Importance of conservation of Cold Desert Medicinal Plants in Ladakh

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Introduction

- Ladakh; northern most part of India under J&K state comes under the cold desert regions of India. The snow capped mountains, low humidity, little rainfall, subzero temperatures, heavy influx of infra red and ultra violet radiation are some of the characteristic features of the cold desert regions.

- There is not even a single plant grows during winter months. The vegetative growth starts only from the month of April with the melting of snow, it is on its full bloom in the month of July August and starts disappearing by the end of September.

- Ladakh come under alpine and high alpine agro climatic zones with the domination of annual and perennial herbs followed by few bushes.

- These harsh and characteristic echo-climatic conditions have blessed trans Himalayan plants with high medicinal, aromatic and other useful properties.

- All the major medical traditions of Asia have been using Himalayan plants in there formulations but the indigenous Sowa-Rigpa system of Ladakh and other Himalayan regions is specially based on the skillful use of these plants.

TOPOGRAPHY

BARREN MOUNTAINS

FROZEN PANGONG LAKE

SNOW CLADDED MOUNTAINS

AN OASIS IN COLD DESERT

Herbal Wealth

- The trans-Himalayan region of Ladakh might look barren and lifeless at a first appearance, but it is home to around 1100 plant species with large numbers of plants with high medicinal and aromatic value.
- It is found during our study that around 525 plants species of Ladakh have medicinal uses in various Indian system of medicines, folk traditions and aromatic uses in India.
- Beside medicine, these plants have been also used by the indigenous people for fuel, fodder, food, incense and other socio-cultural events.
- The present growing demand for herbal products has also increased the demand for Himalayan herbs for cosmetic use, food & beverages and drug industry etc.
- The global annual trade in herbal products has been growing from last two decades rapidly and it is one of the fastest growing Industry.
- Till now the practitioners of Traditional Medicine and herbal industries are mostly dependent on the wild plant sources to fulfill their medicinal and commercial need.

