

Ethnobotanical Studies of Chikar and its Allied Areas of District Muzaffarabad

Imtiaz Ahmad Saghir, Ashfaq Ahmad Awan, Syed Majid,

¹Mir Ajab Khan, ¹Sohail Jamil Qureshi and ¹Sofia Bano

Department of Botany University of Azad Jammu & Kashmir, Pakistan

¹Department of Biological Sciences, Quaid-i-Azam University Islamabad, Pakistan

Abstract: During ethnobotanical investigations in Chikar and allied areas of Muzaffarabad a total of 53 plant species belonging to 48 genera of 33 families were recorded. Most of the plant species are used as medicinal plants for the ailment of various diseases while some wild plant species are used as fuelwood, timber, fruit, fodder and vegetables. Some of the most interesting and representative plants of the area are *Adhatoda zeylanica* which is mainly used for cough, bronchitis, stomachache and dysentery. *Arisaema jacquomontii* is poisonous plant. Extract of the leaves of *Viburnum cotinifolium* is administered in menorrhagia and the fruit is laxative and blood purifier.

Key words: Ethnobotany, Chikar, Muzaffarabad, plant resources, medicinal plants

Introduction

Chikar is a town of Tehsil Hattian Bala and situated at a distance of 16 km from Muzaffarabad, at an elevation of 1828 meters. It is located in the south of Muzaffarabad River Jhelum flows in north of the town. East of Chikar Chkothi sector, in the west Kohala while District Bagh is in south. The area falls in Jhelum valley, which is formed by the river Jehlum which oozes from "Chashma Verinag" in occupied Kashmir. The outstanding features of this beautiful place are its healthy climate and picturesque surroundings. The investigated area includes Haitian Bala, Chinari, Sari, Bani Hafiz, Nato village, Surbagla village, Orni, Kyyari village, Chatter Klaus and Danna. Summer is pleasant while winter is severe June and July are the hottest months of the year while December and January are coldest months. Maximum mean temperature is 36.5 °C and minimum temperature is 16.7 °C (Table 1).

Table 1: Temperature variation and average rainfall from 1988 to 1996

Year	Maximum temperature °C	Minimum temperature °C	Station Ghari doppatta (mm)
1996	28.5	16.7	1530.2
1995	36.5	20.1	1739.6
1994	29.6	19.8	1412.0
1993	34.4	19.8	1530.2
1992	32.4	17.2	1916.1
1991	32.1	18.6	1440.2
1990	34.0	19.3	1684.1
1989	32.7	21.1	1553.7
1988	85.8	21.1	----

Table 2: Average monthly humidity

Month	8 am	5 pm
January	8	-
February	20.5	-
March	81.5	-
April	61.5	68
May	57.5	62
June	53	66.5
July	80	86.5
August	80.5	88
September	65.5	73.5
October	65.5	-
November	78.5	-
December	77.5	-

Table 3: Soil analysis of different areas of Muzaffarabad

Properties of soil	Localities			
	Chikar	Chinari	Hattian	Danna
Saturation (%)	27	31	31	28
Soil texture	Sandy loam	Loam	Loam	Sandy loam
Soil pH	6.80	6.70	4.46	5.30
Organic matter (%)	2.15	1.56	2.13	2.10
Extractable (P) ppm	9.96	5.82	7.90	8.50
Extractable (K) ppm	73.20	22.25	30.50	75.20

It occurs mostly in the form of rainfall, snow fall, dew and hails. The area is showered by winter rains and as well as by monsoon rains. Average annual rainfall of the area from 1989 to 1996 (Table 1).

Snowfall occurs in winter season on high altitude in the month of November to March. Snowfall ranges from 1 foot to 40 feet. Some times precipitation occurs in the form of hails, which causes damage to the crops and fruits of area. In the cold and frost nights the area also receives precipitation in the form of dewdrops. The relative humidity is higher in cloudy days. It is lower during day time and higher at night (Table 2). Major stream in the area is River Jhelum oozes out from "Chashma Verinag" situated in the Indian held Kashmir. The area is characterized by rugged topography. Rocks are of sedimentary type of Precambrian age, no plain is in its fate except some terraces. Main types of rocks of the area are shale and sandstone (Baig, 2000). Soil samples were taken from Chikar and its allied areas. Samples were analyzed by the Agriculture Department Muzaffarabad. Soil is mostly loamy and sandy loam. Soil pH ranges from 4.46 to 6.80, organic matter 1.56 to 2.15 %, saturation 27 to 31 %, extractable phosphorus 5.82 to 9.96 ppm and extractable K 22.25 to 75.20 ppm (Table 3).

