

Diversity and Present Status of Medicinal Plants in and around Srinagar Hydroelectric Power Project in Garhwal Himalaya, India: Needs for Conservation

Jay Krishan Tiwari¹, Radha Ballabha¹ and Prabhawati Tiwari¹

1. Department of Botany, HNB Garhwal University, Srinagar Garhwal, Uttarakhand- 246 174, India
Author E-mail: jktiwari31@rediffmail.com, radhekuniyal.2007@rediffmail.com,
ptiwari29@rediffmail.com

Abstract: The present study has been carried out in Alaknanda valley around Srinagar Hydroelectric Power Project in Garhwal Himalaya, India, to document the medicinal uses of plants and their status of availability in the area. A total of 102 species belonging to 92 genera and 54 families were recorded from the study area. Out of the documented species 32 were herbs, 27 shrubs, 30 trees and the rest 13 were climbers. Of all the recorded plant species, 26 were abundant, 57 common and 19 uncommon to this area. A list of plant species along with their local names, plant part(s) used and mode of administration in different ailments has been given which can be utilized in the future for technological advancement, economic prosperity and providing employment opportunity to the local people. A management plan for conservation of medicinal plants in the hydroelectric power project area is also suggested. [Researcher. 2010;2(2):50-60]. (ISSN: 1553-9865).

Keywords: Hydroelectric Power Project, Garhwal Himalaya, plant diversity, ethno-medicine, distribution status, conservation.

1. Introduction

Ethnobotanical studies typically focus on recording the knowledge of traditional societies in remote places (Hodges and Bennett, 2006). Indigenous people of different parts of the world have a vast knowledge of, and capacity for, developing innovative practices and products from their environment. Indigenous knowledge grows from close interdependence between knowledge, land, environment and other aspects of culture in indigenous societies, and the oral transmission of knowledge in accordance with well understood cultural principles and rules regarding secrecy and sacredness that govern the management of knowledge (Tripathi *et al.*, 2000).

The developmental activities, particularly the constructions of hydroelectric power projects are causing a great loss of biodiversity in the Indian Himalaya. Hydroelectric power projects create environmental issues originating from submergence of large area including forest (Samant *et al.*, 2007). In order to study the status of plant diversity, the uses of plants made by the natives and the impact of construction of Hydroelectric Power Projects on the diversity, a study was conducted on Srinagar Hydroelectric Power Project (SHPP) being constructed on river Alaknanda in Garhwal Himalaya, India.

The aim of the present study was to evaluate the status and medicinal usage of local plants, to provide

safety and efficacy information to people who cannot afford Western prescription alternatives and to conserve the traditional knowledge highlighting sustainable utilization of plant wealth occurring in the area.

The degradation of biodiversity in the Himalayan region has reached dangerously at alarming state (Gupta, 1960; Gaur, 1999). The catchment area of rivers supports a large number of plant species of human use and scientific interest, including highly potential medicinal herbs; these require special attention for conservation (Uniyal, 1968; Gaur *et al.*, 1993).

In Garhwal Himalayan region, the plant diversity is declining rapidly due to various anthropogenic activities (Gaur, 1982). The sustainability and efficiency of forest ecosystems being influenced by the hydroelectric power projects in river valleys can be restored through strengthening the knowledge about sustainable plant utilization. Such utilization would be based upon the empirical knowledge of the local people and their perceptions.

Reduction in the number and quality of trees, shrubs and herbs and change in botanic composition of forests are strong indicators of unsustainable use of these renewable natural resources. On account of lack of knowledge and research on these groups of plants, the people of this region are unaware of this wealth of heritage.

2. Materials and methods

The study was conducted between 30° 13' 9"- 30° 14' 22.2" N latitudes and 78° 45' 47"- 78° 51' 58.6" E longitudes covering an area of approximately 100 km². Regular field study was made in the construction phase of the SHPP during the years 2008 and 2009 for the survey of the vegetation and ethnomedicinal uses. Ethnomedicinal information on plants was collected through interviewing local communities. The informants were medicine-men (*Vaidhyas*), peasants, shepherds, priests, village headmen and midwives. To determine the authenticity of information collected during field work, repeated verification of data from different informants was done. Thus, only the specific and reliable information, cross-checked with informants has been incorporated in the present study. A structured questionnaire was used to collect data on local plant names, uses, parts used, and mode of preparation and administration. Recorded herbs, shrubs and trees were identified with the help of Garhwal University Herbarium (GUH), local Floras and previous works of Duthie 1906; Osmaston, 1927; Rau, 1961; Naithani, 1984-85 and Gaur, 1999. The plants were divided into categories of abundant, common and uncommon based on their occurrence in the study area.

