

ETHNOBOTANY OF MEDICINAL PLANTS OF LEEPA VALLEY (AZAD KASHMIR)

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ABSTRACT

Natural regeneration of medicinal plants is adversely affected by a number of climatic and edaphic factors (earthquake). Drug plants occurring at higher elevations acquire perennial nature due to short growing season of 4 to 6 months and hence require a prolong growth periods of 6 to 10 years depending upon plant species concerned. Disturbance in the regeneration pattern is also affected by heavy grazing and intensive felling of trees in particular area. Due to increase in population and simultaneously of animals the grazing pressure has increased tremendously and thus unpalatable or even poisonous plants though not eaten but are trampled so heavily that regeneration and survival of the plant become extremely difficult. Therefore, there is a need of coordination and cooperation amongst various agencies such as Forest Department, farmers, traders and pharmaceutical firms interested in the utilization of these medicinal plants of pharmacopoeial importance and to initiate regeneration work in Leepa valley, Azad Kashmir. For this purpose, in-situ conservation area and gene bank must be established of higher elevation medicinal plants like *Saussurea lappa*, *Podophyllum emodi*, *Atropa acuminata*, *Rheum emodi*, *Angelica glauca*, *Adiantum capillus*, *Dioscorea deltoidea*, *Digitalis* spp., *Berberis lycium*, *Geranium wallichianum*, *Berginia ciliata*, *Solanum nigrum* etc., for supply of quality seed and planting stock for other areas. Medicinal plants are a valuable natural resource and regarded as future of safe drugs. Sustainable management of this renewable natural resource is an important issue which needs to be discussed at national level. Because it not only provides basic raw material for the preparation of a number of allopathic medicines, but also more than 70% of the population residing in rural and remote hilly areas rely on plant-lore and traditional system of medicine for their primary health care.

INTRODUCTION

Pakistan occupies a unique position among developing countries. It has good potential of a variety of medicinal and aromatic plants due to its varied climate and eco-systems, which reflect bio-diversity and valuable plant heritage. More than 6000 species of flowering plants have been reported to occur in Pakistan including Azad Kashmir. A large number is found in northern and northwestern parts of the country. Out of these, 1012 plant species have been recognized for phyto-chemical properties; whereas 350–400 plant species are traded in different drug markets of the country and are used by 28 leading manufacturing units of Greco-Arabic, Ayurvedic and Homeopathic medicines. A large number of un-registered practitioners scattered in rural and remote hilly areas utilizing more than 200 drug plants in traditional and folk medicines as household remedies against several diseases in primary health care.

Ali (1973 & 1983), Ghafoor (1974), Jafri (1973), Nasir (1977) and Qaiser (1982) provided a detailed account of the uses of different plant species by local population of Azad Kashmir. Hooker (1874-1897), Stewart (1972), Ali & Nasir (1970-89) narrated that the traditional use of plant by locals. Haq and Hussain (1995) surveyed the medicinal plants of Palandri, District Poonch and revealed that there were 47 such plants in the area. The local names in Pehari, Urdu, Punjabi and Pashto were given. The local uses of

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the plants were enquired from the local people and medicinal uses of the plants were also discussed in detail. Khan (1996) recorded more than 202 plant species from the Machiara National park area, Azad Kashmir. Local people are dependent on these plant resources for different requirements. About 80 plant species are used extensively in the area. Muhammad Ishtiaq *et al*; (2001) conducted an exhaustive survey in Samahni valley, in Azad Kashmir to collect ethnomedicinal and ethnobotanical data which was being used by tribal people for population control and sexual diseases. They reported the use of 36 plant species distributed in 26 families to treat sexual diseases and control birth rate in Samahni valley. Sultana *et al*; (1996) reported a total of 56 edible species of mushrooms from Pakistan. These include 4 species from Baluchistan, 3 from Sindh, 5 from Punjab and 44 from NWFP and Azad Kashmir. Some of the species that are being commercially exploited in the world include *Agaricus bisporus*, *Auricularia spp.* and *Coprinus comatus*. *Flammulina vellutipes*, *Lentinus edodes*, *Phellurina inquinans*, *Pleurotus ostreatus*, *Stropharia rugosoatnnulata* and *Volvariella volvacea*. Tanvir and Jamshed Malik (2002) described the flora of Leepa valley. They recorded sixty two species of angiosperms.