VEGETATION

TEMPERATE VEGETATION

ALPINE MESOPHYTES

Pinus sp

Podophyllum hexandrum

OASITIC VEGETATION

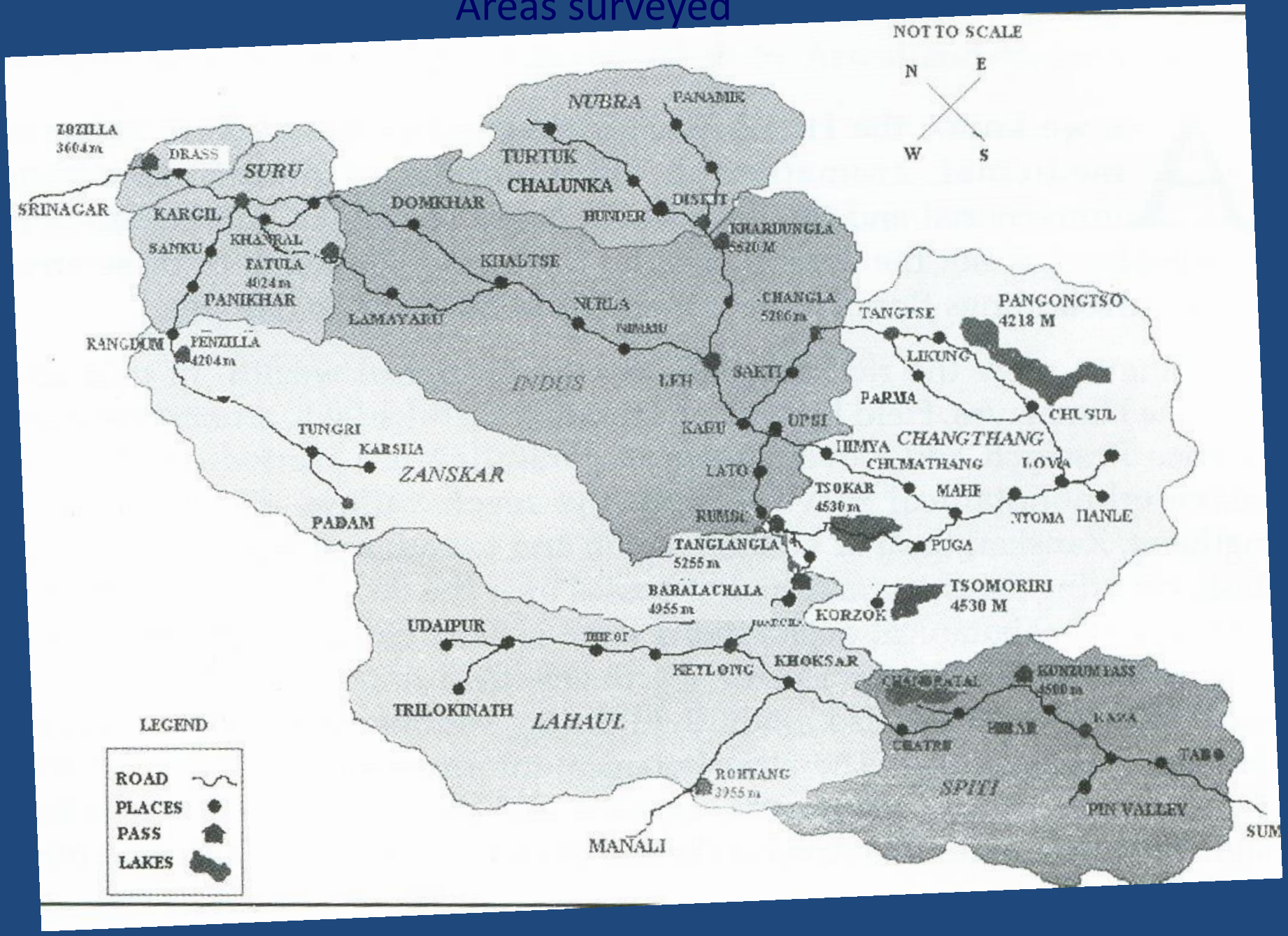
HIGH ALPINE VEGETATION

PLANT ADAPTATION

- High altitude plants exhibit a number of adaptations as under to counteract the impact of high altitude climate :
  - **Ecological adaptation**
  - **Morphological adaptation**
  - **Physiological adaptation**
  - **Reproductive strategies**

COLCHICUM LUTEUM
(COLCHICUM)

Areas surveyed



Matter of concern

- Due to above factors need and greed for Himalayan plant species have been increased tremendously.
- Over and unscientific exploitation, many plants species are being degraded, fragmented and even disappearing at an alarming rate.
- The recent changes in ecosystem and environment are another matter of great concern for survival of these species.
- It is observed during our surveys and studies that many of these plant species are rapidly degrading and crying for conservation.
- The CAMP workshop, organized in Himachal Pradesh by FRLHT, had also conformed the endangered status of few plants.
- While we may welcome the growth of traditional medical systems and herbal products.
- But it is very important to balance and reconcile these two trends for sustainable development of traditional medical system and herbal products.

The Kullu CAMP workshop assessed 42 plants:

S. no. Category	J& K	H P
1.Critically endangered (CR)	06	02
2.Endangered (EN)	11	11
3.Vulnerable (VU)	18	21
4.Low Risk near Threatened	02	02
5.Lower Risk Least concerned	02	02
6.Data deficient (DD)	01	01
7.Not evaluated (NE)	02	03

Need for mechanism to sustainable uses of medicinal plants for rural development

- **Till 1980s the trans- Himalayan plants were only used by the local people for their domestic needs and local Amchis for treating patients of their locality in sustainable manner.**

- **The inaccessible, remoteness and harsh climatic conditions have provided natural safety for these plants.**

- **With the expansion of roads and increased population have exposed these herbal wealth and brought new commercial interest.**