3. Results and discussion

The study revealed 102 medicinal plant species belonging to 54 families in Alaknanda valley around SHPP. The availability status and ethno-medicinal uses of the plant species are presented in (Table 1). Herbs were the primary source of medicines in terms of the number of species (32). The recorded species belong to different life forms, i.e., trees (30 species),

shrubs (27), and herbs (32) and climbers (13) (Figure 1). The families, Asteraceae (9 species), Lamiaceae (7), Caesalpiniaceae (6), Euphorbiaceae (5), Fabaceae (5), Solanaceae (5), and Rutaceae (4), were represented by higher number of species, respectively. *Cassia* (3 species), *Ficus* (3), *Terminalia* (3), *Abrus* (2), *Acacia* (2), *Artemisia* (2), *Bauhinia* (2), *Bidens* (2), *Euphorbia* (2), *Sida* (2) and *Solanum* (2) were the genera with more than one species being used (Table 1). As per plant parts used, maximum (24) species were used as leaves, followed by whole plants and fruits 18 each (Figure 2).

Assessment of various power projects deals mainly with execution and benefit to power related aspects, the actual environmental impact assessments are lacking due to little awareness, or non-availability of experts to consider biodiversity and environment associated inter-related factors. To avail the environmental clearance, project assessments are broadly based on listing of some easily identifiable groups of macrophytes and animals together with some soil or geological features (Garg *et al.*, 1995).

The catchment areas of river valley systems were once covered with dense vegetation, from alpine to submontane type, but in the recent past vegetation and associated biodiversity has declined manifold (Gaur, 1999). The present study indicates that the area harbors a high diversity of medicinal plants such as *Azadirachta indica*, *Erythrina variegata*, *Helicteres isora*, *Terminalia* spp., *Barleria cristata*, *Roylea cinerea*, *Berberis asiatica*, *Gloriosa superba*, etc. The inhabitants revealed rich presence of many of these species in the area in the past, which has restricted now to certain patches. If immediate steps for their sustainable utilization and conservation are not taken, these species may reach to the status of threatened in the area.

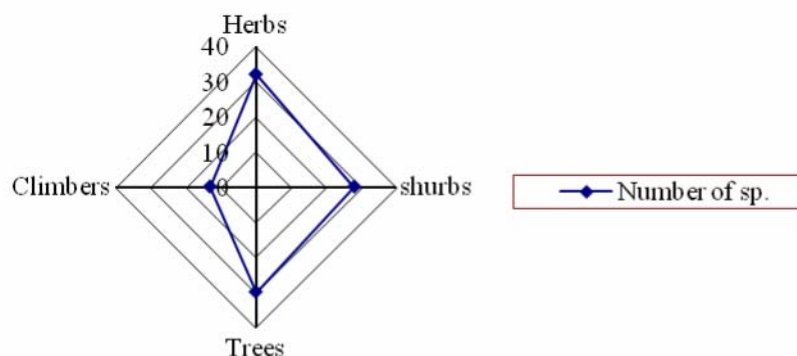


Figure 1. Medicines procured by local inhabitants from different life forms.