Ethnobotany of the area: Study of nature is called science. Plant science is concerned with the history, commerce, collection, selection, identification and preservation of the plants. Plants always had a great historical impact on the human civilization. Disease decay and death have always coexisted with the life. The study of diseases and their treatment must have been contemporaneous with the human. Ethnobotany is new field of research also applies its results on conservation and community development. Local natural history becomes a living, where it has been transmitted orally from many years. Local people of Chikar and its allied areas have always used medicinal plants for various ailments and

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had a long time been dependent upon plant resources for their food shelter, health fuel and other purposes.

Today ethnobotany is widely accepted as a science of humans interactions with plants and ecosystem. Ethnobotany is a multi disciplinary science of botany, ecology and anthropology. The fundamental structure of ethnobotanical research is to examine the relationship between human populations and cultural values. The survey of Chikar and its allied areas revealed that area is floristically rich. The local names are given in Pahari.

Shinwari and Khan (1997) describe the results of ethnobotanical investigation conducted in Margalla Hills National Park. The survey was aimed to enlist the fuel wood species and to assess their rate of consumption, availability and threats facing by the park authorities. A total of 35 species belonging to 29 genera and 24 families of wild trees and shrubs, were found to be commonly used as fuel wood in Margalla Hills National Park by the people.

Qureshi *et al.* (1997) studied the ethnobotanical uses of *Adhatoda vesica* Nees in chest diseases. The uses of *Adhatoda vesica* by tribals and rural people as herbal medicine for most of chest diseases as cough, bronchitis and asthma. Ahmad (1997) described the distribution, morphology and medicinal uses of *Taxus baccata* L. and he describes various medicinal uses as extract of plant is insecticide leaves and fruits are sedative and antispasmodic.

Gupta *et al.*, (1997) reported important folk medicinal plants and traditional knowledge of tribals of Aurangabsad and Nasik Forrest divisions of Maharashtra (India). The study deals with relation of folk medicinal plants and traditional knowledge of tribals for the welfare of the mankind and medicare. They reported 2000 plant specimens of medicinal importance for the cure of different diseases.

Rashid *et al.* (1997) described potential threats involved in the decline of some medicinal plants of Margalla Hills, Islamabad they studied in order to find out potential threats to these plants and their diversity was noted. It was observed that *Carissa opaca* Stap. f Ex. Hains and *Dodonaea viscosa* (L.) Jacq were the major species exploited as fire wood and grazing material. Fire was monitored the most perilous one, involved in decline of these species. Cutting and grazing are major problems faced by the medicinal plants of Margalla Hills, Islamabad.

Qureshi *et al.* (1997) reported checklist of the Gymnosperms of Chitral District, NWFP, Pakistan and their ethnobotany. They listed seven genera and fifteen species belonging to four families. Two species are identified as tea / coffee substitute, one has edible five as timber yielding and nine species are reported as medicinal. Singh *et al.* (1997) studied folk medicinal plants of Garhwal and Kumaon forests of Utter Pradesh India. They got information on new folk medicinal uses of 96 plants species belonging to 93 genera and 59 families. The data were collected either from local healers, or from the reliable old villagers during the course of ethnobotanical exploration of various forests and rural areas.

Gorge (1997) describes anthelmintic activity of some medicinal plants. He reported that helminthic infections are now being recognized as cause of much chronic ill health and sluggishness among the tropical people. More than half of the population suffers from worm infections. Traditional system of medicine reports the efficacy of several plant products for eliminating helminthes. Saleem *et al.* (1998) reported chemistry of the medicinal plants of genus *Acacia*. They collected the data about 11 species of this genus and describe the medicinal importance of the different part of the different

species such as bark, root, stem, flower, leaves, and their medicinal importance in the treatment of various diseases.

Ali *et al.* (1998) reported some medicinally important plants and described various parts of different species, which are effective in cure of different diseases such as asthma, cough, lungs, disorders, whooping cough, chronic bronchitis. Hamid *et al.* (1998) reported the medicinal plants of family Cannabinaceae. They reported that in Pakistan this family has 2 genera. Each having a single species which are of narcotic and sedative effects.

Shinwari and Khan (1999) reported folk uses of medicinal herbs of Margalla Hills National Park, Islamabad and he describe that the inhabitants of the park use medicinal plants for various ailments and are dependent on plant sources for food, shelter and fodder, health care and other cultural purposes. They recorded 50 species of herbs belonging to 27 families were recorded as medicinally by inhabitants of park.