- **Therefore, it is very important to develop a mechanism for sustainable and coordinated exploitation of these wild plants which will provide ecologically sustainable, socially acceptable and economically equitable production and utilization system.**

- **This will required an appropriate participation and action from major stake holders like traditional medical practitioners, foresters, local community, Government and non Government organization, Researchers and Industries etc.**

Sowa-Rigpa and medicinal plants

- Sowa-Rigpa believes that there is no substance on this earth without medicinal property.
- Plants are the dominant substance for most formulations and more than 80% of medicines are plants based.
- Plants based medicines are considered very efficacious in potency and easily accessible in every far and remote place on the earth and can be utilized by every practitioner without any obstacle.
- Skillful use of Trans Himalayan medicinal plants is one of unique specialty of Sowa-Rigpa

ACONITUM HETEROPHYLLUM

Family : Ranunculaceae

Aconite / Atees / Bona karpo

Habit : A perennial herb with pale yellow flowers

Habitat : Alpine slopes

Elevation : 10,000-12,500 ft.

Source of drug ‘aconite’

Status : Endangered

Propagated through seeds

ACONITUM VIOLACEUM

Family : Ranunculaceae

Aconite / Patis / Bona nagpo

Habit : A perennial herb with dark blue flowers

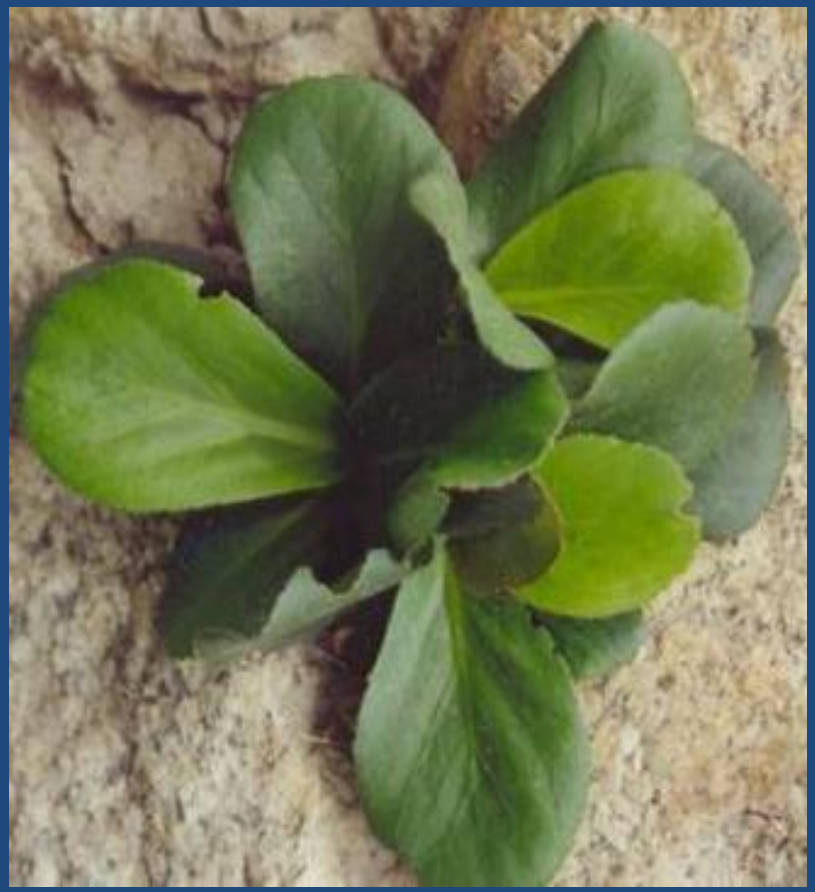
Habitat : Alpine slopes

Elevation : 12,000-14,500 ft.

Source of drug ‘aconite’

Status : Endangered

BERGENIA STRACHEYEI



Family : Bergeniaceae

Pasanbheda / Stod-li

Habit : A perennial herb with white flowers

Habitat : Alpine slopes

Elevation : 12,500-14,000 ft.