The uncontrolled and haphazard exploitation of important medicinal and aromatic plants such as *Saussurea lappa*, *Podophyllum emodi*, *Rheum emodi*, *Dioscorea deltoidea*, *Atropa acuminata*, *Angelica glauca*, *Digitalis sp.*, *Aconitum sp.*, *Valeriana jatamansi*, etc., are in eminent danger of extinction and listed in CITES (Convention of International Trade of Endangered Species). This warrants the need for the protection of natural habitats of medicinal and aromatic plant species to conserve genetic diversity for continuation of evolutionary process. These genetic reservoirs can be utilized for genetic manipulation to improve yield, resistance to diseases of field crops and bio-medical research to combat deadly diseases like AIDS, Hepatitis, Cardio-vascular and Cancer etc. Similarly many plants have good potential to manufacture life saving and pain killing drugs from their derivatives like digitoxin and digoxin derived from *Digitalis purpurea* used in the treatment of cardio-vascular disease.

Leepa valley:

Karnah Patti now Leepa valley declared as Kashmir-e-Sagheer by Nazir Ahmed. Tashna having Nallah Qazi Nag in the centre, earlier in the history known as Kishan-ganga valley located in the north west of Kashmir below the Nanga Parbat. Astore and Chilas lies in its north, Kaghan valley in the west, occupied Kashmir in the east and Muzaffarabad in the south. It is situated between 78.59 and 88.48 latitude with altitude range of 1500-5000 metres. Places of low altitude show at tropical climate, places in elevations a sub alpine and alpine climate, the middle part exhibit a temperate climate. Valley and hills receives well distributed high rain fall 2800mm to 3000mm. Mountain remain covered with snow for six months during December to March.

The most fascinating valley of Azad Kashmir, Leepa lies towards the east of the capital Muzaffarabad, at a distance of 95km. A narrow metalled road along the right bank of River Jhelum leads to Reshian, and along the way one passes Ghari Dupatta, Dhanni Baqalan, Hattian Bala, Neili and Sain Bagh. Leepa is a small village about 60 kilometers from Neili and 38 kilometers from Reshian, at an altitude of 1921 meters. Leepa valley comprising an area of 14,200 hectares lies in Karnah Forest Range. The rich vegetation of Leepa valley represents all major groups of plant kingdom including endemics. The vegetation is not overgrazed as most high meadows were in Kashmir. It is an ideal

territory for collection and important as a reservoir of tremendous floristic diversity.

Keeping in view the floral richness, their local uses, danger of this knowledge being lost, conservation status and endemism, the ethno-botanical survey of the Leepa valley has been conducted with following objectives.

The objectives of the study were:

- To find out floristic composition, current status of medicinal, aromatic and economic plants growing in the area.
- To assess the economic importance of medicinal plants for local people from domestic/national/international market and to raise awareness among villagers about market prices.
- Dissemination of knowledge on medicinal plants to create awareness among people for their development and sustainable uses.

MATERIALS AND METHODS

A study on the ethno-botanical and economic evaluation of medicinal and aromatic plants of the Leepa valley of Azad Kashmir was conducted during spring 2007. Prior to exploring the forest resources, topo-sheet, map and other general information of the area were obtained from Forest Department Azad Kashmir. Questionnaire was used as a tool for the collection of information. The questionnaire was divided into two parts, part first include personal information such as name, locality, age, education and profession etc., while the part second was specific the pattern of forest resources utilization.

Field Survey

The traditional uses (including medicinal and other uses) of plant resources were gathered from the local people. Generally, the respondents were elderly person and their age group varies from 40-60 years were interviewed. Their interest as local user, collectors and traders of the forest resources were documented through questionnaire. Data on the marketing of NTFPs in general and MAPs in particular were gathered from the local experienced persons through interviews and discussions. Information on the market value of the plants was collected from local collectors, hakims, shopkeepers and Army personnel. A simple procedure was adopted as to how, from whom, and to whom the plants were sold.