Materials and Methods

During the field work, trips were arranged during proper harvest time of the plants collected and information about their use is collected from inhabitants of the area. Interviews were taken and observations were made during guided and transect walks. To eliminate any chance of error in identification, the specimens are collected in flowering and fruiting condition. Plant specimens were preserved and identified in the herbarium of Quaid-I-Azam University, Islamabad, Pakistan. Interviews of about ~150 informants including local inhabitants, herbalists, pansaries and societies were conducted on random basis. The results were rechecked and compared with already provided literature. Analysis of the data was done and indigenous knowledge was documented.

Results

During ethnobotanical investigations in Chikar and allied areas of Muzaffarabad a total of 53 plant species belonging to 48 genera of 33 families were recorded. Most of the plant species are used as medicinal plants for the ailment of various diseases while some wild plant species are used as fuelwood, timber, fruit, fodder and vegetables. The results obtained are given below:

Acanthaceae

Botanical name: *Adhatoda zeylonica* Medic.

Local name: Baiker

Occurance: Danna, Chatter Klaus, Hattian Bala

Status: Shrub

Folk medicinal uses: Roots and leaves are used for cough, bronchitis used in desentry. Leaves are also used for stomachache joints and eruption used in dysentery, especially in case of cattle's. Leaves buds are used in diabetes.

Botanical name: *Strobilanthes attenuata* Nees

Local name: Ban Till

Occurance: Danna, Chinari

Status: Herb

Folk medicinal uses: Leaves are chewed for toothache and Jawswelling. Dried powder is applied against Pus and Apostema.

Amaranthaceae

Botanical Name: *Amaranthus viridis* L.

Local name: Gunnyar

Occurance: Chikar, Bani Hafiz, Danna

Status: Herb

Folk medicinal uses: The plants used as anthelmintic. Also used for piles.

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Anacardiaceae

Botanical name: *Rhus cotinus* L.

Local name: Bahan

Occurance: Danna

Status: Shrub

Folk medicinal uses: Extract is antiallergenic (relieves allergy), antiparasitic (kills parasites) and antipyretic (relieves fever).

Apocynaceae

Botanical name: *Carissa opaca* Stap fexHaines

Local name: Grunda

Occurance: Danna, Chatter Klaus, Chinari

Status: Shrub

Folk medicinal uses: Fruit and leaves are cardiac, stimulants. Leaf decoction is used for asthma.

Botanical name: *Nerium oleander* L.

Local name: Kneer/Gundera

Occurance: Danna, Chinari, Chatter Klaus

Status: Shrub

Folk medicinal uses: Bark is used in skin diseases, rootpaste is scorpion sting and snake bite.

Araceae

Botanical name: *Arisaema jacquomontii* Blume

Local name: Aeend/Sergunda

Occurance: Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Plant is considered as poison.

Asclepidaceae

Botanical name: *Calotropis procera* (Willd) R. Br.

Local name: Ak

Occurance: Danna, Chatter Klaus

Status: Herb

Folk medicinal uses: roots and bark are used as tonic, antispasmodic, expectorant and emetic. Fresh leaves are roasted in the Ghee or oil and are applied on the swelling parts of body.

Asteraceae

Botanical name: *Achillea millefolium* L.

Local name: Sultani Booti

Occurance: Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Herb is diaphoretic, stimulant and chewed for toothache. The leaves, stem and floral parts are crushed, mixed with sugar and water and are taken in the case of fever, chest burn and for blood purification.

Botanical name: *Anaphalis nepalensis* (Spereng) Hand

Local name: Chahal

Occurance: Chianari, Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Aqueous extract is applied over joints against heatstroke at high temperature.

Botanical name: *Anaphalis timinue* Buck

Local name: Doody Jurree

Occurance: Chianari, Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Root powder is applied for joining the fractured bones. It relieves the pus from tumor.

Botanical name: *Erigeron alpinum* L.

Local name: Pir Gundal

Occurance: Kayyari, Chikar

Status: Herb

Folk medicinal uses: Tea is prepared from dried root powder,

which is calmative and antiphlogistic (relieves fever).

Botanical name: *Helianthus annuus* L.

Local name: Soojo

Occurance: Chikar, Danna

Status: Herb

Folk medicinal uses: Flower is crushed mixed with oil and is applied in skin diseases and itching. Seeds are diuretic and expectorant.

