	Leaf	Jan-July	Digestive and Respiratory disorders
9.	<i>Asparagus racemosus</i> Willd., Liliaceae	Kurilo	Herb	Tender Shoot	Feb-July	Diuretic, Cardiac dropsy, & Chronic gout
10.	<i>Bacopa monnieri</i> (L.)Pennell., Scrophulariaceae	Khole Sag	Herb	Tender Shoot	Feb-March	Dysentery, Nervous disorders
11.	<i>Basella alba</i> L. Basellaceae	Poi Sag	Climber	Leaf	June-Aug	Diuretic, & Appetizer.
12.	<i>Bauhinia variegata</i> L. Fabaceae	Koiralo	Tree	Tender Shoot	April-Sept	Stomach disorders
13.	<i>Bidens pilosa</i> L., Asteraceae	Kuro	Herb	Tender Shoot	May-June	Fresh leaf paste applied on wound
14.	<i>Blumea lacera</i> (Burm. f.) DC Asteraceae	Kurkure	Herb	Tender Shoot	May-June	Liver tonic, Bronchitis
15.	<i>Boerhavia diffusa</i> L., Nyctaginaceae	Punarnava	Herb	Tender Shoot	June-Aug	Gonorrhoea, hepatopathy.
16.	<i>Botrychium lanuginosum</i> Wall. ex. Hook & Grev. Ophioglossaceae	Jaluko	Herb	Shoot	May- July	Bodyache
17.	<i>Capsella bursa pastoris</i> (L.) Medikus Brassicaceae	Torigans	Herb	Leaf	Jan-April	Control bleeding from cut & wound
18.	<i>Cassia tora</i> L., Fabaceae	Tapre	Herb	Leaf	July-Aug	Typhoid fever, Dysentery, Leaf paste on skin disease
19.	<i>Celosia argentea</i> L., Amaranthaceae	Sirvari Sag	Herb	Leaf	Aug-Dec	Diuretic, Cough, Blood purification
20.	<i>Centella asiatica</i> (L.)Urb. Apiaceae	Ghod Tapre	Herb	Leaf	Feb-April	Diuretic, cardi tonic
21.	<i>Chenopodium album</i> L., Chenopodiaceae	Bethe	Herb	Tender Shoot	Jan-April	Anthelmintic.
22.	<i>Chenopodium gandhium</i> Buch-Ham. Chenopodiaceae	Kalo Bethe	Herb	Tender Shoot	Aug-Nov	Gastritis, Antipyretic
23.	<i>Cleome viscosa</i> L., Capparaceae	Ban Methi	Herb	Leaf	Aug-Oct	Muscular swellings, Cough, Fever
24.	<i>Colocasia esculenta</i> (L.) Schott, Araceae	Karkalo	Herb	Tender Shoot	Aug-Oct	Earache
25.	<i>Commelina paludosa</i> Bl., Commelinaceae	Kane Sag	Herb	Tender Shoot	April-Sept	Digestive disorders