For every economically and ethno-botanically important plant species the local inhabitants were also asked about its abundance, distribution and population size. In addition personal observations were made in the fields to note any pertinent events, which could help gain better understanding of the presence, relative abundance based on the ecological characteristics of the species. The plants were collected from different sites of the studied valley and were dried and preserved properly. The fully dried specimens were mounted on herbarium sheets with scotch tape, plants were identified with the help of available literature (Nasir and Ali, 1971-91, Stewart, 1972). The nomenclature was confirmed from Herbarium of Pakistan Forest Institute Peshawar.

Leepa valley is divided in the following ecological zones

Alpine

Mandol Top, Barahzari, Shamasbari, Chatkari, Khuppi (3200m), Kalabut (4200m), Bali Top (3000m), Panjal Top (3300m), Kafar Khum (4200m), Tahle Top (3500 m).

Sub alpine

Kafar Khum, Enga-gali, Khapi Top, Sudphara, Marooi, Jabbi.

Temperate

Mandocoli, Kolim andal, Sanai, Batwar-gali, Shed-gali, Jammua, Gorsu Top, Ghansari Top, Shabdori, Leepa village and surrounding villages.

Tropical and Subtropical

Chatkari, Sudpura. Flora of the area is divided as under:

Sub Tropical (1200-1400m)

Pinus roxburghii

Dry Temperate (1600-2100m)

Pinus griffithii, *Cedrus deodara*, *Quercus baloot*, *Q. dilata*, *Q. glauca*, *Q. incana*, *Q. semecarpifolia*.

Montane (2100-2300m):

Cedrus deodara, *Pinus griffithii*, *Abies pindrow*, *Picea smithiana*, *Juglans regia*, *Aesculus sp.*, *Acer sp.*

Sub alpine (2300-3300m)

Abies pindrow, *A. spectabilis*, *Pinus griffithii*, *Alnus nitida*, *Picea smithiana*, *Desmodium*, *Indigofera sp.*

Alpine (3300 and above)

Oxyria digyna, *Thymus linearis*, *Geranium wallichianum*, *Primula macrophylla*, *P. rosea*, *Aconitum rotundifolium*, *Peganum hermala*, *Rosa webbiana*, *Betula utilis*, *B. alnoides*, *Salix tetrasperma*, *Rhododendron arboretum* and *R. campanulatum*.

RESULTS AND DISCUSSIONS

The following plant species of ethnobotanical importance were recorded from Leepa valley and described. This paper will generate wide interest in protecting and conserving plant diversity and richness. Further study is, however, required to quantify the availability of important species and to suggest conservation measures with the participation of local communities.

Plants used as medicine

Local people use the medicinal plants for curing different diseases. Some of them are *Saussurea lappa*, *Podophyllum emodi*, *Rheum emodi*, *Valeriana wallichii*, *Angelica glauca*, *Adiantum capillus*, *Dioscorea deltoidea*, *Fagopyrum tataricum*, *Rumex acetosa*, *Rumex hystrix*, *Viburnum mullaha*, *Vernonia anthelmintica*, *Chenopodium album*, *Silybium marrianum*, *Inula cuspidata*, *Filago pyramidata*, *Eclipta prostrata*, *Chrysanthemum parthenium*, *Cichorium intybus*, *Digitalis sp.*, *Amaranthus viridus*, *Achillea millefolium*, *Helianthus annuus*, *Taraxacum officinale*, *Berberis lycium*, *Cuscuta reflexa*, *Fumeria indica*, *Geranium wallichianum*, *Mentha longifolia*, *Plantago major*, *Rumex nepalensis*, *Rosa indica*, *Berginia ciliata*, *Solanum nigrum* and *Viola canescens*.

Fodder and forage species

Several plant species are used as food and fodder partially or wholly, leaves of many plants are used as forage for animals like goat, sheep such as *Quercus incana*, *Ficus palmata*, *Morus alba*, *Morus nigra* and *Olea feruginea*.

Important fruit yielding plants

Juglans regia, *Morus alba*, *Prunus arminica*, *Prunus persica* and *Pyrus malus* are the important fruit yielding plants of surveyed area.