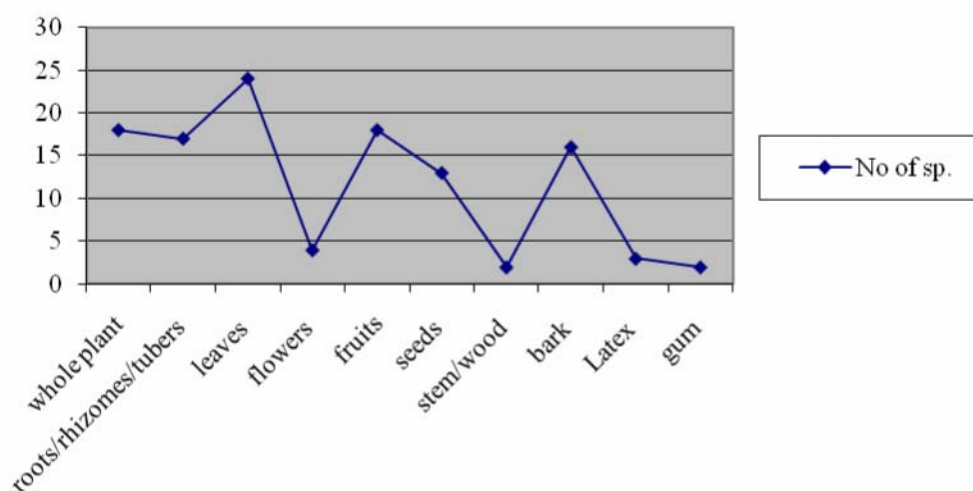


Figure 2. Plant parts being used for medicine by the inhabitants in the study area.

3.1 Management plan for conservation of medicinal plants in and around SHPP area

A large number of inhabitants of hill areas depend on plants as plants have been playing a vital role in the socio-economic development of such regions. They are the important source of subsistence, employment and raw material to various domestic uses. Their role in ecological balance, environmental stability, biodiversity conservation, food and health security and sustainable development therefore has been widely recognized. They are the source of various components, e.g., food, fodder, fiber, medicine and a number of other commodities of human requirement. It has been observed that the forest areas in the vicinity of the villages have been degrading at much faster rate than the forests growing far from the village locality. In the present study most of the plant species recorded are commonly distributed, thus requiring least concern, however, the species such as *Berberis asiatica*, *Gloriosa superba*, *Helicteres isora*, *Madhuca longifolia*, *Roylea cinerea*, *Rubia manjith*, *Terminalia bellirica*, *T. chebula*, *Zanthoxylum armatum*, etc., uncommon in their distribution coupled with heavy dependence of local inhabitants, are under threat due to construction of power project.

Thus, there is a need to conserve the plant resources on the ground level for the benefit of human beings and sustainable development of

environment. Besides that awareness to the local communities is essential how they can develop suitable techniques for sustainable utilization of plant resources.

The following points are suggested for the conservation of the plant diversity of this area:

1. There should be introduced appropriate technology requiring environmental impact assessment of proposed hydroelectric power projects likely to have significant adverse effects on biological diversity with a view to minimizing such effects and, where appropriate, allowing local communities' participation in such procedures.
2. New technologies should be developed for the conservation of plant diversity through the combination of indigenous and traditional knowledge with scientific and technical research.
3. Public awareness should be made by field oriented training programmes organized at the local level for community participation in various bioregions delineated for inventorying.
4. Large scale cultivation of economic and medicinal plant species by local communities should be encouraged to minimize the pressure on natural habitats.

Acknowledgement:

The authors are highly thankful to Prof. R. D.

Gaur for the help in identification of plant species and Prof. S.C. Tiwari, Head, Department of Botany, HNB Garhwal University Srinagar for providing the laboratory facilities.

Correspondence to:

J. K. Tiwari
Department of Botany
HNB Garhwal University, Srinagar Garhwal
Uttarakhand 246 174, India
Telephone: 01370-267417
Cellular phone: +919412949893
Email: jktiware31@rediffmail.com