Table 1: Details of plants studied

S.N.	Name of the plants and Family	Local Name	Form of the plants	Parts used	Season of availability	Ethnomedicinal Importance
26.	<i>Corchorus acutangulus</i> Tiliaceae	Nalu	Shrub	Leaf	June-Aug	Overcome anemic disease
27.	<i>Crateva unilocularis</i> Buch.-Ham., Capparaceae	Siplikan	Tree	Tender Shoot	Feb-April	Expel kidney stones, diabetes
28.	<i>Cucurbita maxima</i> Duchesne Cucurbitaceae	Pharsi	Climber	Tender Shoot	April-Oct	Cooling effect, stomachic
29.	<i>Dendrocalamus hamiltonii</i> Nees & Arn. ex. Munro, Poaceae.	Tamabans	Shrub	Tender Shoot	Throughout the year	Cooling, Inflammation in stomach
30.	<i>Diplazium esculantum</i> (Retz.) Sw.ex. Schrader, Woodsiaceae	Pani Neuro	Herb	Leaf	May-July	Digestive disorders
31.	<i>Dryoanthyrium boryanum</i> (Willd.) Ching. Aspidiaceae.	Kalo Neuro	Herb	Leaf	Aug-Oct	Stomach disorders
32.	<i>Fagopyrum esculentum</i> Moench., Polygonaceae.	Phapar	Herb	Leaf	May-June	Tonic, alternative food.
33.	<i>Ficus lacor</i> Buch.-Ham., Moraceae.	Kavro	Tree	leaf	May-June	Blood purifier
34.	<i>Ficus rumphii</i> Bl. Moraceae	Pakar	Tree	Leaf	May-June	Blood purifier, Stomach disorders.
35.	<i>Holarrhena pubescens</i> Wall. ex. G. Don. Apocynaceae.	Indra jau	Shrub	Leaf	May-June	Antidysenteric
36.	<i>Ipomea aquatica</i> Forssk. Convolvulaceae.	Kerunga Sag	Runner	Tender Shoot	May-Sept	Nerve tonic, Liver & digestive problems
37.	<i>Lepidium sativum</i> L., Brassicaceae	Chamsur	Herb	Tender Shoot	Dec-Feb	Liver tonic, Syphilis, bleeding piles, asthma, & cough.
38.	<i>Leucas cephalotes</i> (Roth) Spreng. Lamiaceae.	Gumma	Herb	Leaf	March-June	Digestive disorders, Toothache
39.	<i>Lygodium japonicum</i> (Thunb.) Sw., Schizaeaceae	Janai Lahara	Climber	Leaf	May-June	Gout, Muscular sprains
40.	<i>Mentha spicata</i> (L.), Spreng. Lamiaceae	Pudina	Creepers	Tender Shoot	Throughout the year	Cooling effect, gastrointestinal disorders
41.	<i>Moringa oleifera</i> Lam., Moringaceae	Shital Chini	Tree	Young leaf	March-June	Leaf poultice in glandular swelling
42.	<i>Murraya koenigii</i> (L.)Spreng. Rutaceae.	Karry Patta	Shrub	Leaf	Feb-June	Stomach disorders & vomiting
43.	<i>Ophioglossum petiolatum</i> Hook., Ophioglossaceae.	Jibre Sag	Herb	Leaf	Feb-April	Check bleeding from nose.

Table 1: Details of plants studied

S.N.	Name of the plants and Family	Local Name	Form of the plants	Parts used	Season of availability	Ethnomedicinal Importance
44.	<i>Oxalis corniculata</i> L., Oxalidaceae.	Chari amilo	Herb	Leaf	April-Oct	Burning sensation and hemorrhoids
45.	<i>Portulaca oleracea</i> L., Portulacaceae.	Nundhiki	Herb	Leaf	May-Oct	Urinary trouble, Diuretic
46.	<i>Rorippa nasturtium- aquaticum</i> (L.) Hayek, Brassicaceae.	Sim Sag	Runner	Tender Shoot	Oct-Feb	General Tonic
47.	<i>Rumex nepalensis</i> Spreng. Polygonaceae	Halhale	Herb	Leaf	Feb-March	Laxative, Stomachache
48.	<i>Smilax aspera</i> L., Liliaceae	Kuku diano	Climber	Leaf	May-June	Gastritis
49.	<i>Solanum nigrum</i> L., Solanaceae	Kali gedi	Herb	Leaf	May-June	Digestive disorders, diuretic
50.	<i>Spinacea oleracea</i> L., Chenopodiaceae	Gobre palungo	Herb	Tender Shoot	Aug-Dec	Diuretic & antibacterial
51.	<i>Urtica dioica</i> L., Urticaceae	Sisnu	Herb	Tender shoot	Throughout the year	Diabetes, diuretic, & anti- rheumatic

Conclusion

The peoples of the study area have good knowledge on use of wild plant species. Uses of wild leafy vegetables provide seasonal staple foods, and important alternative to the agriculturally cultivated crops. The study shows that wild leafy vegetable use is influence by traditional knowledge, culture and socio-economic conditions. Several wild leafy vegetables can benefit local people not as food, but also with their medicinal properties. Out of 51 wild leafy vegetables, 12 were threatened in their abundance by several human activities, unscientific harvesting, over-grazing, urbanization and invasive species. Therefore, proper management of these resources for the benefit of local communities as well as to conserve biodiversity is of the utmost importance and contributes to preserve cultural and genetic diversity.

