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Medicinal folk recipes and conservation status of gymnospermic flora for livelihood security of Malam Jabba Valley, Hindu Kush Range, Swat, Pakistan

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Key words: Gymnosperms, Conservation status, Malam Jabba valley, Medicinal uses, Malam Jabba Valley, Swat Hindu Kush Range.

Abstract

The Malam Jabba Valley, district Swat has a diverse flora with the spectacular scenic beauty and unspoilt nature that attracts tourists across the globe and makes the valley a paradise for the nature and adventure lovers. Floristically the area is located in Hindu Kush Range, dominated by Sino-Japanese type of vegetation. A detailed investigation was carried out from April 2013 to August 2015 in order to explore the medicinal folk recipes and establish conservation issues of gymnospermic flora. The current study revealed information on 10 plant species belonging to 8 genera and 4 families used by the different ethnic groups of the research area. Ethnomedicinal information on medicinal folk recipes was mostly collected from farmers, Herbalists, shop keepers and elders belonging to different communities and habitats through interviews and group discussions. IUCN Red List Criteria, 2001, version 3.1, and 2003 Version 3.0 were used to establish conservation status of gymnospermic flora. It was concluded that most of the gymnosperms were Critically endangered in the research area due to habitat destruction, degradation, habitat fragmentation, unscientific and overexploitation of natural resources, overgrazing, and ruthless deforestation, forest fire, introduction of invasive species, pathogenic diseases, human population and anthropogenic activities. There is override need to safeguard the gymnospermic plant biodiversity for the sustainable livelihood security of the research area.

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Introduction

The valley of Swat, popularly known as the Switzerland of the east with its pristine scenic grandeur is highly popular among the tourists for its lavish display of natural majesty and scenery. The area is consists of 6226 Km² of land and can be traced within 34° 30´- 35° 55´N latitude and 71° 45´- 72° 50´E longitude. The District is composed of rocky mountainous series of Hindukush-Himalayan having great altitudinal variation, ranging from gentle slope in the south to very steep slopes at high altitude of northern parts (Ahmad, 1995) (Anonymus, 1998). Major portion of the area comes under the influence of Sino-Japanese floristic region (Ali and Qaiser, 1986).

The Malam Jabba is a beautiful lush green valley with an amazing variety of wild flowers which support spectacular plant biodiversity of promising economic value. Malam Jabba is located between the Himalayan and the Hindu Kush foothills of Khyber Pakhtunkwa (KP), Pakistan and located at a distance of 52 km from Saidu Sharif, the capital of Swat District. It is bounded by the District Buner in south-west, by the District Shangla in the North-East and by the main Swat River in the West.

The area is traced between 35°20′ to 35°45′ N latitude and 72°12′ to 73°32′ E longitudes. The lower part of Malam Jabba Valley consists of different villages such as Talegram, Ser, Shagai present at northeast and mostly narrow at structure.

The dominant and main villages at the lower part of the valley are Ilanae, Shinkat, Shaltalu, Kashora, Malam, Spin obo and Kuh having an altitude of 1270 m, 1500 m, 1660 m, 1600 m, 1800 m, 1900 m and 2300 m respectively. Manglauar, Talegram and Ser are main Villages found at the entrance of the Valley. The valley has altitudinal variation ranging approximately from 950 m in the South at Maglaur (Valley entrance) to more than 2880 m in the North (Valley highest top) while Shagar Sar is the highest peak of the area (Anonymous, 1998).

The Chir pine and *Quercus incana* occupying the low altitude ranging from 1000-1600m whereas blue pines dominates the higher elevation and mostly found at altitude of 1600-3000m dominates the shady places while *Cedrus deodara* and *pinus geradiana* found on exposed and dry rocks of the area. *Pinus wllichiana, Pinus gerardiana, Abies pendrow, Picea smithiana* and *Cedrus deodara* are evergreen species.

The area is surrounded by a series of high altitude covered with snow for most part of the year. Snowfall generally starts by the mid of November on the high peaks of valley and descend downwards as the temperature falls.

The climate is cool and refreshing in the valley during summer in the upper part of the Valley while mild hot in the lower part and temperature may goes as high as 37 C° in the month of July and August. During the winter the climate is very cold and snowy in the upper part of the Valley and generally remains below the freezing point in the month of January and February (Anonymous, 1998).

Much work is available on the different aspects of angiospermic flora and vegetation of Swat and adjacent mountainous areas i.e Khaliq and Hussain 1995, compiled 140 taxa belonging to 53 families from Dabagai hills, Swat.