Timber yielding plants

Juglans regia, *Populus nigra*, *Abies Pindrow*, *Pinus roxburghii*, *Pinus wallichiana* and *Cedrus deodara* are important timber yielding plants.

Plants used in construction

Abies pindrow, *Pinus roxburghii*, *Pinus Wallichiana*, *Populus nigra*, *Ficus Palmata* and *Quercus incana* are commonly used in construction purposes.

Plants used to acquire fuel

Taxus baccata, *Aesculus indica*, *Cedrus deodara*, *Berberis lycium*, *Viburnum grandiflorum*, *Quercus dilatata*, *Quercus incana*, *Acacia nilotica*, *Ficus Palmata*, *Morus alba*, *Indigofera heterantha*, *Abies pindrow*, *Pinus roxburghii*, *Pinus wallichiana*, *Populus nigra* and *Salix tetrasperma*.

Poisonous plants of the area:

Arisaema jacquemontii and *Urtica dioica* are considered as poisonous plants.

Local and indigenous uses of medicinal plants in Leepa valley.

Botanical name	:	<i>Achillea millefolium</i>
Local name	:	Chopandiga
Family	:	Compositae
Status	:	Herb

Medicinal uses

Flower is laxative, diuretic, stimulant and chewed for toothache. It is also a tonic to brain. Leaves and floral parts are crushed, mixed with water and are taken in the case of fever, chest burn and for blood purification.

Botanical name	:	<i>Artemisia maritima</i>
Local name	:	Spirah tarkha
Family	:	Compositae
Status	:	A bushy shrub

Medicinal uses

The flower heads are anthelmintic and vermifuge. It is also used against infantile spasms, whooping cough and bed-wetting. Santonin from flower heads, a useful anthelmintic.

Botanical name	:	<i>Aconitum chasmanthum</i>
Local name	:	Mohri, ban-balnag
Family	:	Ranunculaceae
Status	:	Herb

Medicinal uses

Dried roots are used as anodyne, diaphoretic and diuretic. It is a useful anodyne in facial neuralgia. Alkaloid 'Aconitine' is used externally in various forms of tetanus, chronic rheumatism, gout and heart diseases. It is used internally in fever and for relieving pain.

Botanical name	:	<i>Aconitum heterophyllum</i>
Local name	:	Atis
Family	:	Ranunculaceae
Status	:	Herb

Medicinal uses

The root is antiperiodic, aphrodisiac, astringent, tonic and is used in diarrhea,

dyspepsia and cough. It is a valuable remedy for combating debility and after fever it is an excellent tonic and aphrodisiac.

Botanical name	:	<i>Acorus calamus</i>
Local name	:	Bach
Family	:	Araceae
Status	:	Herb

Medicinal uses

The root is poisonous. It is used as a substitute for the imported tubers of *Aconitum napellus* of European species to which it is closely allied.

Botanical name	:	<i>Adhatoda vasica</i>
Local name	:	Arusha
Family	:	Acanthaceae
Status	:	Small shrub

Medicinal uses

The leaves are a powerful expectorant and antispasmodic. They are chiefly used in diseases of the respiratory tract, particularly in tuberculosis, all kinds of coughs, asthma and other chest diseases. The leaves, roots, flowers and bark are commonly employed for the treatment of snake bites and their poultice is applied to the wounds.

Botanical name	:	<i>Adiantum capillus-veneris</i>
Local name	:	Kakwi
Family	:	Filicineae
Status	:	Herb

Medicinal uses

Fronds used against scabies and decoction are febrifuge.

Botanical name	:	<i>Angelica glauca</i>
Local name	:	Chora
Family	:	Umbelliferae
Status	:	Herb

Medicinal uses

The herb is cordial stimulant and is used in dyspepsia and constipation.

Botanical name	:	<i>Asparagus adscendens</i>
Local name	:	Safed musli
Family	:	Liliaceae
Status	:	Herb

Medicinal uses

Tubers are used in chronic leucorrhoea, diarrhea, dysentery and general debility.