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References

- Akhtar F (2001) Uncultivated food in the context of poor people's livelihood. A Naya krishi experience. In Johnston M.M. (eds.) Proceedings of the regional workshop on uncultivated foods and Biodiversity, September 24-26, Kathmandu, Nepal, pp8-17.
- Aryal KP (2010) Uncultivated plants in Nepal. An assessment of their richness and role in the livelihood and culture of two indigenous communities. LAP AMBERT Academic Publishing Gmbh and Co K.G. and Licensors, Germany.
- Banerji ML (1955) Some edible and medicinal plants from east Nepal *J. Bombay Nat. Hist. Soc.* **35**:153-155.
- Bhattarai NK (1989) Traditional phytotherapy among the Sherpa's of Helambu, Central Nepal. *Journal of Ethnopharmacology* **27**:45-54. DOI: 10.1016/0378-8741(89)90076-7
- Bhattarai NK (1990) Herbal folk medicines of Kabhre palanchok district, central Nepal. *Int. J. Crude Drug Res.* **28(3)**:225-231.
- Bhattarai NK (1991) Folk herbal medicines of Makawanpur district, Nepal. *Int. J. Pharmacognosy* **29(4)**:284-295. DOI: 10.3109/13880209109082899
- Bhattarai NK (1992) Medical ethnobotany in the Karnali zone, Nepal. *Economic Botany* **46(3)**:257-261. DOI: 10.1007/BF02866624

- Bhattarai NK (1993) Folk herbal medicines of Dolkha district, Nepal. *Fitoterapia* **64**(5):387-395.
- Bhattarai S, Chaudhary RP and Taylor RSL (2009) Ethnomedicinal Plants Used by the People of Nawal Parasi District, Central Nepal. *Our Nature* **7**: 82-99. DOI: 10.1186/1746-4269-2-47
- Bussmann RW, Gilbreath GG, Solio J, Lutura M, Latuluo R, Kunguru K, Wood N, Mathenge SG (2006) Plant use of the Maasai of Sekenani valley, Maasai Mara, Kenya. *Journal of Ethnobiology and Ethnomedicine* **2**:22. DOI: 10.1186/1746-4269-2-22
- Bussmann RW, Sharon D (2006) Traditional Medicinal Plant use in Northern Peru: tracking two thousand years of healing culture. *Journal of Ethnobiology and Ethnomedicine* **2**:47.
- Cavender A (2006) Folk medicinal uses of plant foods in Southern Appalachia United states. *Journal of Ethnopharmacology* **108**: 74-84. DOI: 10.1016/j.jep.2006.04.008
- CBS (2011) Population of Nepal: Village Development Committees/ Municipalities' population census 2011 Ram Shah Path, Thapathali Kathmandu, Nepal
- Coburn B (1984) Some native medicinal plants of the western. *Gurung Kailash* **11**(1-2): 55-88.
- District Profile (2010) District Development Committee, Rupandehi, Lumbini Zone, Nepal.
- Dobremez JF (1976) Exploitation and prospects of medicinal plants in eastern Nepal In: Mountain Environment and Development Swiss Association for Technical Assistance in Nepal, Kathmandu.
- Hara H and Williams LHJ (1979) An Enumeration of the Flowering Plants of Nepal. Vol. 2, British Museum (Natural History), London, UK.
- Hara H, Chater AO, and Williams LHJ (1982) Enumeration of the Flowering Plants of Nepal. Vol. 3, British Museum (Natural History), London, UK.
- Hara H, Stearn WT and Williams LHJ (1978) Enumeration of the Flowering Plants of Nepal. Vol. 1, British Museum (Natural History), London, UK.
- ICIMOD (2010) Mountain Biodiversity of the Hindukush-Himalayas International Year of Biodiversity, 2010.
- Joshi AR and Edington JM (1990) The use of medicinal plants by two village communities in the Central Development Region on Nepal. *Economic Botany* **44**(1):71-83. DOI: 10.1007/BF02861069
- Joshi KR (2008) Ethnomedicinal uses of Plants- A case study of Sharmol VDC, Darchula District, Nepal: Medicinal plants in Nepal. *An Anthology Contemporary Research* pp., 177-186
- Kunwar RM, Nepal BK, Kshhetri HB, Rai SK and Bussmann RW 2006. Ethnomedicine in Himalaya: a case study from Dolpa, Humla, Jumla and Mustang districts of Nepal. *Journal of Ethnobiology and Ethnomedicine* **2**:27. DOI: 10.1186/1746-4269-2-27
- Manandhar NP (1982) Wild Edible Plants of Nepal. Bull. Dept. Med. Pl., No. 11. Thapathali, Kathmandu, Nepal.
- Manandhar NP (1989) Useful Wild Plants of Nepal. Nepal Research Centre Publications No. 14. Steiner, Stuttgart, Germany.
- Manandhar NP (1990) Some endangered medicinal plants of Nepal. *Ancient Science of Nepal (India)* **9**(4):231-233.
- Manandhar NP (1992) Folklore medicine of Dhading District, Nepal. *Fitoterapia* **63**(2):163-177.
- Manandhar NP (1993a) Herbal remedies of Surkhet District, Nepal. *Fitoterapia* **64**(3):265-272.
- Manandhar NP (1993b) Ethnobotanical notes on folklore remedies of Baglung District, Nepal. *Contribution to the Nepalese Studies* **20**(2):183-196.
- Manandhar NP (1994) An ethnobotanical survey of herbal drugs of Kaski District, Nepal. *Fitoterapia* **65**(1):7-13.
- Manandhar NP (1995) A survey of medicinal plants of Jajarkot District, Nepal. *Journal of Ethnopharmacology* **48**(1):1-6. DOI: 10.1016/0378-8741(95)01269-J
- Manandhar NP (1998) Ethnobotanical census on herbal medicine of Banke District, Nepal. *Contribution to the Nepalese studies* **25**:57-63.
- Manandhar NP (1999) Conservation of medicinal plants in Nepalese forest: Problems and prospective. *Medicinal plant Conservation*. **5**:3-4.
- Manandhar NP (2002) Plants and People of Nepal. Timber Press Portland Oregon, USA.
- Mueller-Boeker U (1993) Ethnobotanical studies among the Chitwan Tharus. *Journal of Nepal Research Centre* **9**:17-56.
- Pandey BD (1964) The wealth of medicinal plants of Nepal. *Peking Symposium, China* pp183.
- Pandey HP (2008) Economic Botany Silver Line Publications 17/3 Mathura Road, Faridabad U.P. India.
- Panthi MP and Chaudhary RP (2003) Ethno medicinal Plant resources of Arghakhanchi District, West Nepal, *Ethnobotany* **15**: 71-86.
- Pieroni A, Houlihan L, Ansari N, Husain B and Astam S (2007) Medicinal perception of vegetable traditionally consumed by South-Asian migrants living in Bradford, northern England. *Journal of Ethnopharmacology* **113**:100-110. DOI: 10.1016/j.jep.2007.05.009
- Pohle P (1990) Useful plants of Manang district. Franz Steiner Verlag Wiesbaden GMBH, Stuttgart.
- Prescott-Allen OC and Prescott-Allen R (1990) How many plants feed the world? *Conservation Biology* **4**: 365-374. DOI: 10.1111/j.1523-1739.1990.tb00310.x
- Scherrer AM, Motti R, Weckerle CS. 2005. Traditional plant use in the areas of Monte Vesole and Ascea, Cilento National Park (Campania, Southern Italy) *Journal of Ethnopharmacology*, **97**: 129-143. DOI: 10.1016/j.jep.2004.11.002