Shinwari *et al.,* 1995 documented the ethnobotanical profile of Kaghan Valley with some medicinal and fodder species.

Hussain *et al.,* 2006 reported 121 plant taxa from Shawar valley, used for various applications in the area. Islam, M. *et al* 2006 enlisted 30 plans from Shawar valley, of these, 8 plant species were pure weeds and 22 plants as weed with medicine. Hussain *et al.* 2006 collected the ethnobotanical data of 12 gymnosperms from Kaghan Valley. Guljan *et al.,* 2009, collected data of 11 species of gymnosperms from Dir Kohistan.

Razzaq *et al.* (2010) carried out a detailed field studies and elaborate the ethno medicinal plant potential of Changa valley District Shangla, Pakistan. A total of 50 taxa belonging to 32 families were recorded.

A very fragmentary and negligible has been done on the gymnospermic flora of the world and Pakistan**.** A few workers have contributed to the gymnosperm flora of Pakistan i.e Daud *et al*., 2013 explored ethnotaxonomical study of Gymnosperms of Razmak North Waziristan agency (NWA) and reported 11 plant species belong to 4 families.

Hadi *et al.,* (2013) studied ethno botanical woody plants of Rech Valley, Torkhow, District Chitral. A total of 29 medicinal plants belonging to 21 genera and 16 families were used locally for different ailments and other purposes.

Razzaq *et al.,* (2013) studied on ethno botanical profile and conservation status of Plant Biodiversity in Alexander the Great Valley, Shangla, Pakistan. A total of 32 plant species were collected from the Valley. These plants include herbs, shrubs and trees.

Hadi *et al*., 2014 documented Ethno botanical Profile of Gymnospermic Flora of Kalash Valley, District Chitral. Nine gymnosperms were reported belonging to seven genera and three families growing at Bumburet, Birir and Rumbor areas of famous and historical Kalashvalley, district Chitral, Pakistan.

The Valley is virgin and unexplored on this aspect and therefore a detail investigation of gymnospermic flora was carried out with special reference to their conservation status and medicinal folk recipes for the sustainable livelihood security and safety of the area.

Materials and methods

Frequent field trips were arranged to the different localities and sub localities of the research area. A semi structured questionnaire was developed and filled to record information on ethnomedicinal plants regarding their Botanical name, family name, Vernacular name, part used, habit, habitat, part used, traditional and folk recipes, mode of administration, effectiveness, collection methods, collection time, flowering seasons, distribution, availability, abundance and conservation status. Information on medicinal folk recipes was mostly collected from farmers, herbalists, farmers and elders belonging to different communities and habitats through interviews and group discussions. IUCN Red List Criteria, 2001, 2003 were and direct observations were used to investigate conservation status of gymnospermic flora.

The plants specimens were pressed, dried, preserved, mounted on the herbarium standard sheets of size 41.25 cm x 28.75 and identified with the help of available literature and flora of Pakistan. (Nasir and Ali, 1970-89; Ali and Nasir, 1989-1991; Ali and Qaiser, 1993-2016.

For detailed verification a detailed morphology and taxonomic characters of collected voucher plant specimens were compared with different sources likes published papers, books, internet, available monographs, and voucher specimens of other herbaria. Boulos (1938) will be followed for terminologies of various medicinal plants. Voucher specimens were deposited at Herbarium of Center of Plant Biodiversity (HCPB), University of Peshawar.

Results

Ethnomedicinal description

Botanical Name: *Abies pindrow* Royle (Plate 1, B)
Family: Pinaceae
Vernacular Name: Achar
Habit: Tree
Flowering period: March-April
Locality: Mostly found at higher altitude & north side of temperate forest
Conservation Status: Endangered (EN)
Collection method: Plucking/Cutting
Part Used: Leaves

Folk Recipes

The leaves are powdered and mixed with honey and used for treatment of cough, cold and chest infection. The nomads used the leaves as substitute of tea.

Medicinal Use

Leaves of plant are used for treatment of cough and cold.

Regional distribution

Afghanistan, Pakistan, West Himalaya, Kashmir & Nepal

Local distribution

KP, Swat, Chitral, Kohistan, Battagram, Dir, Shangla, Rawalpindi District, Hazara, Muree hills, Khyber Agency, Kashmir. Found between altitudinal ranges 2000-3100 m.