References

- [1] Duthie JF. Catalogue of plants of Kumaon and of the adjacent portions of Garhwal and Tibet based on the collections made by Strachey and Winterbottom during the years 1846-1849. London. Reprint 1994, Bishan Singh Mahendrapal Singh, Dehradun.1906.
- [2] Garg JK, Saxena KG, Narayan A, Murthy TVR, Maikhuri R, Arya AS, Joshi V, Rao KS, Sati VP, Ghosh S. Report on Environment Appraisal of Tehri Dam Multipurpose River Valley Project Using Remote Sensing and GIS Techniques. Report Remote Sensing Application Group. SAC No PR/06/95, 1995.
- [3] Gaur RD, Negi KS, Tiwari JK, Pant KC. Notes on the ethnobotany of five districts of Garhwal Himalaya. *Ethnobot.* 1993;5: 73-81.
- [4] Gaur RD. Dynamics of vegetation in Garhwal Himalaya. In: Paliwal, G.S. (ed.) *Vegetational Wealth of the Himalayas*. Puja Publishers, Delhi. 1982;12-25.
- [5] Gaur RD. *Flora of the District Garhwal, North West Himalaya (with Ethnobotanical Notes)*. Trasmadia: Srinagar Garhwal. 1999.
- [6] Gupta RK. On the botanical trip to the source of river Ganga in Tehri-Garhwal, Himalaya. *Indian Forester.* 1960;86: 547-552.
- [7] Hodges S and Bennett BC. The ethnobotany of *Pluchea carolinesis* (Jacq.) G. Don (Asteraceae) in the Botanicas of Miami, Florida. *Econ. Bot.* 2006;60(1): 75-84.
- [8] Naithani BD. *Flora of Chamoli*. 2 Vols. Botanical Survey of India, Howrah.1984-85.
- [9] Osmaston AE. *A Forest Flora for Kumaun*. Government Press, Allahabad. Reprint 1990, shen Singh Mahendra Pal Singh, Dehradun.1927.
- [10] Rau MA. Flowering plants and ferns of north Garhwal, Uttar Pradesh, India. *Bull. Bot. Surv. India.* 1961;3:215-251.
- [11] Samant SS, Butola JS, Sharma A. Assessment of Diversity, Distribution Conservation Status and Preparation of Management Plan for Medicinal Plants in the Catchment Area of Parbati Hydroelectric Project Stage –III in Northwestern Himalaya. *Journal of Mountain Science.* 2007;4(1): 034-056.
- [12] Tripathi S, Varma S, Goldey P. Using plants for health: indigenous knowledge in health care in a tribal region of Bihar, India. *Int. J. Sust. Develop. & World Ecol.* 2000;7:321-332.
- [13] Uniyal MR. Medicinal Plants of Bhagirathi valley in Uttarkashi forest division, U.P. *Indian Forester.*1968;94:407-468.

Table 1. Diversity, availability status and indigenous uses of medicinal plant species in and around Srinagar Hydroelectric Power Project in Garhwal Himalaya, India.

Botanical name	Local name	Family	Status*	Plant parts used and mode of administration
Trees:				
<i>Acacia catechu</i> (L.f.) Willd.	Khair	Mimosaceae	+++	Decoction of wood and bark is given in cough and inflammations of throat. It is given in diarrhea, and applied on mouth sores.
<i>Acacia nilotica</i> (L.) Willd.	Kikar	Mimosaceae	++	Infusion of bark and leaves used in fever, bronchitis, asthma and dysentery.
<i>Aegle marmelos</i> (L.) Correa	Bel	Rutaceae	+++	Decoction of root is given in fever, cough and hoarse throat. Fruit pulp useful in diarrhea, dysentery and bronchial inflammation.
<i>Azadirachta indica</i> A. Juss.	Neem	Meliaceae	+	Bark paste is applied on wounds and in scabies. Decoction of bark is given in the fever. Leaf juice is poured in ear in ear pain. Leaf paste used as antiseptic in skin diseases.
<i>Bauhinia purpurea</i> L.	Guiral	Caesalpiniaceae	++	Bark paste used as a detergent of wounds, cuts and sores.
<i>Bombax ceiba</i> L.	Semal	Bombaceae	++	Gum from stem given in diarrhea, dysentery and leucorrhoea. Decoction of fruits is given in suppressed urination.
<i>Cassia fistula</i> L.	Amaltas	Caesalpiniaceae	++	Fruits are given to women to expel the placenta. Fruit pulp is given in asthma, bronchitis and skin diseases.
<i>Citrus aurantifolia</i> (Christ) Swing	Kagjee	Rutaceae	++	Leaf decoction inhaled in headache, cold and fever.
<i>Erythrina variegata</i> L.	Mandara	Fabaceae	+	Leaf juice is applied on sores. Bark decoction is given in fever. Leaf juice is used in dysentery, intestine worms and suppressed menses.
<i>Ficus palmata</i> Forsk.	Bedu	Moraceae	++	Fruits are used in digestive disorders. Latex is applied on the pimples.
<i>F. benghalensis</i> L.	Bargad	Moraceae	+	Infusion of bark is given in diarrhea. Latex is applied on sores and in headache.
<i>F. religiosa</i> L.	Peepal	Moraceae	++	Root bark, young shoots and fruit decoction is given in sexual weakness in men. Infusion of bark is given in constipation.
<i>Grewia optiva</i> J.R.Drummond ex Burret	Bheemal	Tiliaceae	++	Fruit is used in digestive disorders. Bark juice is given to women to facilitate