Botanical name	:	<i>Atropa acuminata</i>
Local name	:	Galakafal
Family	:	Solanaceae
Status	:	Herb

Medicinal uses

The leaves and roots are used as sedative, antispasmodic and narcotic. The dried leaves are smoked as an antispasmodic. It is usually an important constituent of preparations rheumatism and inflammations as of the breast.

Botanical name	:	<i>Amaranthus viridis</i>
Local name	:	Ganyar
Family	:	Amaranthaceae
Status	:	Herb

Medicinal uses

Plant used as anthelmintic, also used to cure piles. Decoction of root is used in gonorrhoea. Leaves are used as vegetable.

Botanical name	:	<i>Arisaema jacquemontii</i>
Local name	:	Samp ki maki
Family	:	Araceae
Status	:	Herb

Medicinal uses

Plant is considered as poisonous.

Botanical name	:	<i>Berberis lycium</i>
Local name	:	Kashmal
Family	:	Berberidaceae
Status	:	Shrub

Medicinal uses

Roots are bitter with an unpleasant taste. Stem and roots are used in ophthalmia, fruit is laxative and used in spleen trouble. Extract of leaves also used for healing wound. Bark is used for healing intestinal or other internal wounds, throat infection against diabetes and toothache. Leaves used for cure of jaundice. Plant extract is good for cough, chest and throat trouble.

Botanical name	:	<i>Berberis vulgaris</i>
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Local name	:	Zirishk, chochar
Family	:	Berberidaceae
Status	:	Shrub

Medicinal uses

The plant and bark used as diuretic, astringent, refrigerant and anti-bilious. 'Berberine' a yellowish alkaloid is used in disorders of the bile and urinary passages especially in biliary and renal calculi.

Botanical name	:	<i>Bergenia ciliata</i>
Local name	:	Butphya
Family	:	Saxifragaceae
Status	:	Herb

Medicinal uses

Dried powder of leaves and roots is used in healing wound. Extract of leaves and root is used in dysentery, stomach and back bone pain.

Botanical name	:	<i>Cannabis sativa</i>
Local name	:	Bhang
Family	:	Urticaceae
Status	:	Shrub

Medicinal uses

The plant is a narcotic drug and is also used for malaria, fever, blood poisoning, anthrax and dysentery. The leaves are narcotic, anodyne, sedative, antispasmodic, diuretic, digestive and astringent.

Botanical name	:	<i>Chenopodium album</i>
Local name	:	Bathu
Family	:	Chenopodiaceae
Status	:	Herb

Medicinal uses

Leaves and seeds are laxative, diuretic and anthelmintic, useful in abdominal pain. Leaves are used as vegetable.

Botanical name	:	<i>Colchicum luteum</i>
Local name	:	Bekh-lafah
Family	:	Liliaceae
Status	:	Herb

Medicinal uses

The corms are used as carminative, laxative and aphrodisiac. It is also given in gout, diseases of liver and spleen. The corms are also employed as an external application for lessening inflammation and pain.

Botanical name	:	<i>Datura stramonium</i>
Local name	:	Dathura
Family	:	Solanaceae
Status	:	Small shrub

Medicinal uses

The fruits are sedative. The juice of flowers is useful for earache. The juice of fruits is applied to scalp for curing dandruff and falling hair.

Botanical name	:	<i>Digitalis purpurea</i>
Local name	:	Berg-al-azra
Family	:	Scrophulariaceae
Status	:	Herb

Medicinal uses

Digitalis is mainly used for its effect on the cardiovascular system increasing the force of systolic contraction and efficiency of the decompensate heart. It is used as myocardial stimulant in congestive heart failure. Its local effect consists in irritation and an ointment of digitalis glycoside is said to be useful for cleaning wounds. In cases of burns it is more effective in preserving cells severally injured by heat.

Botanical name	:	<i>Dioscorea deltoidea</i>
Local name	:	Kanis, kildri
Family	:	Dioscoreaceae
Status	:	Herb

Medicinal uses

The tubers are employed in the treatment of bilious colic and as a diuretic and expectorant. They are also used to kill lice and fish poison. The tubers are a very good source of diosgenin which is a starting material for hormone preparation. It is also used in soap.