Botanical Name: *Cedrus deodara* (Roxb. Ex Lamb) G. Don (Plate 1, C)
Family: Pinaceae
Vernacular Name: Dyar, Deodar
Habit: Tree
Flowering period: October
Locality: Mostly found at higher altitude & prefer dry steep slopes
Conservation Status: Critically endangered (CR)
Collection method: Picking
Part Used: Wood oil (Resins)
Folk Recipes: Locally 2 -3 drops of resin extract is taken with a glass of milk early in the morning before breakfast for curing skin rashes & other skin ailments. 2-3 drops of wood extract or resin extract (Ranzra) is taken with a glass of water for blood purification and lowering body temperature.

Medicinal Use: Locally resin or oil extract of wood is diuretic, carminative, antipyretic, and also used in piles, rheumatic problems, ulcers and various skin diseases.
Animal Use: The extract or resin of wood (Ranzra) is also used as anthelmintic for livestock.
Regional Distribution: Afghanistan, Pakistan, Kashmir, Nepal and India.
Local Distribution: Mostly found in West Himalayas, Swat, Dir Kohistan, Khyber Agency, Hazara, Kohistan, Shangla, Dir, Chitral, Murree hills between altitudinal ranges 2000-3000 m.

Botanical Name: *Cupressus sempervirens* L.
Family Name: Cupressacaeae
Vern. Names: Serva
Habit: Tree
Flowering period: Feb-March
Locality: Usually cultivated in lower plains & foot hills
Conservation status: Cultivated/Alien (IUCN Red List Criteria is not applicable)
Collection method: Picking
Part used: Fruit
Medicinal Use: The fruit is used as anthelmantic and astringent.
Local Distribution: KP, Gilgit Islamabad, Dir, Swat, Shangla, Chitral, Hazara, widely cultivated in the lower plain and foot hills upto 1100 m.

Botanical Name: *Ephedra gerardiana* Wall. ex Stapf (Plate 1,
Family Name: Ephedraceae
Vern. Names: *Asmani bootai,*
Habit: Shrub
Flowering period: May to July
Locality: Usually growing in dry rocky slopes of higher altitude
Conservation status: Endangered (EN)
Collection method: Digging, Cutting & Picking
Part used: Shoot, roots and Fruit
Constituents: Ephedrine
Folk Recipes: The young shoots and branches are crushed into powdered and boiled in water to get extract which is used twice times a day in morning and evening time after meal for treatment of asthma, hay fever and cold. The decoction of young shoots is used as expectorant & febrifuge. Ash obtained from root of *Ephedra* is used to treat cuts and wounds.

Medicinal Use: Plant is cardiac stimulant, blood purifier, febrifuge & expectorant. The young shoots are used in asthma, cold & hay fever. Fruit and extract of shoots is used for cleaning of teeth & blood purification.

Regional Distribution: Afghanistan, S.W China, Pakistan, Kashmir India, W. Nepal

Local Distribution: Baluchistan Ziarat, Himalayan areas of KP, Swat, Dir, Chitral, Kohistan, Hazara, Kaghan, Baltistan, Kashmir. Usually grow in inner drier valleys of Himalayas between 2200-3500 m.

Botanical Name: *Juniperus communis* L.
Family Name: Cupressaceae
Vern. Names: Gugar/Shahroos
Habit: Mdium sized tree
Flowering period: April-May
Locality: Usually growing in alpine region of the area
Conservation status: Vulnerable (VU)
Collection method: Digging, Plucking & Picking
Part used: Leaves, fruits, roots
Folk Recipes: An infusion of berries is used as diuretic. The powdered berry is used as remedy for treatment of swelling, and other skin problems. Dried leaves of *Juniperus* and *Skimmia* are mixed and burned in combination. The smoke is used to cures the effect of bad and evil eyes.

Medicinal Use: Root of plant is used for wound healing. The oil obtained from berries is used as antiseptic, stomachic, carminative, diuretic, antirheumatic & blood tonic. Medicinally the plant is also used against tension and depression. It is also used for blood purification and mental refreshment.
Local Distribution: Pakistan, India, Kashmir, Nepal
Local Distribution: KP, Swat, Chitral, Hazara, Kohistan, Battagram, Shangla, Dir, Chitral, Kaghan, Gilgit, Baltistan, Baluchistan & Kashmir. Usually growing in alpine region of Himalayas from 2700 – 4000 m.