<i>Helicteres isora</i> L.	Bhendu	Sterculiaceae	+	delivery. It is also used as wash for sores.
<i>Juglans regia</i> L.	Akhrot	Juglandaceae	++	Fruit powder is given in diarrhea and spasmodic pain.
<i>Madhuca longifolia</i> (Koenig) Mac Bride	Mahwa	Sapotaceae	+	Leaves used as fungicide and insecticide and bark used in bone fractures.
<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	Ruina	Euphorbiaceae	+++	Bark paste is applied on cuts, plaster is applied on fractures, and decoction is applied on sores. Leaf ash is mixed with butter and applied on burns. The flower infusion is given in morning to cure diarrhea. Paste of bark, leaves and flowers is applied in swelling of breasts.
<i>Mangifera indica</i> L.	Aam	Anacardiaceae	++	Bark juice is given to children in diarrhea and dysentery. Paste of fruit powder is applied externally on cuts, wounds. Root and seed paste is applied on sores and skin eruptions.
<i>Melia azedarach</i> L.	Daikan	Meliaceae	++	Leaf juice and seed is given in diarrhea. Decoction of bark used in gonorrhoea, bark paste is applied on skin eruptions. Infusion of heart wood is given in asthma. Leaves, fruits and seeds are useful in skin diseases.
<i>Moringa oleifera</i> Lam.	Sunara	Moringaceae	++	Roots and other parts of tree used in arthritic pain and circulatory disorders. Decoction of bark is given to women to expel the dead foetus. Seed paste is used for soften skin.
<i>Ougeinia oojeinensis</i> (Roxb.) Hochr.	Sandan	Fabaceae	++	Gum used in digestive disorders. Decoction of bark is given in fever and applied externally on sores.
<i>Phyllanthus emblica</i> L.	Aunmla	Euphorbiaceae	++	Fruits are used in digestive disorders and fruit juice useful in leucorrhoea. Fruit powder is given in fever.
<i>Premna barbata</i> Wallich ex Schauer	Gaunta	Verbenaceae	++	Plant decoction is given in arthritic pain. Leaves are rubbed on the body in dropsy.
<i>Punica granatum</i> L.	Darim	Punicaceae	++	Fruit juice is given in diarrhea and rind of fruit is given with honey in cough and cold.
<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Melu	Rosaceae	++	Ripened fruits are used in digestive disorders. The fruit is crushed with teeth and juice is forced into the eyes of cattle in cataract and injuries.
<i>Sapindus mukorossi</i> Gaertner	Reetha	Sapindaceae	+	Fruits soaked in warm water and given as antidote of opium.
<i>Syzygium cumini</i> (L.) Skeels	Jamun	Myrtaceae	++	Root bark is given in cough. Fruit paste is applied on burns.