Uses : For kidney stones

Status : Endangered

COLCHICUM LUTEUM

Family : Liliaceae

Name : Stag-nu

Habit : A perennial herb with yellow flowers

Habitat : Alpine slopes

Elevation : 10,000-11,000 ft.

Uses : Against gout & source of colchicine

Status : Endangered

DACTYLORHIZA HATAGIREA

Family : Orchidaceae

Spotted Heart Orchid / Ambolakpa / Salam Panja

Habit : A perennial herb with blue flowers in spike

Habitat : Alpine moist areas

Elevation : 9,000-12,500 ft.

Roots used as health tonic.

Status : Endangered

EPHEDRA GERARDIANA

Family : Ephedraceae

Ephedra / Chai-pat

Habit : A much-branched perennial herb with small succulent fruits.

Elevation : 9,500-15,000 ft.

Source of a drug ‘ephedrine”

Status : Endangered

Propagated through seeds / suckers

FERULA JAESCHEANA

Family : Apiaceae

Name : Wild Hing/ tru-nag

Habit : A perennial herb with pale yellow flowers

Habitat : Alpine slopes

Elevation : 10,000-11,500 ft.

Uses : Useful against septic wounds and cuts

Status : Endangered

Propagated through seeds

HIPPOPHAE RHAMNOIDES ssp. TURKESTANICA

Family : Elaeagnaceae

Seabuckthorn / Star-bo

Habitat : Along river belts

Elevation : 9,500-12,500 ft.

Seabuckthorn juice, herbal tea & SBT oil capsules formulated and commercialized.

Status : Common

Hippophae salicifolia

Hippophae tibetana

INULA RACEMOSA

Family : Asteraceae

Puskarmool / Manu

Habit : A perennial herb with yellow flowers

Habitat : Alpine slopes

Elevation : 10,000-12,500 ft.

Roots used against asthma

Status : Endangered

Propagated through seeds / rhizomes

MECONOPSIS ACULEATA

Family : Papavareaceae

Blue poppy/ Achak-tsernon

Habit : A delicate perennial herb with blue flowers.

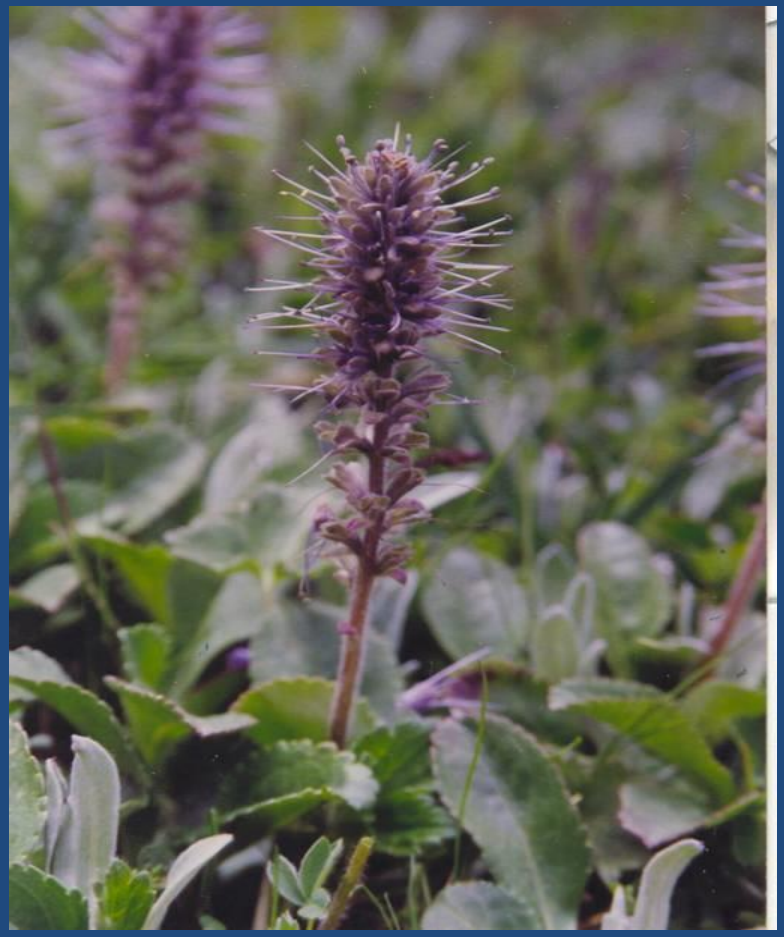
Habitat : High alpine zones, rock crevices