Botanical Name: *Picea smithiana* (Wall.) Boiss (Plate 1, D)
Family Name: Pinaceae
Vern. Names: Mangazay, Himalayan spruce
Habit: Tree
Flowering period: April-May
Locality: Commonly found mixed with blue pine & fir forest
Conservation Status: Critically endangered (CR)
Collection method: Plucking & Picking
Part used Leaves & Resins
Folk Recipes: A tea prepared from fresh leaves of *Picea smithiana* is used once in a day for one week to remove stone from kidney.

Medicinal Use: Locally leaves of plant are used as remedy for kidney stone and rheumatism. Resin is collected locally & used as remedy for cracks of heels and wounds.

Regional Distribution: Himalayan region of Afghanistan, China, Pakistan, India, Kashmir & Nepal
Local Distribution: Mostly in Himalayas, Swat, Chitral, Dir, Shangla, Hazara, Kohistan, Battagram, Kurram, Kashmir, growing between altitudinal ranges 2300-3600 m.

Botanical Name: *Pinus gerardiana* Wall.
Family Name: Pinaceae
Vern. Names: Chilghoza Pine
Habit: Tree
Flowering period: June July
Locality: Inner dry areas & rocky slopes of the valley
Conservation Status: Critically endangered (CR)
Collection method: Picking, Cutting & Plucking
Part used Seeds, barks, leaves and resins.

Folk recipes: The seeds are edible commonly called “Chilghoza nut” used as dry fruit, tonic and stimulant. Juice is obtained from the fresh leaves and added with water and taken twice a day before meal for curing of lung infections and sore throat. Dried leaves and bark is grinded into powdered & taken with glass of water for diarrhea. A decoction of the leaves is used for curing of scabies

Medicinal Use: Seeds are tonic and stimulant. Resin or oil obtained from the bark of wood is used for skin disorders and healing of wounds.

Regional Distribution: Inner dry tract of NW Himalayas, Afghanistan, China, Pakistan, Kashmir & India

Local Distribution: Baluchistan, KP, Swat, Chitral, Dir, Buner, Shangla, Hazara, Gilgit, Astor, Kashmir. Mostly found in inner dry valleys of the Himalaya and Baluchistan between altitudinal ranges 1600-2700 m

Botanical Name: *Pinus roxburghii* Sargent (Plate 1, E)
Family Name: Pinaceae
Vern. Names: Nakhtar, Chir pine
Habit: Tree
Flowering period: March-April
Locality: Mostly growing in rocky hills but at higher altitude it form association with *Pinus wallichiana* tree
Conservation Status: Endangered
Collection method: Picking & Cutting
Part used Resins (Jaula), bark

Folk recipes: Resin or oil obtained from the wood is externally applied as a plaster for heeling of wounds and also to treat cracked heel. Resin of bark locally known as "Jaula", is stimulant used in ulcer, constipation, snake and scorpion stings. It is also used as blood purifier. The resin is boiled with milk & used to treat acne.

Medicinal use: Medicinally resin of bark is used for skin diseases, external wounds, blood purification, ulcer, constipation, snake & scorpion bites.
Regional Distribution: Foot hills & outer valleys of Himalayan region of Afghanistan, Pakistan, Kashmir, India, Nepal

Local Distribution: Hindu Kush range, KP, Swat, Lower DIr, Chitral, Hazara, Buner, Shangla, Battagram, Natia gali, Murree hills, Kashmir

Botanical Name: *Pinus wallichiana* L. (Plate 1, F)
Family Name: Pinaceae
Vern. Names: Peouch, Blue Pine
Habit: Tree
Flowering period: April-May
Locality: Mostly growing at higher altitude, often mixed with *Abies, Picea & Quercus* in temperate forest.
Conservation Status: Endangered
Collection method: Picking & Plucking
Part used Resins and leaves

Folk Recipes: A tea prepared from the leaves has traditionally been used for the treatment of bronchitis, cough & asthma. 3-4 drops of resins are added with mustard oil & is applied on the ruptured skin for healing of wounds.

Medicinal/Folk use: Locally plant is used for the treatment of external wounds, asthma, bronchitis & cough.

Regional Distribution: Afghanistan, China, Pakistan, Himalaya, Kashmir, Nepal, Myanmar & Bhutan

Local Distribution: KP, Swat, Chitral, Kohistan, Battagram, Dir, Buner, Hazara, Bara Gali, Muree hills, Islamabad & Kashmir. Mostly found from 1600-3300 m.

