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Original Research Article

ETHNOTAXONOMICAL STUDY OF GYMNOSPERMS OF RAZMAK NORTH WAZIRISTAN AGENCY (NWA)

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ABSTRACT

The research work presented was initiated to get information and report the distribution of Gymnosperms and their indigenous uses by the local inhabitants of sub-division Razmak, North Waziristan Agency (NWA). As a whole 11 plants species belonging to 4 families of gymnosperms were collected, briefly documented with botanical name, occurrence along with ethno-botanical uses and are preserved in the Department of Botany, UST Bannu. These families were Pinaceae, Taxaceae, Ephedraceae and Cupressaceae. The indigenous knowledge of local people about the use of these native and cultivated plants was collected through interview during field visits by using questionnaire. During visits, it was found that the inhabitants of the concerned area use these plants for food fodder, shelters, construction and fuel purposes and also utilized as a medicine and detergents. As These species are under high biotic pressure like over grazing, browsing and other human activities e.g. cuttings for fire wood and construction. Ruthless collection of Gymnosperms had threatened their existence and more Gymnosperms are becoming vulnerable due to their habitat destruction. *Abies pindrow*, *Cedrus deodara* and *Pinus roxburghi* are threatened species. There is a dire need of attention to the conservation of Gymnosperms otherwise, these Gymnosperms will be lost very soon and become extinct in this area. In view of this fact, an attempt has been made in this research work, record Gymnosperms type and their uses in Razmak area.

Keywords: Gymnosperms, indigenous, inhabitants, Razmak.

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INTRODUCTION

In Pakistan there are seven agencies among which North Waziristan Agency is also included. The whole Waziristan is a single unit but for administrative convenience it has been splitted into two agencies i.e. North and South Waziristan agencies. The important ranges in the Waziristan hills are; Shoider, Shawal, Vezda and Lasan. In NWA, there are three sub-divisions which are: Razmak, Mirali, Miranshah and 10 Tehsils. The total area of NWA is about 4707 sq km. The Razmak sub division has 3 tehsils i.e. (a) Razmak (b) Garyum and (c) Dosali. Razmak is surrounded by medium and high mountains. There are some plain grounds in Razmak but its lengths are usually small. In Razmak, Toori khel and Boora khel of Utmanzai Wazir tribe are living. Here, the famous places are; Razmak cadet college, Razmak camp, Alexandra fort and Donken check post.

Razmak is situated at the South of Miranshah NWA, FATA, Pakistan, Asia. It is a boundary between SWA and NWA. It lies between 32, 41, 22 North, 69, 50, 31 East. Razmak is connected with Tank via Jandola and on the other hand with distt; Bannu via Mirali and Isha. The distance between Isha and Razmak is about 65 km. The mountains of NWA are geographically attached with Koh-e-sufaid in the North and Suleiman in the South. The height of NWA from sea level is about 1500 (4921 feet) to 2500m (8202 feet) while Razmak height is about 1828m (6000) to 3353m (11000) feet from the sea level. Razmak forests containing gymnosperms can be broadly described under the following major types; (1) Sarpunga, (2) Namrezye.

- (1) **Sarpunga:** GPS value: Latitude=32 4624.18N, Longitude=69 4726.20 E, Altitude=2951m (9682 feet), Located at= North-West side of Razmak.
- (2) **Namrezye:** GPS values: Latitude=32 4917.24N, Longitude= 69 48 53.49E, Altitude=2034m (6673feet), Located at=North side of Razmak and comparatively at low altitude.

