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AN ETHNOBOTANICAL PROFILE ON COLD DESERT FLORA OF NUBRA VALLEY (LADAKH)

O. P. CHAURASIA AND BRAHMA SINGH

Field Research Laboratory (DRDO)

ABSTRACT

The paper covers 57 ethnobotanically important plant species of Nubra valley of Ladakh region. Brief information on their natural habitat and traditional uses has been furnished after survey of the areas.

INTRODUCTION

Ladakh, comprising Leh and Kargil districts, is the coldest and most elevated land in India with inhabited altitudes ranging from 8,500 ft to 18,380 ft. above mean sea level. The climatic conditions are a blend of arctic and desert climates with diurnal and seasonal fluctuation in temperature.

Ladakh lies between 32° - 36° N latitude and 76° - 79° E longitude. It has an area of 96,701 sq. km with a population of approximately 160 thousand people. Physiographically the entire Ladakh can be divided into five valleys - Indus, Nubra, Changthang, Suru and Zanskar valley.

Nubra valley of Ladakh is approached from Leh city through Khardungla (18,380 ft). Khardungla, the world's highest motarable pass is the gateway of Nubra valley. Because of difficult approach, the valley remains cut off during winter from rest of the world. Siachen glacier is very close to this valley. Nubra and Shyok are the two important rivers of the valley. The important places of this valley are Khardung, Khalsar, Hunder, Diskit, Partapur, Thoise, Chalunka, Turtuk, Panamic and Siachen glacier. Major concentration of population is on the confluence of Nubra and Shyok river.

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In fact, Nubra means valley of garden. Organized orchards of Apple and Apricot are now being established in Nubra valley. Like other valleys of Ladakh, barley, wheat, peas, potato, onion and mustard are the major crops. Vegetable production – cauliflower, cabbage, knoll khol, tomato, radish, carrot and leafy vegetables, is picking up for domestic consumption as well as for supply to the defence forces. The beauty and simplicity of valley inhabitants, their contentment and hospitability make indelible impression on the visitors.

COLD DESERT FLORA

Plant species of cold desert zone are mostly xerophytes followed by mesophytes. The flora is dominated by wild annual and perennial herbs followed by a few dwarf bushes or shrubs. The vegetative growth starts with the onset of summer. The melting snow provides abundant moisture to the plants to run their full course of development with great rapidity. The mountain slopes, alpine meadows, moraines and pasture lands give a spectacular display of varieties of flowers in otherwise barren mountains during July and August. The remarkable feature of this zone is continuous and successive changes in the floristic pattern during growth period.

After melting of snow and onset of summer the cruciferous plants, such as Draba, Christolea, Arabis are the first to bloom followed by species of CORYDALIS, PRIMULA, SAXIFRAGA and many others. The late summer (Aug.-Sept.) of this zone is dominated by Asteraceous taxa such as SAUSSUREA, ANAPHALIS, LEONTOPODIUM, JURINEA and WALDHEIMIA.

METHODOLOGY

Several ethnobotanical trips to Nubra valley covering roadsides and far-flung areas were made since 1993 between June to September with a view to collect cold desert plants and to get ethnobotanical information about them. Ethnobotanical inforamation regarding various uses of the flora of this valley have been gathered from different available sources, like villagers, local senior citizens and Amchis (Herbal doctor).

OBSERVATIONS

The observations made during the field surveys have been enumerated under following headings. The useful plants mentioned in the present paper have been described in alphabetical order with their botanical/local name, family, notes, place of collection and uses abbreviated as below :

a) Edible Plants (EP)
b) Fodder Plants (Fod)
c) House and house-holds (HH)
d) Magico-religious belief (MRF)
e) Medicinal Plants (MP)

ENUMERATION

Aconitum violaceum Jacq. ex Stapf

(Yangtso/Buma-nagpo)

Ranunculaceae

A perennial herb with tuberous roots and dark blue flowers in dense spike.

Growing along moist places: Chalunka. 9,600 ft.

MP : The dried roots are boiled and used in small doses to cure cough.

Allium carolinianum DC.

(Skotche)

Amaryllidaceae

A small bulbous herb with purple umbel.