Botanical Name: *Taxus wallichiana* Zucc (Plate 1, G)
Family Name: Taxaceae
Vern. Names: Banya
Habit: Tree
Flowering period: Feb-March
Locality: Found at higher altitude/open slope of temperate forest
Conservation status: Critically endangered
Collection method: Cutting, Plucking & Picking
Part used: Bark, leaves, shoot, fruit, root,
Constituents: Taxol

Folk Recipes: Bark of *Taxus wallichiana* is crushed into powdered which is then mixed with cup of milk & used as antispasmodic & emmnagogue. Decoction of root is used in hepatic problems & jaundice. Decoction of bark is used in muscular painand also as tea substitute.

Medicinal Use: Leaves of palnt are used in asthma, cough, bronchitis, epilepsy, stomach disorders, & indigestion. Bark is a source taxol, used in cancer & considered as antitumerous agent. Powdered bark is used as antispasmodic. Fruits are used as sedative and antiseptic.

Regional Distribution: From Himalayas to Afghanistan, China, NW India, Burma, Pakistan, Kashmir, Bhutan, Vietnam & Myanmar

Local Distribution: Hindu Kush Range, Kp, Swat, Dir, Chitral, Hazara, Battagram, Kohistan, Kaghan, Khyber Agency, Murree, Kashmir
Commonly found in moist and temprate valleys of Himalayas from 1800 -3000 m.

Results and discussion

Despite the fact that ethno medicinal and veterinary gymnospermic flora has been very crucial in indigenous system of medicine for the human and animal health care of most region of our country, it has not yet been well explored, analyzed, documented and also their documentation is very much neglected in remote areas of our country.

Much effort and works is needed for research and integration activities in the field of gymnospermic plant biodiversity to enhance the sustainable livelihood security and safety of the area.

Table 1. Diversity & Conservation Status of Gymnospermic flora in Malam Jabba Valley, Hindu Kush Range, Swat, Pakistan.

SN	*Family*	*Botanical name*	Habit	Conservation status
1.	Cupressacaeae	*Cupressus sempervirens* L.	Tree	Cultivated/ Exotic
		Juniperus communis L.	Shrub	Vulnerable (VU)
		Thuja orientalis L.	Tree	Cultivated/ Exotic
2.	Ephedraceae	*Ephedra gerardiana Wall.*ex Stapf	Shrub	Endangered (EN)
3.	Pinaceae	*Abies pendrow* Royle	Tree	Endangered (CR)
		Cedrus deodara (Roxb. ex Lamb) G. Don	Tree	Critically endangered (CR)
		Picea smithiana (Wall.) Boiss	Tree	Critically endangeredd (CR)
		Pinus gerardiana Wall. ex Lamb.	Tree	Critically endangered (CR)
		Pinus roxburghii A.B Jackson	Tree	Endangered (EN)
		Pinus wallichiana L.	Tree	Endangered (EN)
4.	Taxaceae	*Taxus wallichiana* Zucc.	Tree	Critically endangered (CR)

Considerable descriptive work on ethnomedicinal and conservation studies of flowering plants has been carried out by different workers on the different areas of Pakistan but due to extremely varied and diverse flora of Pakistan, the works seems to be fragmentary and negligible.

Therefore, a comprehensive study is scheduled for documentation and exploration of the Ethno medicinal and Conservation status of Gymnospermic plant biodiversity for the sustainable livelihood security and safety of the area.

The present study was initiated to enlist the gymnospermic flora of Malam Jalam Jabba Valley, Hindu Kush Range, Swat. Eleven plant species, belonging to 9 genera and 4 families were identified. Pinacea was the leading family with with 4 genera and 6 species followed by Cupressaceae with 3 genera and 3 species whereas Ephedraceae and Taxaceae are monophyletic families and contribute one genus and species each (Table 1).

Like other medicinal plants, gymnosperms are also used in the valley by local community for medicinal purposes and treatment of various ailments and livestock diseases. A total of 10 medicinal plant taxa, belonging to 8 genera and 4 families were used for treatment of human and animal health care.

Most of the plant taxa are native to the area. Majority of the plant had single use in traditional system of medicine where as some species have multiple uses for treatment of various ailments.

Table 2. Ethnomedicinal and conservation status of gymnospermic flora in malm jabba valley, swat.