Botanical name: *Senecio chrysanthemoides* D. C.

Local name: Chahal

Occurance: Kayyari, Nato

Status: Herb

Folk medicinal uses: Aqueous extract is used as antipyretic (relieves fever) and calmative. Its root extract is given to children against cholera and lungs diseases.

Botanical name: *Senecio heteromella* D. Don.

Local name: Kho Jurree

Occurance: Chikar

Status: Herb

Folk medicinal uses: Extract is given against jaundice, arthralgia (Joint pain) and psychosis (non sense). Floral extract relieves scotoma by applying around the eye.

Botanical name: *Taraxacum officinale* Waber

Local name: Hund

Occurance: Chikar, Danna, Chatter Klaus, Chianari

Status: Herb

Folk medicinal uses: Root powder is diuretic tonic. It is chiefly used in kidney and liver diseases. In case of fodder, it increases the milk yielding capacity of cattle.

Botanical name: *Xanthium strumarium* L.

Local name: Khatula

Occurance: Danna

Status: Herb

Folk medicinal uses: Root extract is useful in cancer. Fruit is considered cooling and given in smallpox. Whole plants are supposed to possess powerful sedative properties. It is generally administered in the form of decoction and is said to be efficacious in long standing of malaria fever. Root extract is applied to ulcers and boils.

Balsaminaceae

Botanical name: *Impatiens edgeworthii* Hooker. F

Local name: Ban Till

Occurance: Danna, Chikar

Status: Herb

Folk medicinal uses: Aqueous extract is antipyretic (relieves fever) and also used as fodder.

Berberidaceae

Botanical name: *Berberis lycium* Royle.

Local name: Simlo

Occurance: Chikar, Danna, Chatter Klaus

Status: Shrub

Folk medicinal uses: The watery extract from the root and stem is used in ophthalmia fruit is cooling and laxative. Bark is used for the internal wounds, throat pains and against diabetes. Root powder is used in bone fractures.

Bombaceae

Botanical name: *Bombax ceiba* L.

Local name: Simel

Occurance: Danna, Chikar

Status: Tree

Folk medicinal uses: Young roots are used as astringent and tonic for brain, young fruits are stimulant.

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Buxaceae

Botanical name: *Sarcococca saligna* (D. Don) Muell

Local name: Ban Suthra

Occurance: Chikar, Bani Hafiz, Nato, Seri

Status: Shrub

Folk medicinal uses: Aqueous extract is used as antipyretic (relieves fever) and calmative.

Caesalpiniaceae

Botanical name: *Bauhinia variegata* L.

Local name: Kalyar

Occurance: Danna

Status: Tree

Folk medicinal uses: Bark is used as alliterative, tonic, astringent useful in skin diseases and ulcer. Dried buds are used in dysentery, piles, diarrhea and worms.

Cannabinaceae

Botanical name: *Cannabis sativa* L.

Local name: Bhang

Occurance: Danna, Chinari, Chatter Klaus

Status: Herb

Folk medicinal uses: The plant is used as tonic, narcotic and sedative. Dried and crushed leaves are taken as a drink for their narcotic action.

Caprifoliaceae

Botanical name: *Viburnum cotinifolium* D. Don

Local name: Guch

Occurance: Chikar, Bani Hafiz

Status: Shrub

Folk medicinal uses: Extract of the leaves is administered in menorrhagia. Fruit is laxative and blood purifiers.

Caryophyllaceae

Botanical name: *Silene vulgaris* L.

Local name: Butkurn

Occurance: Kayyari, Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: The plant is known as emollient and is used in bath. Locally it is used as fodder for cattle.

Celasteraceae

Botanical name: *Maytenus royleanus* Wall.

Local name: Putakh

Occurance: Chatter, Danna, Chinari

Status: Shrub

Folk medicinal uses: Seeds are smoked to relived toothache. The whole dried plant is used for the purpose of fuel.

Chenopodiaceae

Botanical name: *Chenopodium album* L.

Local name: Bathew

Occurance: Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Leaves and seeds are used as laxative, used in hepatic disorders and enlarged spleen. Aqueous extract of leaves given orally against jaundice and urinary diseases.

Cuscutaceae

Botanical name: *Cuscuta reflexa* Roxb

Local name: Neela Dara

Occurance: Common

Status: Herb

Folk medicinal uses: Extract of the whole plant is used for the removal of dandruff and is good hair tonic. Plants are carminative, alternative, purgative and diuretic used in jaundice and joints pain.