Botanical name	:	<i>Elaeagnus latifolia</i>
Local name	:	Kankoli
Family	:	Elaeagnaceae
Status	:	Shrub

Medicinal uses

Flowers of the plant are used as cardiac. Fruit is laxative and useful in skin diseases.

Botanical name	:	<i>Fagonia bruguieri</i>
Local name	:	Duma
Family	:	Zygophyllaceae
Status	:	Spiny shrub

Medicinal uses

The plant is given as febrifuge and tonic. It is also used in chronic fever and in any disorders which arise from poisoning.

Botanical name	:	<i>Geranium wallichianum</i>
Local name	:	Rathon Jot
Family	:	Geraniaceae
Status	:	Herb

Medicinal uses

Herb possesses astringent properties and employed as care for toothache. Tea is prepared from juice that removes rheumatism.

Botanical name	:	<i>Hyocyamus niger</i>
Local name	:	Bazarbang
Family	:	Solanaceae
Status	:	Herb

Medicinal uses

Leaves are sedative, narcotic, anodyne, antispasmodic and are employed in irritable conditions and nervous affection. They are also used in asthma and whooping cough. The seeds are tonic and astringent to the bowels.

Botanical name	:	<i>Inula royleana</i>
Local name	:	Rasan
Family	:	Compositae
Status	:	Herb

Medicinal uses

It is used in chronic bronchitis and rheumatism, used in veterinary medicine as tonic and stomachic. Moreover, this plant is used to adulterate *Saussurea lappa*.

Botanical name	:	<i>Mentha arvensis</i>
Local name	:	Pudinah

Family	:	Labiatae
Status	:	Herb

Medicinal uses

The dried plant is antispasmodic, carminative, stomachic, refrigerant, stimulant and diuretic. Mint herb is aromatic and is used in chutneys. A decoction of its tea is largely used with lemon grass as a febrifuge in fevers. Oil is extracted from the plant and used to prevent vomiting.

Botanical name	:	<i>Oryza sativa</i>
Local name	:	Thain
Family	:	Gramineae
Status	:	Cereal

Medicinal uses

Rice water is demulcent, refrigerant, soothing and useful in inflammatory state of intestine. Rice gruel is used in dysentery, diarrhea and bowel complaints.

Botanical name	:	<i>Oxalis corniculata</i>
Local name	:	Ambuti
Family	:	Geraniaceae
Status	:	Herb

Medicinal uses

The juice of the plant is given in stomach troubles. The leaves are also considered cooling, refrigerant and stomachic. It is also used in dysentery.

Botanical name	:	<i>Paeonia emodi</i>
Local name	:	Chandra
Family	:	Ranunculaceae
Status	:	Herb

Medicinal uses

The root is used in uterine diseases, epilepsy and is blood purifier. The seeds are emetic and cathartic. The infusion of dried flowers is useful in diarrhea.

Botanical name	:	<i>Podophyllum hexandrum</i>
Local name	:	Banwaingan
Family	:	Berberidaceae
Status	:	Herb

Medicinal uses

The seed are demulcent, stimulant and nervine tonic. The oil is slightly laxative.

The cake left after extraction of the fixed oil is used in cases of diabetes. Burnt shell of almond is used as a tooth-powder.

Botanical name	:	<i>Polygonum aviculare</i>
Local name	:	Drop
Family	:	Polygonaceae
Status	:	Herb

Medicinal uses

It is expectorant, diuretic, tonic, astringent, antiseptic and antiperiodic. It is also given in diarrhea, soar-throat, lung diseases and whooping cough.

Botanical name :	<i>Rheum emodi</i>
Local name :	Revand-chini
Family :	Polygonaceae
Status :	Herb

Medicinal uses

The roots are purgative and astringent tonic. The tuber is pungent, bitter and diuretic, also used in sore-eyes, piles, chronic bronchitis, chronic fever, asthma, pains and bruises.

Botanical name	:	<i>Rumex hastatus</i>
Local name	:	Khetemel
Family	:	Polygonaceae
Status	:	Herb

Medicinal uses

Leaves of plant used for curing internal body wounds.