S.	Family	Species	Local Name	Part used	Folk Use	Conservation status	Voucher Number
2	Cupressacaeae	*Cupressus sempervirens L.*	Serva	Fruit	The fruit is used as anthelmantic and astringent.	Cultivated/ Alien IUCN Catogory not applicable	Razzaq 27 (UPBG)
		Juniperus communis L.	Gugar/ Awbeer	Leave fruits, roots	Root of plant is used for wound healing. The oil obtained from berries is used as antiseptic, stomachic, carminative, diuretic, antirheumatic & blood tonic. Medicinally the plant is also used against tension and depression. It is also used for blood purification and mental refreshment Recipes: An infusion of berries is used as diuretic. The powdered berry is used as remedy for treatment of swelling, and other skin problems. Dried leaves of *Juniperus* and Skimmia are mixed and burned in combination. The smoke is used to cures the effect of bad and evil eyes.	Vulnerable (VU)	Razzaq 28 (UPBG)
	Ephedraceae	Ephedra gerardianaWall.ex Stapf	Asmani booti	Shoots & roots fruits	Plant is cardiac stimulant, blood purifier, febrifuge & expectorant. The young shoots are used in asthma, cold & hay fever. Fruit and extract of shoots is used for cleaning of teeth & blood purification Recipes: The young shoots and branches are crushed into powdered and boiled in water to get extract which is used twice times a day in morning and evening time after meal for treatment of asthma, hay fever and cold. The decoction of young shoots is used as expectorant & febrifuge. Ash obtained from root of *Ephedra* is used to treat cuts and wounds.	Endangered (EN)	Razzaq 30 (UPBG)
3	Pinaceae	*Abies pendrow*	Achar	Leaves	Leaves of plant are used for	Endangered	Razzaq 32

Royle		treatment of cough and cold Recipes: The leaves are powdered and mixed with honey and used for treatment of cough, cold and chest infection. The nomads used the leaves as substitute of tea.	(EN)	(UPBG)
Cedrus deodara Diar, (Roxb. Ex Lamb) Deodar G. Don	Wood oil Resins	Oil or resin extract of wood is diuretic, carminative, antipyretic, and also used in piles, rheumatic problems, ulcers and various skin diseases Recipes: Locally 2 -3 drops of resin extract is taken with a glass of milk early in the morning before breakfast for curing skin rashes & other skin ailments. 2-3 drops of wood extract or resin extract (Ranzrah) is taken with a glass of water for blood purification and lowering body temperature. Animal Use: The oil or resin of wood which is locally known as "Ranzrah" is administrated to the livestock as anthelmintic.	Critically endangeredd (CR)	Razzaq 33 (UPBG)
Picea smithiana Mangazay *(Wall.) Boiss*	Leaves Resin	Locally leaves of plant are used as remedy for kidney stone and rheumatism. Resin is collected & locally used as remedy for cracks of heels and wounds Recipes: A tea prepared from fresh leaves of *Picea smithiana* is used once in a day for one week to remove stone from kidney.	Critically endangered (EN)	Razzaq 31 (UPBG)
Pinus gerardiana Wall. Chilghoza	Resins (Jaula) bark	Seeds are tonic & stimulant. Resin or oil obtained from the bark of wood is used for skin disorders and healing of wounds. Recipes: The seeds are edible commonly called "Chilghoza nut" used as dry fruit, tonic & stimulant. Juice is obtained from the fresh leaves and added with water and taken twice a day before meal for curing of lung infections and sore throat. Dried leaves and bark of plant is grinded into powdered & taken with glass of water for diarrhea. A decoction of the leaves is used for curing of scabies.	Critically endangered (EN)	Razzaq 34 (UPBG)

		Pinus roxburghii Sargent Nakhter	Resins (Jaula) bark	Medicinally resin of bark is used for skin diseases, external wounds, blood purification, ulcer, constipation, snale & scorpion bites Recipes: Resin or oil obtained from the wood is externally applied as a plaster for heeling of wounds and also to treat cracked heel. Resin of bark locally known as "Jaula", is stimulant used in ulcer, constipation, snake & scorpion stings. It is also used as blood purifier. The resin is boiled with milk & used to treat acne.	Endangered (EN)	Razzaq 35 (UPBG)
		Pinus *wallichiana* A.B Jackson Peuch	Leaves	Locally plant is used for the treatment of external wounds, asthma, bronchitis & cough. . Recipes: A tea prepared from the leaves has traditionally been used for the treatment of bronchitis, cough & asthma. 3-4 drops of resins are added with mustard oil & is applied on the ruptured skin for healing of wounds..	Endangered (EN)	Razzaq 36 (UPBG)
4	Taxaceae	*Taxus wallichiana* Zucc Banya	Leave, barks, roots	Leaves of palnt are used in asthma, cough, bronchitis, epilepsy, stomach disorders, & indigestion. Bark is a source taxol, used in cancer & also considered as antitumerous agent. Powdered bark is used as antispasmodic. Fruits are used as sedative and antiseptic. Recipes: Bark of *Taxus wallichiana* is crushed into powdered which is then mixed with cup of milk & used as antispasmodic & emmnagogue. Decoction of root is used in hepatic problems & jaundice.. Decoction of bark is used in muscular pain and also as tea substitute.	Critically endangered (CR)	Razzaq 37 (UPBG)