Beside various plant species, Gymnosperms like *Piceae smithiana*, *Abies pindrow*, *Pinus williachiana* and *Pinus jerardiana* are abundant in the mountains located at the periphery of Razmak, while *Abies pindrow*, *Pinus wallichiana* and *P jerardiana* etc are present naturally at the elevation of 8000 to 11000 feet in the periphery of Razmak like the forests of Sarpunga and Namrezye located at the West-North side. *Pinus wallichiana*, *Abies pindrow* and *Pinus jerardiana* are also present in the Khaddar Khel and Shawal forests which are away from Razmak. [1] worked on ethnobotanical research project in the Galliyat areas of KPK province and reported 40 plants in which 5 were belonging to gymnosperms while the rest to angiosperms mostly used for medicinal, timber and food purposes. [2] collected the ethno botanical data of 12 gymnosperms from Kaghan Valley. [3] studied the gymnosperms of Kashmir Himalaya. [4] visited and collected ethno botanical data of Haramosh and Bugrote Valleys in Gilgit of Northern areas of Pakistan, and reported 48 species of trees and herbs. Out of 48, there are 8 species of gymnosperms like *Pinus gerardiana*, *Picea smithiana* and *Ephedra gerardiana* etc. [5] collected data of 11 species of gymnosperms from Dir Kohistan valleys. [6] described 63 wild and exotic gymnosperms species belonging to 10 families from Uttarakhand central Himalaya India. [7] studied the ethnobotanical Classes of the Flora of Allai Valley District Battagram Pakistan. [8] collected ethnobotanical data of 3 families of gymnosperms from Himalaya, Ladak, Eastward to Kashmir, Jayantia and Naga hills. [9] reported 140 ethnobotanically important medicinal plants of Chitral Gol National Park (CGNP) Pakistan used for medicinal, fuel, timber wood, food, and fodder for cattle. [10] investigated ethnobotanical activities of four plants; *Chrozophora hierosolymitana* Spreng (Euphorbiaceae), *Ephedra gerardiana* Wall. ex Stapf (Ephedraceae), *Chrysanthemum leucanthemum* L. (Astraceae), and *Quercus dilatata* L. (Fegaceae)] collected from different regions of Pakistan.

MATERIALS AND METHODS

Work on Ethno taxonomical aspects of Razmak Gymnosperms was carried out during session 2011-2012. The collection of Ethnobotanical study, Statistical data of Razmak forest and these Gymnosperms was collected through using various sources like questionnaire, interviewing, tape-record, camera and nokia E-73 mobile. Interviews of about 70 people including Asstt director Agricultural deptt; NWA, Manager of Agriculture for Razmak area, Staff of Forest department NWA, Planning officer NWA, Pansaries, Herbalists, Herdsmen and common people of the local community were conducted randomly. The indigenous

knowledge was analyzed and documented. For the identification i.e. "Taxonomic study", specimens of these Gymnosperms were collected from the area, studied their morphology and compared with already available sources containing knowledge about Gymnosperms like research papers, internet sources, identification keys and books. Stereo microscope was used for deep study. The specimens were dried and processed for identification with the help of Flora of Pakistan [11,12,13,14]. Dried species were poisoned by 2% solution of Mercuris Chloride and Ethyle Alcohol, mounting of specimens was made on standard herbarium of sheets of size (41.25cm x 28.75cm).

RESULTS AND DISCUSSION

In the present research work 11 plants species belonging to 4 families of gymnosperms were collected, briefly documented with botanical name, occurrence along with ethno-botanical uses and are preserved in the Department of Botany, UST Bannu. This was the first attempt to disclose the treasury of Razmak's Gymnosperms. The prominent gymnosperms present in the outskirts of Razmak were: *Abies Pindrow*, *Pinus jerardiana*, *Piceae smithiana*, *Ephedra jerardiana*, *Araucaria cockii*, *Pinus walliachiana*, *Cedrus deodara*, *Taxus wallichiana*, *Pinus roxburgii*, *Thuja occidentalis* and *Cupressus sempervirens* belonging to 4 families, Pinaceae, Taxaceae, Ephedraceae and Cupressaceae.

Table 1. Use value of Collected plant species

Plant	Use Value	% uses
<i>Abies pindrow</i> Royle	62/70 = 0.886	88
<i>Araucaria columnaris</i> R.Br	30/70 = 0.429	43
<i>Cedrus Deodara</i> Roxb	70/70 = 1.0	100
<i>Cupressus sempervirens</i> L	55/70 = 0.786	79
<i>Ephedra gerardiana</i> Wall	68/70 = 0.971	97
<i>Pinus gerardiana</i> Wall.	65/70 = 0.929	93
<i>Pinus roxburghii</i> Sargent	66/70 = 0.943	94
<i>Pinus wallichiana</i> A.B.Jackson.	66/70 = 0.943	94
<i>Taxus wallichiana</i> Zucc	60/70 = 0.857	86
<i>Thuja occidentalis</i>	33/70 = 0.471	47
<i>Picea smithiana</i> (Wall) Bois.	35/70 = 0.500	50