Botanical name	:	<i>Rumex nepalensis</i>
Local name	:	Hoola
Family	:	Polygonaceae
Status	:	Herb

Medicinal uses

Juice of plant is antiseptic used for healing wound. Leaves are laxative and used as vegetable.

Botanical name	:	<i>Saussurea lappa</i>
Local name	:	Postkhai
Family	:	Compositae
Status	:	Herb

Medicinal uses

Dried roots are aromatic, tonic, stomachic, carminative, stimulant and useful in asthma, cough, fever, chest problems and cholera. It is also used skin diseases and rheumatism. The root has been much priced as an aromatic substance.

Botanical name	:	<i>Bergenia ciliata</i>
Local name	:	Zakham-i-Hayat
Family	:	Saxifragaceae
Status	:	Herb

Medicinal uses:

The root is used as a tonic in fevers, diarrhea and cough. It is bruised and applied to boils and also used in ophthalmia.

Botanical name	:	<i>Skimmia laureola</i>
Local name	:	Barru, Ner
Family	:	Rutaceae
Status	:	Shrub

Medicinal uses

The leaves, when crushed, have an orange-like smell and are burnt near small pox patients with a view to curative effects and the smoke produced purifies the air.

Botanical name	:	<i>Solanum nigrum</i>
Local name	:	Mako
Family	:	Solanaceae
Status	:	Herb

Medicinal uses

The leaves are laxative. The berries are useful in diseases of heart and eyes.

Botanical name	:	<i>Swertia chirata</i>
Local name	:	Chirata
Family	:	Gentianaceae
Status	:	Herb

Medicinal uses

The plant is bitter, tonic, stomachic, laxative, febrifuge, anthelmintic, alterative and antiperiodic. It cures constipation and dyspepsia. The drug acts as an appetizer and improves digestion. It is very valuable in intermittent fevers, skin diseases, intestinal worms, and bronchial asthma.

Botanical name	:	<i>Thalictrum javanicum</i>
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Local name	:	Mamiri
Family	:	Ranunculaceae
Status	:	Herb

Medicinal uses

It is given as tonic, aperients and febrifuge. It is also useful in jaundice and flatulence.

Botanical name	:	<i>Thymus serpyllum</i>
Local name	:	Ban-ajwain
Family	:	Labiatae
Status	:	Herb

Medicinal uses

The herb is given in weak vision, fever, complaints of stomach and liver, suppression of urine and menstruation. The infusion of leaves is used in skin diseases and oil from leaves is applied to toothache.

Botanical name	:	<i>Urtica dioica</i>
Local name	:	Kaiari, Bichu
Family	:	Urticaceae
Status	:	Herb

Medicinal uses

The juice of the plant is used as an external irritant. The root is diuretic and poisonous.

Botanical name	:	<i>Viola odorata</i>
Local name	:	Banafsha
Family	:	Violaceae
Status	:	Herb

Medicinal uses

An infusion of the flower is used as a mild purgative. Externally the herb is used for eczema. Fresh leaves are used for the cure of cancer and relieve pain due to cancerous growths in the throat. The leaves are equally useful externally for the treatment of cancer affected parts. The flowers are a household remedy for the treatment of coughs, sore-throat, kidney and liver disorders.

Botanical name	:	<i>Withania somnifera</i>
Local name	:	Asgandh
Family	:	Solanaceae
Status	:	Shrub

Medicinal uses

The root is used as tonic and diuretic. The juice of the whole plant is useful in rheumatism. The bruised leaves and ground roots are used as a local application to painful swellings and ulcers. The leaves are bitter and are given in infusion in fever. The seeds are used for coagulating the milk.

CONCLUSION AND RECOMMENDATIONS

The flora of Leepa valley is very rich with tremendous diversity has a wide range importance. It should be conserved so that natural vegetation and important species flourish. The following steps may help to maintain the plant diversity of this area:

- Stopping all sorts of legal and illegal clear felling.
- Developing mixed plantation forest in disturbed area with local species only.
- Most spaced plantation to encourage the development of other tears of vegetation.
- Developing gardens-nurseries at different altitude to preserve and propagate rare and endangered plants.
- Farming should be prohibited in the reserve areas.
- Plant based industries should be established so that raw material can be collected from natural vegetation.

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