Elevation : 13,500– 15500 ft.

Roots are useful against spinal problems

Status : Endangered

PICRORHIZA KURROOA



Family : Scrophulariaceae

Picrorhiza / Hong-len / Kutki

Habitat : Alpine rocky slopes

Elevation : 13,000-14,500 ft.

Roots used in asthmatic disorders

Status : Endangered

PODOPHYLLUM HEXANDRUM

Family : Berberidaceae

May apple / Bankakri / Olmo-se

Habitat : Sub-alpine areas

Elevation : 10,000-12,500 ft.

Rhizomes used as anti-cancer & having radioprotection property

Status : Endangered

Propagated through seeds / rhizomes

RHEUM SPECIFORMAE

Family : Polygonaceae

Rhubarb / Rivandchini/ chu-tsa

Habitat : Moist places

Elevation : 13,500-14,500 ft.

Used as laxative

Status : Endangered

Propagated through seeds / rootstocks

RHEUM WEBBIANUM

Family : Polygonaceae

Rhubarb / Rivandchini/ lchum-tsa

Habitat : Moist places

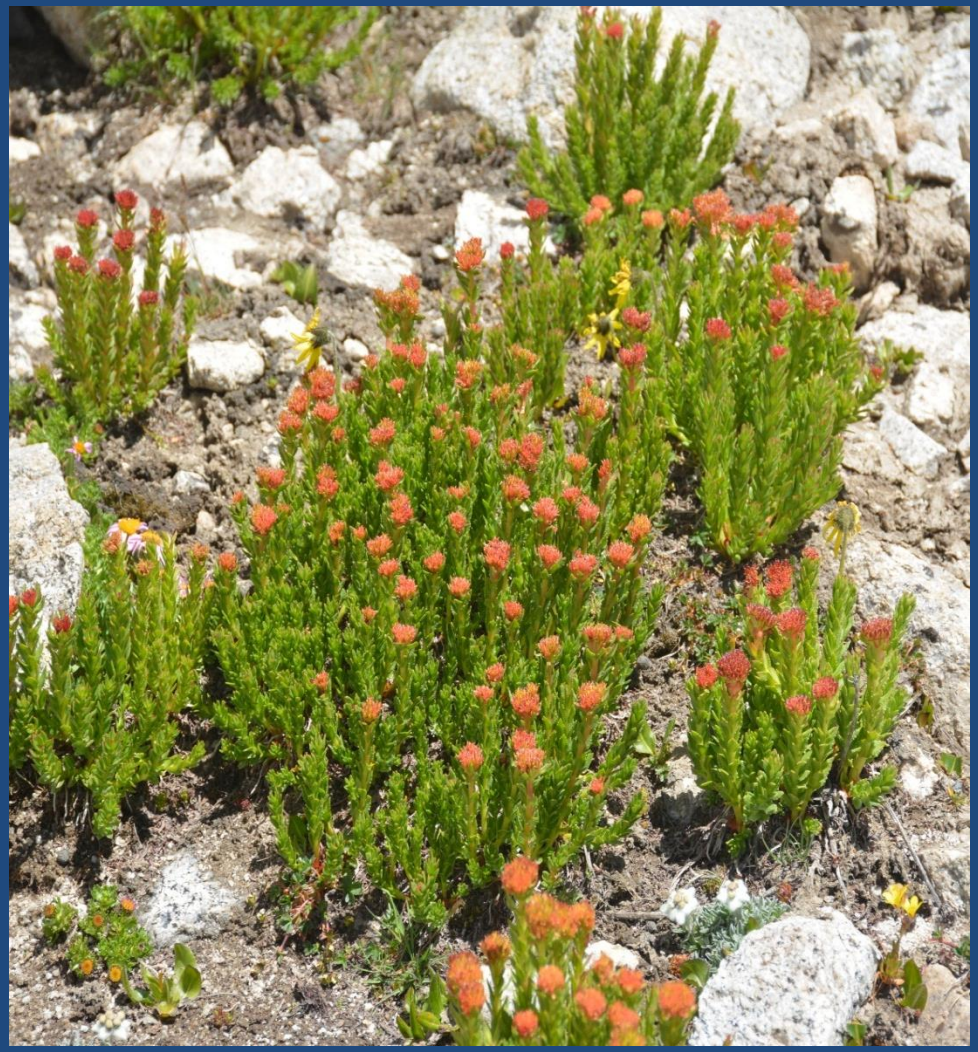
Elevation : 10,500-12000 ft.