Medicinal plant biodiversity are important source of source of drugs in traditional system of medicine. Human and especially mountainous community used these medicinal plant resources for the treatment of human and livestock health care since time immemorial. Even today they are the main source of traditional health care especially remote area.

Despite the fact that ethno medicinal and veterinary gymnospermic flora has been very crucial in indigenous system of medicine for the human and animal health care of most region of our country, it has not yet been well explored, analyzed, documented and also their documentation is very much neglected in remote areas of our country.

Much effort and works is needed for research and integration activities in the field of medicinal plant biodiversity to enhance the sustainable livelihood security and safety of the area.

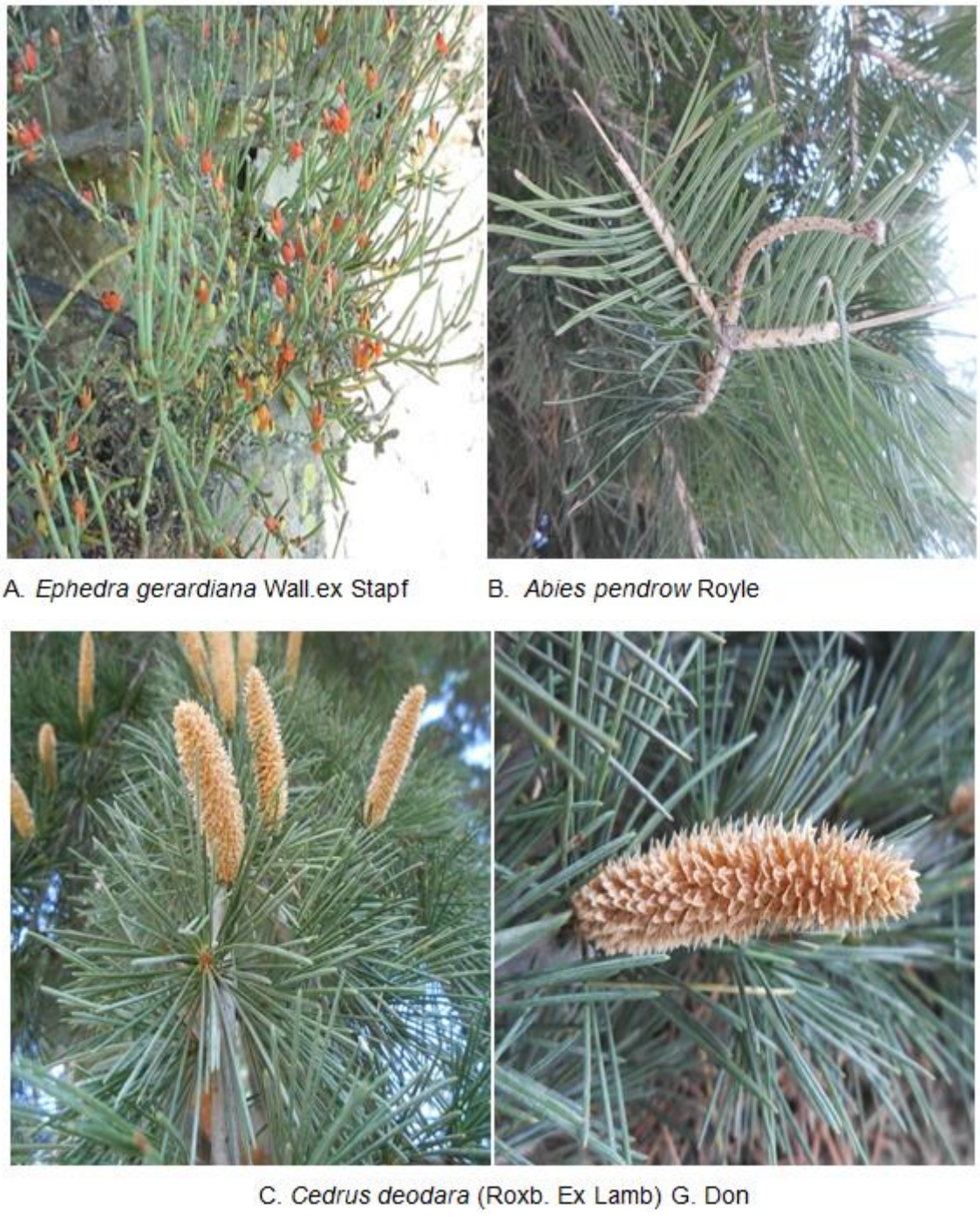

Fig. 1a. Flowering part of different angiosperm plants

People of the area are very poor and primarily dependent upon plant resources to fulfill their basic and life needs. The gymnosperm is major source of income for the livelihood security and safety of the area as local communities utilize these gymnopermic plant resources for fuel wood, fodder and medicinal plant purposes.

D. *Picea smithiana* (Wall.) Boiss E. *Pinus roxburghii* Sargent

F. *Pinus wallichiana* L. G. *Taxus wallichiana* Zucc

Fig. 2b. Flowering part of different angiosperm plants

Plant resources are under high biotic pressure of due to over exploitation, overgrazing, fuel wood collection, medicinal plant collection and ecotourism. Some highly valuable plant taxa like *Abies pendrow, Cedrus deodara, Pinuswallichina, Pinus longifolia* are severely threatened and Critically endangeredd due to texcessive use for fuel, timber and medicinal plant collection. Ruthless and indiscriminate deforestation severely affect the whole ecosystem and natural beauty of the area which are the dominant source of income in the form of ecotourism for sustainable livelihood security of the area. There is over ride to protect the natural plant resources and ensure their sustainable use for better and longterm livelihood security and safety of the area.

Conservation issues

Gymnospermic plant biodiversity of our planet is slumping at an alarming rate resulting in soil erosion, habitat loss and degradation; drying, desertification

and flooding that adversely damage the health of our ecosystem. The Pakistan is also facing same led to extreme declines in plant natural resources especially gymnospermic flora.

A total of 10 plant taxa were evaluated for their conservation status. Of these, 4 plant species were assessed as Critically endangered (CR), 4 as Endangered (EN), 1 as Vulnerable (VU) & 1 as exotic/cultivated (NE). (Table.2) Dominant factors which are used for the evaluation of conservation status are A. Population reduction, B. Geographical range/Restricted distribution, C. Small population size & decline D. Very small & restricted population & number of mature individuals in the wild E. Quantitative Analysis, probability of extinction in the wild.