Found along Chalunka village, 9,600 ft.

EP : Tender leaves are used as flavouring agent.

A. loratum Baker

(Skotche)

Amaryllidaceae

A small bulbous perennial herb with white umbellate flowers.

Common on rocky places; Hunderduck village, 12,500 ft.

EP : Same as in case of *Allium carolinianum.*

Amaranthus spinosus Willd.

(Chaulai)

Amaranthaceae

A thorny herb up to 30-60 cm high.

A common weed of cultivated fields and on moist places; Chalunka village, 9,600 ft.

EP : Tender shoots and leaves are used as vegetable. Young leaves may be dried and stored for winter use.

MRB : Seeds are considered pious and used during various occasions.

Anaphalis cuneifolia Hook. f.

(Simula)

Asteraceae

A small perennial herb with corymbose flower-heads.

Found along rocky places; Hunderduck village, 12,500 ft.

MP : Plant juice is used to treat skin complaints.

Androsace mucronifolia Watt

(Simpu)

Primulaceae

A rather lax or dense cushion or mat forming plant.

Seen on the open alpine slopes; North Pullu, 15,000 ft.

MP : An infusion of the plant is used to cure abdominal pain.

Arnebia euchroma (Royle ex Benth.) Johnston

(Demok)

Boraginaceae

A tufted bristly haired perennial with stout rootstock.

Common on rocky slopes; near Khardung village, 13,500 ft.

EP : The root yields a red edible dye which is used for colouring sweets in Budhists' temples.

HH : The dye is also used as cosmetic (lipstick) by the locals.

Artemisia dracunculus Linn.

(Burtse)

Asteraceae

An erect, strongly aromatic perennial herb with glandular flower-heads.

Common in waste places; Panamic village, 10,500 ft.

MP : The plant extract is used as diuretic and to regulate menstrual cycle. It also relieves toothache.

HH : Dried plants are used for making kacha roof. Plants are also used as insect repellent.

A. gmelinii Web ex Stechm.

(Khampa Shridi)

Asteraceae

An erect, strongly aromatic perennial plant with green flowers in spike.

Common on dry slopes; Khardung village, 13,500 ft.

MP : Leaf decoction is useful to cure cold and cough.

HH : Dried plants are used for making roof.

Astragalus confertus Benth. Ex Bunge

(Singyalo)

Fabaceae

An erect perennial plant with stalked pod.

Found growing in cultivated fields; Hunderduck village, 12,250 ft.

Fod : Used as fodder.

A. hoffmeisteri (Klotz.) Ali

(Lekhman)

Fabaceae

A glabrous perennial plant with peduncled flowers.

Rare on stony slopes; towards Chalunka village, 9,600 ft.

Fod : Used as fodder.

Berberis ulicina Hook. f. & Thoms.

(Singtic)

Berberidaceae

A much-branched shrub with ovoid black fruits.

Common along the river on sandy areas; Partapur, 10,250 ft.

MP : Roots and bark are source of a tonic.

HH : Fruits are used for dying clothes. Plants are also used as biofence.

Berberius zabeliana subsp. **pachyacantha** Schnied.

(Sincorpa)

Berberidaceae

A stiff, stout-stemmed shrub with ovoid red berries.

Along sandy belts; near Chalunka village, 9,600 ft.

MP : The decoction of roots is used by the locals in fever.

HH : Plants are also used as biofence.

Campanula cashmeriana Royle

(Phophoso)

Campanulaceae

An attractive, perennial herb with bright, blue flowers.

Rare on higher passes; on way to Hunderduck village, 12,500 ft.

HH : Used by the locals for ornamental purposes.

Caragana versicolor (Wallich) Benth.

(Trama)

Fabaceae

A low, densely branched, spiny shrub with yellow flowers.

Common in sandy places; Panamik village, 10,500 ft.

HH : Major fuel plant of the area.

Chenopodium album Linn.

(Sneu)

Chenopodiaceae

Annual as well as perennial herb with branched or unbranched stem.

Common in cultivated field; Partapur, 10,250 ft.

MP : The paste of the plant is applied on wounds and sores of cattle.

Fod : Considered as good fodder. The tender leaves are cooked as vegetables.