<i>Terminalia alata</i> Heyne ex Roth	Asin	Combretaceae	++	Bark is given in diarrhea, and dysentery, as gargle used in stomatitis. Bark used in liver disorders. Decoction of bark is given in diarrhea and leucorrhea. Externally the root pasties applied on cuts and used as a wash for sores.
<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Bahera	Combretaceae	+	Fruit powder used in dropsy, asthma, fever, cough and cold. Bark decoction is given in cough and headache.
<i>Terminalia chebula</i> Retz.	Heda	Combretaceae	+	The dried fruits used in indigestion with honey. Fruit mixed with the ginger juice is taken in loss of appetite.
Shrubs:				
<i>Adhatoda zeylanica</i> Mendikus	Basingu	Acanthaceae	+++	Root bark is given in fever. Young twigs used for cough and cold. Leaf juice with honey is given in cough and fever. Leaves and roots infusion useful in bronchitis and fever.
<i>Artemisia roxburghiana</i> Wallich ex Besser	Kunja	Asteraceae	++	Plant extract is given in fever and also used in skin diseases.
<i>Asparagus adscendens</i> Buch.-Ham. ex Roxb.	Jhirni	Liliaceae	+++	Tuberous roots with honey are used in dysentery.
<i>Barleria cristata</i> L.	Saundi	Acanthaceae	+	Leaves are crushed, mixed with seeds of black pepper and given orally in dyspepsia.
<i>Berberis asiatica</i> L.	Kingod	Berberidaceae	+	Stem bark and root juice used in eye afflictions. Infusion of root given in fever.
<i>Cannabis sativa</i> L.	Bhang	Cannabinaceae	+++	Leaves boiled with butter are taken in vomiting. Leaf juice poured in ear in ear pain. Leaves are used as an intoxicating agent.
<i>Cassia tora</i> L.	Chakunda	Caesalpinaceae	++	Leaves and seeds are used in skin diseases, cuts, wounds and bone fracture. Leaves and root also used as vermicide.
<i>Cassia occidentalis</i> L.	Chakunda	Caesalpinaceae	++	Leaves used in skin disease. Decoction of roots is given in dropsy. Leaf and root paste useful in piles and ringworms.
<i>Cestrum nocturnum</i> L.	Rat ki rani	Solanaceae	+	Plant extract used as antispasmodic.
<i>Colebrookia oppositifolia</i> J.E. Smith	Binda	Lamiaceae	+++	Leaf paste applied on cuts and wounds.
<i>Clerodendrum viscosum</i> Vent.	Lojjad	Verbenaceae	++	Leaf paste is applied externally to remove ectoparasites of cattle. Decoction of leaves is given orally to cure stone.
<i>Eupatorium adenophorum</i> Sprengel	Kharnabakura	Asteraceae	++	Crushed leaves applied on cuts and wounds.

<i>Euphorbia royleana</i> Boissier	Sulla	Euphorbiaceae	++	Latex is used as an antiseptic on cuts and wounds.
<i>Jatropha curcas</i> L.	Jangli Jamal Ghot	Euphorbiaceae	++	Seed oil is used as anthelmintic and applied externally in arthritis and skin diseases. Over doses of seeds are considered to be poisonous.
<i>Murraya koenigii</i> (L.) Sprengel	Kadi-pata	Rutaceae	+++	Bark, leaves and roots are used as insecticide.
<i>Nyctanthes arbor-tristis</i> L.	Har singar	Oleaceae	+	Leaf juice is given in fever, intestinal worms and applied externally on muscular pain.
<i>Reinwardtia indica</i> Dumortier	Phiuli	Linaceae	+++	Leaf juice is applied on cuts and wounds
<i>Rhus parviflora</i> Roxb.	Tungla	Anacardiaceae	+++	Stem ash applied on the abdomen for suppressed urination. Leaf juice is given in cholera
<i>Rosa brunonii</i> Lindley	Kunja	Rosaceae	++	Leaf juice used in cuts, wounds. Dried flower powder used in diarrhea.
<i>Roylea cinerea</i> (D.Don) Baillon	Karui	Lamiaceae	+	Decoction of leaves used in fever and pieces of branches made into bead and garlanded by infants to avoid jaundice.
<i>Rubus ellipticus</i> D.Don	Hisalu	Rosaceae	++	Root decoction is given in diarrhea. Juice of young shoots and roots is given in stomachache.
<i>Sida cordifolia</i> L.	Balu	Malvaceae	+++	Seed powder is given in dyspepsia. Plant juice applied on cuts and in arthritis. Root infusion is given in suppressed urination.
<i>Urtica dioica</i> L.	Kandali	Urticaceae	+++	Seed oil used as medicine in sciatica, arthritis and skin ailments.
<i>Woodfordia fruticosa</i> (L.) Kurz	Dhola	Lythraceae	++	Dried flowers paste used in cough and sprinkled over the sores. Flower juice is given with honey in dysentery.
<i>Xeromphis spinosa</i> (Thumb.) Keay	Maindal	Rubiaceae	++	Fruit pulp is given in dyspepsia. Fruit is given in asthma, cough. Leaf juice is applied in urticaria.
<i>Zizyphus mauritiana</i> Lam.	Ber	Rhamnaceae	++	Decoction of root and stem bark powder is given in fever, diarrhea and to improve digestion.
<i>Zanthoxylum armatum</i> DC.	Timru	Rutaceae	+	Leaves and fruits chewed for mouth wash and tooth care. Seed paste is applied on teeth in toothache.
Climbers:				
<i>Abrus precatorius</i> L.	Ratti dana	Fabaceae	++	Decoction of roots used for fever and cough. Seed paste is applied as plaster for bone fracture.
<i>Bauhinia vahlii</i> Wight & Arn.	Mallu	Caesalpiniaceae	++	Ash of dried leaves is taken in cough.
<i>Celastrus paniculatus</i>	Malkanni	Celastraceae	++	Seed paste is applied externally on