A number of studies have been conducted on the ethnobotanically important gymnosperm flora from different regions of Pakistan. [2] collected the ethno botanical data of 12 gymnosperms from Kaghan Valley. [3] studied the gymnosperms of Kashmir Himalaya. [1] worked on ethnobotanical research project in the Galliyat areas of KPK province and reported 40 plants in which 5 were belonging to gymnosperms while the rest to angiosperms mostly used for medicinal, timber and food purposes. [4] visited and collected ethno botanical data of Haramosh and Bugrote Valleys in Gilgit of Northern areas of Pakistan, and reported 48 species of trees and herbs. Out of 48, there are 8 species of gymnosperms like *Pinus gerardiana*, *Picea smithiana* and *Ephedra gerardiana* etc. According to them, women of the area use medicinal plant resources for different ailments mainly digestive complaints, stomach problems, fevers, liver complaints, diabetes, children diseases and birth related problems. [5] described 11 species of Gymnosperms located at the Dir Kohistan valleys Pakistan. He also described medicinal and economic uses of these plants. It is reported that most of the Gymnosperms species are effective in curing various diseases like asthma, fever and syphilis etc. Similarly [15] conducted ethnobotanical study of wild medicinal plants of Neelum valley, Azad Jammu and Kashmir, Pakistan.

In the present research work it was found that the people of the Razmak use these plant resources for various ailments. They collect plants for medicinal uses, fuel wood, fodder, timber, and many other purposes. They prepare the recipes through personal experience and ancestral prescription from same plants or mixed with other plants. These recipes are taken in the form of fresh, powder or in paste form. The powder form may be taken with water or milk. Certain plant species are poisonous and causes various diseases in man, livestock and fishes. Some of these plants causes allergy in human. A large number of plant species are used as fodder for livestock. These fodder species are used both in fresh and dried form. The local people use many plant species as fuel wood for cooking and heat during winter. Due to lack of facilities in the area, the local people construct their houses from stones and clay and use certain plant species for timber upon which thatching and sheltering plant species are kept to support the roof. The detail study is as under.

1: *Abies pindrow* Royle

Vernacular Names: In English it is called Himalayan silver fir, Paludar and Rewar in Hindko, Ghair sarup in local pashtu.

Distribution: It is naturally present in Kaghan, Dir, Swat, Hazara, Murree, and Kashmir and in Razmak forests. Generally available at varying altitude from 7000 ft to 11000ft.

Occurrence: Sarpunga forest.

Flowering Season: April – May.

Morphological description:

Abies pindrow is an ever green tall tree which is generally resemble like a cypress. It is about 40-60m tall and 2-2.5m its trunk diameter. The trunk is straight and tapering. The stem is of grayish pink, smooth and glabrous. The Leaves are about 49cm long, flattened in cross section,, dark green, shiny and occurs in a linear row. The plant is monoecious.

The mature cones are cylindrical-conic, 7-14cm long and 3-4cm broad, dark purple when young, disintegrating when mature to release the seeds 5-7months after pollination.

Parts used: leaves and trunk.

Ethno botanical View:

1. Decoction made from dried leaves is useful in case of asthma, catarrh, cough and other pulmonary affections.
2. While the juice made from its fresh leaves is administered in a fever of infants during dentition and chest infection. About 5-10drops is added in water or mothers milk.
3. Wood is used for construction purposes like doors, windows. Wood is also used as a fuel wood.

2: *Araucaria columnaris* R.Br

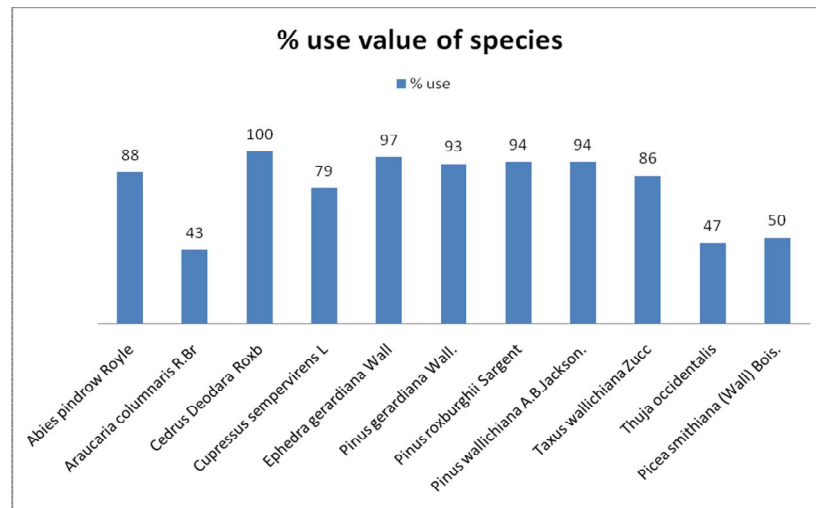
Vernacular Name: Araucaria cookie, araucaria excelsa, cooks pine.