Euphorbiaceae

Botanical name: *Euphorbia helioscopia* L.

Local name: Dodel

Occurance: Danna

Status: Herb

Folk medicinal uses: Aqueous extract is wormicide (Worm killer) powder is applied for wound healing.

Botanical name: *Ricinus communis* L.

Local name: Hurnoli

Occurance: Danna, Chatter Klaus

Status: Shrub

Folk medicinal uses: It is plastered over the fractured bone and acts as dioplasia, and also against abarticulation (removal of bone joints). Oil obtained from the seeds is used as laxative and also given to children in case of constipation. Bark powder is used for healing of wounds.

Botanical name: *Mollotus philoppensis* (Lam.) Muell

Local name: Kamila

Occurance: Danna, Chatter Klaus

Status: Shrub

Folk medicinal uses: Powder obtained from the fruits is used as a vermifuge, purgative and certain parasitic skin diseases.

Fagaceae

Botanical name: *Quercus incana* L.

Local name: Reen

Occurance: Chikar, Bani Hafiz

Status: Tree

Folk medicinal uses: Corm is used as astringent and diuretic, also given in diarrhoea, indigestion & asthma.

Fumaraceae

Botanical name: *Fumaria indica* L.

Local name: Patpapa

Occurance: Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Aqueous extract is given orally in fevers, blood disorders, indigestion and mensis disorder. It is also used as ear drop in ear diseases.

Gentianaceae

Botanical name: *Gentiana kurro* Royle

Local name: Neeli Booti

Occurance: Chikar, Kayyari, Bani Hafiz, Seri

Status: Herb

Folk medicinal uses: Decoction of whole plant is used as blood tonic.

Geraniaceae

Botanical name: *Geranium wallichianum* Fisch

Local name: Ratten Jotte

Occurance: Kayyari, Chikar, Bani Hafiz

Status: Herb

Folk medicinal uses: Root powder is used in case of jaundice, kidney and spleen problems. Floral parts and leaves extract is used for vision problem and blood purification.

Hypericaceae

Botanical name: *Hypericum perforatum* L.

Local name: Takoo Jurree

Occurance: Chikar, Bani Hafiz, Nato

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Status: Herb

Folk medicinal uses: Whole plant is given to the cattle's in case of Takoo (Stomach problems) leaves are diuretic, laxative and good for piles.

Juglandaceae

Botanical name: *Juglans regia* L.

Local name: Akhrot, Khore

Occurance: Danna, Chikar

Status: Tree

Folk medicinal uses: Bark and leaves are chewed in toothache, fruit is edible. Wood is used in furniture and construction purposes.

Labiatae

Botanical name: *Mentha royleana* L.

Local name: Jangle Podina

Occurance: Common

Status: Herb

Folk medicinal uses: The dried leaves are made into powder and used with curd and as stomachache. Also used as carminative in diarrhea and dysentery.

Botanical name: *Mentha longifolia* L.

Local name: Breena

Occurance: Common

Status: Herb

Folk medicinal uses: Herbal tea is taken in abdominal disorders. Also used as carminative in diarrhea and dysentery.

Botanical name: *Micromera biflora* (D. Don) Benth

Local name: Chai Booti

Occurance: Common

Status: Herb

Folk medicinal uses: Used as herbal tea for the relief of joints pain and also used as fodder for cattle.

Liliaceae

Botanical name: *Allium cepa* L.

Local name: Payyaz

Occurance: Common

Status: Herb

Folk medicinal uses: Extract of the bulb is useful in vomiting, body pains, tumors and ulcer. Also used as condiment.

Botanical name: *Allium sativum* L.

Local name: Thoom

Occurance: Common

Status: Herb

Folk medicinal uses: Garlic is a diaphoretic, diuretic, expectorant, stimulant and antiseptic. It is also used as a remedy of leprosy. Syrup of garlic is effective for asthma, cough, difficulty of breathing and most of the diseases of the lungs particularly in chronic bronchitis.

Martyniaceae

Botanical name: *Martynia annua* L.

Local name: Kundyra

Occurance: chikar, Kayyari, Nato, Sari

Status: Herb

Folk medicinal uses: Aqueous extract is antipyretic relieves fever anti allergic relieves allergy blood purifies and calmative.

Meliaceae

Botanical name: *Melia azedarach* L.

Local name: Drek

Occurance: Common

Status: Tree

Folk medicinal uses: Flowers and leaves are used to relieve headaches. A decoction of leaves is applied in hysteria. Seeds are used against diabetes.