Willd.				wounds. Seed oil in rheumatic pain and also used in eye diseases.
<i>Clematis gouriana</i> Roxb. ex DC.	Kangulee	Ranunculaceae	++	Leaves poisonous to livestock.
<i>Cryptolepis buchananii</i> Roem. ex Schulf.	Dudhi	Asclepiadaceae	++	Leaves are poisonous to cattle and leaf powder is externally used in arthritis.
<i>Caesalpinia decapetala</i> (Roth) Alston	Kingri	Caesalpinaceae	+++	Leaves paste applied on burns and wounds.
<i>Cuscuta europaea</i> L.	Aarashbel	Cuscutaceae	++	Plant extract used in skin diseases.
<i>Gloriosa superba</i> L.	Kalihari	Liliaceae	+	Powder of tuber used in fever and infusion is believed to facilitate delivery and leaf powder used in skin diseases.
<i>Ipomoea nil</i> (L.) Roth.	Laglu	Convolvulaceae	++	Decoction of seed is given in fever and constipation. Seed paste is applied in urticaria.
<i>Momordica charantia</i> L.	Karala	Cucurbitaceae	++	Fruit and seed paste is given used in digestive disorders.
<i>Rubia manjith</i> Roxb. ex Fleming	Manjith	Rubiaceae	+	Stem used as an antidote to snake bite; roots are used as a tonic; flower extract used in bacillary dysentery.
<i>Tinospora sinensis</i> (Lour.) Merrill	Geloi	Menispermaceae	+++	Stem and leaf juice is given in fever and urinary disorders. Leave extract is given in leprosy.
<i>Vallisneria spiralis</i> (L.) L.	Safed bel	Solanaceae	++	Milky latex is applied externally on sores, cuts and wounds.
Herbs:				
<i>Achyranthes aspera</i> L.	Sajji	Amaranthaceae	++	Root infusion is given in fever. Leaf extract is given to women to facilitate delivery. Plant decoction is given in dropsy and bronchitis.
<i>Anaphalis adnata</i> Wallich ex DC.	Buggla	Asteraceae	++	Leaf paste is applied on cuts and wounds.
<i>Ageratum conyzoides</i> L.	Kansura	Asteraceae	+++	Root paste is applied on sores, cuts and various skin diseases.
<i>Ajuga bracteosa</i> Wallich ex Benth	Neelkanthi	Lamiaceae	+++	Leaf extract is given in fever. Plant extract used as a tonic.
<i>Aloe vera</i> (L.) Burm.f.	Ghrit-kumari	Liliaceae	+	Fleshy leaf is applied on wound and sore. Plant extract used as stomachic and anthelmintic.
<i>Argemone mexicana</i> L.	Pili-kateli	Papaveraceae	+++	Seeds are narcotic and emetic. Root decoction is used for to kill worms.
<i>Artemisia capillaris</i> Thunb.	Marwa jhirun	Asteraceae	++	Stem and leaf juice is given in fever and constipation. Root power used in stomachache.
<i>Aster peduncularis</i> Wallich ex Nees	Phulyan	Asteraceae	+++	Vegetable of leaf is useful at the initial stage of leprosy and leaf juice is applied on wounds and cuts.
<i>Bidens biternata</i> (Lour.)	Kura	Asteraceae	+++	Plant extract with honey is given in