Colutea multiflora Stepf ex Ali

(Pingtik)

Fabaceae

A spineless, deciduous shrub with ellipsoid beaked pod.

Rare on stony slopes; Chalunka village, 9,600 ft.

HH : Inflated pods are used for decoration in local houses. Also used as fuel.

Corydalis rutifolia (Smith) DC.

(Chimlo)

Papaveraceae

A small, delicate, perennial herb with pink to purple flower.

Along roadside; Panamik village, 10,500 ft.

MP : An extract of the plant is used locally to cure skin diseases.

Cuscuta approximata Babington

(Amarlata)

Cuscutaceae

A leafless, twining, parastic herb.

Around waste places; Hunderduck village, 12,500 ft.

MP : A paste of the plant is applied to cure warts.

Dactylorhiza hatagirea (D. Don.) Soo

(*Orchis latifolia* auct. non. Linn.)

(Sanchu/Angmolapa)

Orchidaceae

A tuberous, perennial herb with purple flowers in dense spike.

Common along damp places; Partapur, 10,250 ft.

MP : Roots and flowers are used in kindly problems.

HH : As ornamental.

MRB : Considered as religious flowers in Budhists' temples.

Elaeagnus angustifolia Linn.

(Shersing)

A medium size tree with small fragrant flowers.

Usually planted in kitchen garden by the locals.

HH : As fuel and ornamental.

MRB : Considered as pious in Budhists' temples.

Elytrigia repens (L.) Nevski

(Zamak)

Poaceae

A tufted perennial grass up to 80 cm tall.

Growing in cultivated fields, Partapur, 10,250 ft.

Fod : Considered as good fodder.

MP : Fresh leaves of grass along with gram are rubbed on the tongue in foot and mouth disease (FMD) of cattle.

Ephedra gerardiana Wallich ex Stapf.

(Chhapat)

Ephedraceae

A prostrate shrub with red, fleshy fruits.

Common on stony slopes, gravel terraces and in dry areas; Hemis village, 11,600 ft.

MP : Yields a drug 'Ephedrine' which is nerve stimulant. Supposed to be good for health for the livestock.

Fod : Dried twigs are browsed by goats and sheep.

Epilobium angustifolium Linn.

(Gogon)

Onagraceae

An erect, leafy, perennial herb with rose-purple flowers.

Growing in moist places; Panamik village, 10,500 ft.

HH : Used locally as ornamental.

Fagopyrum tataricum (Linn.) Gaertn.

(*Polygonum tataricum* Linn.)

(Dyat)

Polygonaceae

An annual, glabrous herb with flowers in terminal clusters.

Common in wheat fields; Chalunka village, 9,600 ft.

EP : Young leaves are cooked as fresh or dehydrated for use in winter.

Gentiana carinata Griseb.

(Shekor)

Gentianaceae

A small, tufted, annual herb with dark blue flowers in cluster.

In moist places along higher passes; North Pullu, 15,500 ft.

MP : The whole plant is used against stomach complaints.

Geranium sibiricum Linn.

(Eyamlomentok)

Geraniaceae

A perennial, prostrate herb with paired flowers.

Common in sandy places; Chalunka village, 9,600 ft.

MP : A decoction of the plant is used to cure diarrhoea.

Heracleum pinnatum Clarke

(Zimtso)

Apiaceae

A tall perennial plant with white umbellate flowers.

Found growing on mountain slopes; Khalsar village 11,500 ft.

Fod : Used as fodder.

HH : Dried plants are used as fuel and also for making broom.

MP : Quite useful for early lactation in cattle.

Herminium monorchis (Linn.) R. Br.

(Suchumentok)

Orchidaceae

A tuberous, slender herb with yellow-green flowers.

Found growing on moist places; Hunder village, 10,250 ft.

MP : A paste of the bulb is useful in kidney problems.

Hippophae rhamnoides Linn. ssp. **turkestanica** Rousi

(Shermang)

Elaeagnaceae

A dwarf, much branched, thorny shrub with orange-red fleshy fruits.

Common along Nubra river and waste lands in the valley.

MP : To rugulate menstrual cycle.