Used as laxative

Status : Endangered

Propagated through seeds / rootstocks

RHODIOLA IMBRICATA



Family : Crassulaceae

Rose root / Shrolo-marpo

Habitat : Moist alpine places

Elevation : 15,500-18000 ft.

Used as antistress, antifatigue & restores memory.

Status : Rare

Propagated through rootstocks

SAUSSUREA LAPPA

Family : Asteraceae

Costus / Kuth / Ru-ta

Habit : A perennial herb with purple flowers

Habitat : Alpine slopes

Elevation : 10,000-12,500 ft.

Roots used against asthma and fever

Status : Endangered

Propagated through seeds / rhizomes

POTENTIAL MEDICINAL PLANTS OF TRANS HIMALAYA

- Inula racemosa (Pushkar mool / Manu
- Aconitum heterophyllum (Atees / Boakarpo)
- Arnebia euchroma (Rattanjot / Demok)
- Rheum webbianum (Revandchini / Lacchu)
- Saussurea Lappa (Ruta/ Kuth)
- Dactylorhiza hatagirea (wang-lag/ salam panja)
- Hippophae rhamnoides (ltar-bu/ seabuckthorn)
- Rhodiola (srolo-marpo)
- Picrorhiza kurrooa (honglen)

Conservation Issues of Medicinal Plants in the Region : Wild Collections

Collection for Use at Household Level

Collection for Use by Folk Practitioners

Collection for Commercial Purposes

Conservation Issues of Medicinal Plants in the Region : Diminishing Populations

Harvesting Pressure

Habitat Degradation & Loss

Conservation Issues of Medicinal Plants in the Region : Diminishing Populations

It is believed that availability of medicinal plants from the region is becoming scarce

- More time required to collect the required volumes
- Use of Substitutes/ adulterants becoming practice

Conservation Issues of Medicinal Plants in the Region : Assessing Threats

Conservation Assessment and Management Prioritisation (CAMP) Workshops

IUCN Categories and Criteria used for CAMP Workshops

Approaches to Conservation of Medicinal Plants

Ex situ : Botanical gardens, Germplasm banks, Cultivation

In situ : Conserve in natural habitats (MPCAs)

Approaches to Conservation of Medicinal Plants

Since all species are not amenable to commercial cultivation , *in situ* conservation remains the only feasible option for long-term conservation of 'threatened' medicinal plants of the region

CONSLUSION

Conservation of plant diversity is must to protect the existing genetic diversity, traditional medicines and plant wealth for sustainable exploitation of these valuable resources of trans Himalaya for its overall economic development and sustain the traditional knowledge.

“Save Plants and explore traditional knowledge for human welfare”

THANK YOU