- Sharma OP (1999) Plant Taxonomy Tata McGraw-Hill Publishing Company Limited, New Delhi, India
- Shrestha I and Pradhan N (1986) Medicinal plants of Chobhar village of Kathmandu district. *J. Nat. Hist. Mus.* **10**(1-4):65-72.
- Shrestha K (1998) Dictionary of Nepalese Plant Names, Mandala Book Point, Kantipath Kathmandu.
- Shrestha P (1985) Contribution to the ethnobotany of the Palpa areas. *Contribution to Nepalese Studies* **12**(23):63-74.
- Singh AG, Kumar A, and Tewari DD (2012b) An ethnobotanical survey of medicinal plants used in Terai forest of Western Nepal. *Journal of ethnobiology and ethnomedicine* **8**:19. DOI: 10.1186/1746-4269-8-19
- Singh AG, Panthi MP and Tewari DD (2012a) Wild Plants used as vegetables in Rupandehi District of Western Nepal and their ethnomedicinal importance. *J. Nat. Hist. Mus.* **26**:111-125.
- Singh AG, Poudel KN and Tewari DD (2011) Diversity of Cultivated and Wild medicinal Plants used by the People of Devdaha VDC of Rupandehi District West Nepal. *Current Botany* **2** (2):34-42.
- WCMC (World Conservation Monitoring Centre) (1994) Priorities for Conserving Global Species Richness and Endemism. In: Caldecott JO, Jenkins MD, Johnson T and Groombridge B (eds). World Conservation Press, Cambridge, UK.