EP : Fruits are rich source of vit 'C', and are utilized for making jam, juice, etc.

HH : Considered as excellent fuel. Also used as biofence.

Fod : Used as fodder.

Hymenolobus procumbens (L.) Nutt. Ex Torry & Gary

(Samsho)

Brassicaceae

A small, annual, glabrous herb with small, white flowers.

Cultivated in fields; Diskit village, 10,500 ft.

EP : The tender leaves are cooked as vegetables.

Inula rhizocephala Shrenk var. **rhizocephaloides** (Clarke) Kitam.

(Riamka)

Asteraceae

A small prostrate herb with yellow flower-head.

Rare along moist places; North Pullu, 15,500 ft.

MP : Roots are used against cold and cough.

Iris lactea Pallas

(Teshmamentok)

Indiaceae

A perennial herb with stout rootstock and lilac flowers.

Common along moist places; Diskit village. 10,500 ft.

Fod : Considered as good fodder.

MP : To increase quantity of milk.

HH : Attractive flowers are used for decoration.

Juniperus communis Linn.

(Shupa)

Cupressaceae

A low growing shrub with globose, blue-black cones.

Found growing in drier areas; Chalunka, 9,600 ft.

MRB : Considered as pious in Budhist temples and used for incense.

HH : As fuel.

Lepidium latifolium Linn.

(Sangso)

Brassicaceae

A tall, erect, branched perennial with white flowers.

Common on waste places; Diskit village, 10,500 ft.

EP : The tender leaves are cooked as vegetable.

Fod : Leaves are used as fodder.

HH : Dried plants are used for making brooms.

Lindelofia stylosa (Kar. & Kir.) Brand.

(Makpen)

Boraginaceae

An erect, perennial herb with purple flowers.

Grown in large clumps; near Khargung, 13,500 ft.

Fod : Used as fodder.

HH : Flowers are used by the locals for decoction.

Medicago falcata Linn.

M. media Pers.

M. sativa Linn.

(Ole)

Fabaceae

A perennial herb.

Found in cultivated or wild form.

Fod : Main fodder crop of Ladakh region.

EP : Leaves are sometimes cooked as vegetables.

Morus alba Linn.

(Goon)

Moraceae

A large fruit tree.

Found in cultivated or wild form.

EP : Fruits are usually consumed as raw.

Fod : Leaves are used as fodder.

HH : Timber is used for house construction and other items.

Myricaria germanica (Linn.) Desv.

(Umbo)

Tamaricaceae

An erect shrub with reddish flowers in clusters.

Common along Shyok river, Sumur village, 10,300 ft.

Fod : Used as fodder.

HH : Dried twigs are used for fuel.

Nepeta discolor Royle ex Benth.

(Nyomala)

Lamiaceae

A low, spreading, perennial plant with white-purple flowers in spike.

Growing on alpine rocky slopes; Chalunka village, 6,600 ft.

MP : Leaf decoction is used in cold and cough.

HH : Used as insect repellent.

Nepeta glutinosa Benth.

(Gimalanko)

Lamiáceae

An erect, aromatic, perennial plant with violet flowers in spike.

Common on stony slopes; Chalunka village, 9,600 ft.

MP : Decoction of the plant is used against diarrhoea.

Oxytropis cachemirica Cambess.

(Yamchu)

Fabaceae

A herbaceous perennial with rose-red flowers in globular head.

On rocky slopes; Tegar village, 10,300 ft.

Fod : Used as fodder.

Pedicularis pycnantha Boiss.

(Sucantso)

Scrophulariaceae

An erect, unbranched, glabrous perennial herb with pink flowers in dense spike.

Found along moist places; Panamik village, 10,500 ft.

HH : As ornamental.

Populus nigra Linn.

(Yulat)

Salicaceae

A tall tree with columnar form and upright branches.

A common forest tree species of the valley.

HH : Timber is used for house construction and waste parts are used for fuel.

Prunus armeniaca Linn.

(Chuli)

Rosaceae

A medium sized tree with yellow-orange juicy fruits.

Common fruit tree of the valley.

EP : Main fruit crop used as fresh and in dehydrated form. Oil extracted from seeds is used for massage.