Mimosaceae

Botanical name: *Acacia modesta* Wall

Local name: Phuli

Occurance: Danna, Chatter Klaus

Status: Tree

Folk medicinal uses: The gum obtained from the bark is used as tonic and stimulant. Wood is used as fuel and construction purposes.

Botanical name: *Acacia nilotica* L.

Local name: Kiker

Occurance: Danna, Chatter Klaus

Status: Tree

Folk medicinal uses: Bark and seeds are used as astringent and in piles, diarrhea and dysentery. Wood is used as fuel.

Moraceae

Botanical name: *Morus alba* L.

Local name: Toot

Occurance: Chatter Klaus, Danna

Status: Tree

Folk medicinal uses: A decoction of the leaves is used in inflammation of throat. The fruit is used as cooling and laxative. Wood is used in agricultural implements. Branches are used in making baskets of different size.

Botanical name: *Ficus palmata* Forrsk

Local name: Phugvara

Occurance: Danna, Chatter Klaus, Hattian

Status: Tree

Folk medicinal uses: Fruit is used as cooling, alterative and laxative. Wood is used as fuel and construction purposes.

Botanical name: *Ficus bengalensis* L.

Local name: Boher

Occurance: Danna, Chatter Klaus

Status: Tree

Folk medicinal uses: The milk juice is externally applied for paints and bruises. The leaves are heated as a poultice, applied to abscesses. The root fibres are said to be given in gonorrhoea.

Myrsinaceae

Botanical name: *Myrsine africana* L.

Local name: Gokher

Occurance: Chikar, Bani Hafiz, Sari

Status: Shrub

Folk medicinal uses: Dried stem and branches are used as fuel.

Orchidaceae

Botanical name: *Habenana digitata* Lindle

Local name: Pir Gundal

Occurance: Chikar, Bani Hafiz, Sari

Status: Herb

Folk medicinal uses: Root powder is applied for joining the fractured bones. Dried powder is applied to pussy wounds, scabies and piles.

Oleaceae

Botanical name: *Olea ferruginea* Royle

Local name: Khov

Occurance: Common

Status: Tree

Folk medicinal uses: The decoction of the leaves is used for

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toothache. Leaves are bitter, astringent, antiseptic, antiperiodic and diuretic. Oil obtained from the fruit is used as rubefacient.

Oxalidaceae

Botanical name: *Oxalis corniculata* L.

Local name: Khatti jurree

Occurance: Common

Status: Herb

Folk medicinal uses: Juice of the plant is given in stomach trouble. Decoction of roots is useful for worms. The extract of the plant is applied in case of scorpion sting.

The results reported that medicinal plant species should be focussed for regeneration and propagation. Establishment of Botanical Garden is suggested in this regard. Periodic grazing should be replaced by rotatory grazing to conserve the endangered species. Local people should be considered in decision making. There is need to propagate awareness for the protection of wild medicinal plants. During collection not pluck all plants from any area.

Future demand

According to Rahim (1993) the future thrusts are as follows, There is an urgent need to explore the native flora of different environments.

A systematic cataloging be made of the life support species according to the habitat.

The information regarding their taxonomy, distribution, ecological characteristics, products (i.e. food, fuel, fiber, medicinal value, soil stabilization, etc) and their conservation factors are taken up at the earliest.

The germ plasm of some life support species is under threat due to habitat loss. Their conservation should be done on priority basis.

The selected and prioritized species should be popularized among our people for food, fodder, medicine and energy needs.

A long time storage should be arranged by the government so that biological life support system can be protected from future needs. The survival of *Homo sapiens* depends, on such protective measures.

Computer data system should be developed for our region (Pakistan).

The role of lesser-known plants should be explored.

The germ plasm of the life support species should be imported or exchanged with neighbour countries and introduced in the local habitat to improve the economic condition of local inhabitants.

Almost all plants can be life support species during the emergency conditions. It would be worth while to prepare a catalogue, the poisonous or toxic plants of particular habitat. The vast majority of underutilized wild species should be studied through our knowledge of biotechnology.

The useful genes of life support species be identified and incorporated into the crop genetic background to improve the adaptability of the crops.

The results of this study that medicinal species should be focussed for regeneration and propagation. Establishment of Botanical Garden is suggested in this regard. Periodic grazing should be replaced by rotatory grazing. Local people should be considered in decisions making. There is need to propagate awareness for the protection of wild medicinal plants that during collection not pluck all plants from any area.

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