Distribution: It is the most common Araucaria spp in Hawaii. Usually, it is cultivated but in some areas it is naturalized.

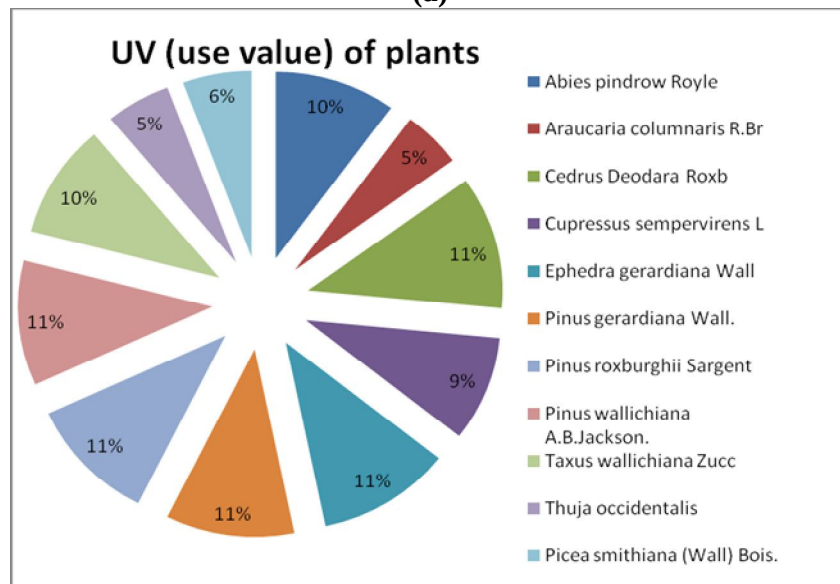
Occurrence: Cultivated every where in the research area for ornamental purposes.

Morphological description:

It is an evergreen, narrow, conical tree about 60m tall but usually very small. At early stage, trunk is clear but arise a numerous short shoots later on it. Bark grey in color and ex-foliating. Branches are cord-like, horizontal and in one plane, 9-10 cm in diameter.



(a)



(b)

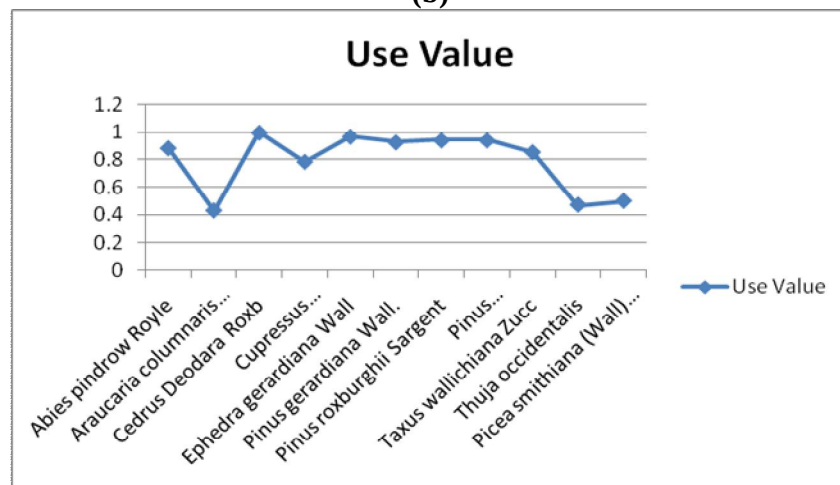


Fig1.a,b,c: Graphic representation of Uses of medicinal gymnosperm

View of the Study area along with collected gymnosperms*Abies pindrow* **Royle***Araucaria columnaris* **R.Br***Cedrus Deodara* **Roxb***Cupressus sempervirens* **L***Ephedra gerardiana* **Wall***Pinus gerardiana* **Wall***Pinus roxburghii* **Sargent***Pinus wallichiana* **Jackson***Taxus wallichiana* **Zucc***Thuja occidentalis**Picea smithiana* **Bois**

The young leaves are imbricate, needle-like, apex incurved, green, spirally arranged, 4-7mm long and 2-3mm wide. Adult leaves are scale-like and triangular. The male cones are oblong-cylindrical, smaller, scaly, numerous in number, 5-10cm long and occurs at the tips of the

branches while female cones are scaly, egg-shaped, 10-15cm long and 7-11cm wide. Seeds are 3-3.5cm long and winged with epigeal germination.