The taxa depend on each or any of these five criteria determine conservation values of plant biodiversity. Gymnospermic flora of the research area is under high biotic pressure due to fuel wood collection, ruthless and indiscriminate deforestation for different purposes, over exploitation of medicinal plants, and overgrazing.. Some highly valuable plant taxa like *Abies pendrow, Cedrus deodara, Pinus wallichina* and *Pinus longifolia* are severely threatened due to to excessive use for fuel, timber and medicinal plant collection. Ruthless and indiscriminate deforestation severely affect the whole ecosystem and natural beauty of the area which are the dominant source of income in the form of ecotourism for sustainable livelihood security of the area. There is over ride to protect the natural plant resources and ensure their sustainable use for better and longterm livelihood security and safety of the area.

Conclusions

The present studies revealed that 11 gymnospermic plants are present in Malam Jabba Valley, Hindu Kush Range, Swat. These species are mainly used as fire and timber wood however large number of animals and human ailments are treated through these plant species in a traditional ways.

Due to their frequent utilization in daily life, these plant species are extensively exploited and over collected which resulted their rapid decline in the area. The over exploitation and over collection caused huge biotic pressure and severely threatened the gymnospermic plant biodiversity in the area which will further effect ecosystem services, ecotourism & livelihood security of the local community & safety of the area as well.

Recommendations

The gymnospermic flora are rapidly decline due to overharvesting and most of the species are thretend to extinction in near future therefore some serious measurements must be taken to conserve the great loss of these plant biodiversity for sustainable livelihood security of the area.

Similarly other suitable and fast growing trees should be introduced to in the area to fulfill the fire and timber requirement of the area.

Conservation practices and awareness programs that address issues of conservation and sustainable utilization of plant resources will be strongly desirable in the area.

To ensure sustainable utilization and management of gymnospermic flora for sustainable livelihood security of the area.

Participation of local community to conserve these plant biodiversity in their native habitats.

To identify factors affecting gymnospermic flora and indigenous knowledge of the area.

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