Merrill & Sherff <i>Bidens pilosa</i> L.	Kummar	Asteraceae	++	cough and bronchitis. Vegetable of the plant useful in skin ailments.
<i>Boerhavia diffusa</i> L.	Panyaru	Nyctaginaceae	++	Roots chewed as tonic. Leaf extract used in eye diseases. Plant infusion is given in asthma and bronchitis.
<i>Chenopodium album</i> L.	Bhethu	Chenopodiaceae	+++	Seed decoction is given to women to expel the dead fetus and to bring the menses in order. Plant paste is applied in arthritis. Leaf paste is applied on worm infected cattle's sores.
<i>Cynodon dactylon</i> (L.) Pers.	Doob	Poaceae	++	Roots are taken in fever and internal injury.
<i>Delphinium danudatum</i> Wallich ex Hook. f.	Nirbisi	Ranunculaceae	++	Root paste is used in toothache.
<i>Datura stramonium</i> L.	Datura	Solanaceae	+++	Leaf paste mixed with turmeric is applied on body swellings and pains. Seed paste applied on sores. Seeds are warmed with mustard oil and used as a massage in arthritis.
<i>Euphorbia hirta</i> Linn.	Dudhi	Euphorbiaceae	++	Plant used in bronchial infection and asthma. Latex is applied on warts.
<i>Geranium occellatum</i> Cambess.	Kaphlya	Geraniaceae	++	Roots are used as an antiseptic. Root extract is given in liver troubles and fever.
<i>Micromeria biflora</i> Buch.- Ham. ex D. Don	Gorkhopan	Lamiaceae	+	Crushed leaves inhaled in cold and sinusitis. Leaf extract with milk is given in gastroenteritis.
<i>Mentha arvensis</i> L.	Pudina	Lamiaceae	++	Plant extract used in vomiting and indigestion.
<i>Musa paradisiaca</i> L.	Kela	Musaceae	++	Spadix used in cough and cold.
<i>Ocimum sanctum</i> L.	Tulsi	Lamiaceae	+++	Plant used in fever, cold, cough, colitis, urinary troubles and vomiting.
<i>Oxalis corniculata</i> L.	Chilmori	Oxalidaceae	+++	Leaf juice dropped in cataract and conjunctivitis.
<i>Perilla frutescens</i> (L.) Britton	Bhangjeera	Lamiaceae	+	Plant extract or power of dried plant parts used for cold, cough, bronchitis and uterine ailments; leaf paste applied on arthritis.
<i>Rumex hastatus</i> D. Don	Almor	Polygonaceae	+++	Leaf extract applied on cuts and wounds to check bleeding.
<i>Sida cordata</i> (Burm. F.) Borss. Waalk.	Kangi	Malvaceae	++	Leaves and root bark used in gonorrhoea.
<i>Solanum erianthum</i> D. Don	Kandela	Solanaceae	++	Paste of root, leaf and fruit is applied on cuts, wounds and burns. Root and leaf extract is used in urinary trouble and skin diseases.
<i>S. nigrum</i> L.	Makoy	Solanaceae	+++	Plant extract is given in liver trouble, piles and dysentery. Fruits are useful in diarrhea, fever and eye diseases.

<i>Stellaria media</i> (L.)Villars	Badalu	Caryophyllaceae	+++	Plant paste is externally applied on burns, wounds and boils.
<i>Trigonella incisa</i> Benth.	Jangli methi	Fabaceae	++	Vegetable is useful in diabetes.
<i>Tridax procumbens</i> L.	Kumra	Asteraceae	++	Plant paste is used to heal wounds and cuts.
<i>Verbascum thapsus</i> L.	Akulbeer	Scrophulariaceae	++	Plant extract used in bronchitis and asthma. Seeds are used as sedative.
<i>Viola canescens</i> Wallich	Dundivirali	Violaceae	++	Decoction of plant useful in fever and bronchitis. Root is used as an emetic. Leaf juice is applied on cuts and wounds.

* +++ = Abundant, ++ = Common and + = Uncommon

01/02/2010