HH : Dried parts are used as fuel.

Rhodiola heterodonta (Hook. f. & Thoms.) A. Bor.

(Shrolo)

Crassulaceae

A succulent, perennial herb with red flowers in cluster.

Common at high alpine passes, North Pullu, 15,000 ft.

EP : Tender shoots are cooked as vegetable.

MP : It has got medicinal value also.

Fod : Grazed by animals.

HH : As ornamental by the locals.

Rosa webbiana Wallich. ex Royle

(Siah)

Rosaceae

A leaf shedding shrub with pink flowers.

Common in dry places, Khalsar village, 11,500 ft.

EP : Fruits are edible and contain vit 'C'

HH : Used as ornamental purposes. Dried branches are used for making walking sticks and for other items.

MRB : Flowers are considered as pious and are used in Budhist temples.

Rumex hastatus D. Don.

(Gungantse)

Polygonaceae

A perennial herb with flowers in small whorls.

Found in dry location; Nimmu, 10,500 ft.

EP : Young shoots are cooked.

Salix angustifolia Willd.

(Mulchang)

Salicaceae

A medium sized tree with smooth branches.

Common in the valley.

HH : Branches are used for making roof. Waste parts are used as fuel.

Saussurea certocarpa Decne var. **depressa** (Clarke ex Hook. f.) Lipsch.

(Simno)

Asteraceae

An erect, branched, leafy perennial.

Found in sandy areas; Sumur village, 10,300 ft.

MP : Leaf paste is sometimes used to cure wounds.

Saxifraga oppositifolia Linn.

(Sasmantso)

Saxifragaceae

A small, erect, perennial herb with purple flowers in terminal clusters.

Found growing on higher passes; North Pullu, 15,500 ft.

MP : The plant is used as tonic.

Sophora moorcroftiana Benth. ex Baker

(Singtic)

Fabaceae

A much branched spiny shrub with blue flowers in axillary clusters.

Common in sandy and waste places; Tegar village, 10,300 ft.

MP : Seeds have got medicinal value.

HH : Used as fuel.

MRB : Seeds have got magico-religious belief.

Tamarix ramosissima Ledeb.

(Agrelta)

An erect, branched shrub with small flowers in dense terminal spikes.

Along riverbed and sandy areas; Tegar village, 10,300 ft.

HH : Used for fuel.

Taraxacum officinale Weber.

(Han)

Asteraceae

A scapigerous herb with yellow flower-head on a long stalk.

Prominent along the water stream, Partapur village, 10,250 ft.

MP : Dried root is used as tonic and diuretic.

EP : Leaves are cooked as vegetable.

Ulmus wallichiana Planchon

(Umbok)

Ulmaceae

A large tree with rough very bark and winged fruits.

Found growing in Tegar village, 10,300 ft.

MP : Barks are used in joint pains.

Fod : Leaves are used as fodder.

HH : Considered as an excellent fuel. Bark is used locally as shampoo.

MRB : Considered as religious plant.

CONCLUSION

The present work is maiden attempt to explore and document the ethnobotanical

wealth of Nubra valley. In this investigation 57 traditionally important plant species have been documented in brief. During exploration it has been observed that these taxa have been extensively used by the local people for various purposes in their day to day life.

The main thrust of the current research includes exploration and documentation of under-exploited plants used in tribal societies and which can yield raw materials vitally needed in medicine, agriculture and industry.

Due to invasion of non-tribals in tribal areas, the people have abandoned the traditional use of plants in their day to day life and majority of important plants are becoming rare owing to over-exploitation and other biotic factors. Therefore, the work of ethnobotanists is of prime importance in ensuring that the ethnobotanical knowledge of tribal people is not lost for all the time. Tribal societies needed special attention as the forces of economic development disrupt their traditional lifestyles. The protection of ethnobotanical wealth becomes important for any development plan in tribal areas.

Therefore, an integrated programme of ethnobotanical and agronomical research and documentation would require closer collaboration between botanists, agronomists, anthropologists, linguists, plant chemists, pharmacologists and allied specialists which could lead to a better understanding of the interrelations of primitive societies and surrounding flora.

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