Parts used: whole plant.

Ethno botanical View:

1. Cultivated for ornamental purposes in Banglows and gardens.
2. Widely grown in parks and large gardens as ornamental tree.
3. Branches and leaves are used as fuel.

3: *Cedrus Deodara* (Roxb, ex lamb) G.Don.

Vernacular Names: It is called Himalayan cedar in English, Deodar in Urdu, Diar in Hindko, Paludar in upper Kaghan and locally called Qimati sarup.

Distribution: Chitral, Swat, Hazara, Murree Hills, Chitral, Kashmir, Kaghan and Razmak. Generally present at altitude 1220 to 3050 m.

Occurrence: Sarpunga forest.

Morphological description:

It is an ever green coniferous tall tree 40-50m tall tree, exceptionally 60m with a trunk 3m in diameter. It has a conic appearance. The leaves are needle like, 2.5-5cm long, sometimes gains a size of 7cm long slender bright green, 1mm thick, born singly on long shoots and dense cluster of 20-30 on short stem.

The females cone are barreled-shaped, 7-13cm long and 5-9cm broad, mature and disintegrate in 12 months to release the winged seeds while the male cones are 4-6cm long and shed their pollens in autumn.

Parts used: Whole plant.

Ethno botanical View:

1. It is the national tree of Pakistan.
2. Powder made from bark is used in small quantity as astringent, in diarrhea and dysentery.
3. The wood is broken into small pieces and boiled in water till the dark colored oil or turpentine is obtained.
4. The dark oil is quite helpful in protecting cattle from lice, mosquito and other insects.
5. The dark oil is also useful in ulcers and skin diseases in cattle.
6. Its wood has a special odour due to which it is used as a snake repellent.
7. Due to its characteristic features, termites usually leave it alone.
8. Being of its durability it is a valuable timber in our mountains and are used in door, window frames, and construction.
9. In Hindu religion the tree is sacred and often planted near temples and plays an important role in different religious activities.
10. Widely grown in parks and large gardens as ornamental tree.
11. Branches and leaves are used in fire burning.

4: *Cupressus sempervirens* L.

Vernacular Names: Graveyard Cypress in English, Saro in Urdu, Punjabi, Hindko, local.

Distribution: Cultivated not wildy present.

Occurrence: Cultivated both in Plain and lower hills up to 1200 meters.

Morphological description:

The word sempervirens comes the Latin word means evergreen. It is a medium sized coniferous evergreen tree about 35m tall. Its age is usually very long, some trees are reported to be more than 1000 years old. The oldest known cypress having 4000years age is present in Abarqu, Iran. The young foliage leaves are blue-green in color but becoming dark green with age. The leaves are scale-like, 2-5mm long. The plant body is monoecious. The cones are ovoid or oblong, 25-40mm long, with 10-14 scales, green at first but become brown at maturity. The male cones are 3-5mm long. It is more susceptible to fungus seiridium cardinals and cause cypress canker.

Parts used: Wood and leaves.

Ethno botanical View:

1. The fruit is anthelmantic and astringent.
2. Due to its hard nature, its wood is used in carpentry and building purposes.
3. Pollen grain causes hay fever.
4. Planted in gardens and bang laws as ornamental tree.
5. Due to its fragrant wood, in Europe, especially, Italy, it is used in family cloth chests to avoid insects' attacks.

5: *Ephedra gerardiana* Wall.

Vernacular Names: Asmani Booti in Hindko, Asmania in Urdu, and Hindko, Chewa in Urdu, Cheldymb in Kashmiri. And locally it is called Muwa.

Distribution: South Waziristan, Razmak, Chitral, Swat, Kalam, Gilgit, Baltistan, Ladak, Kashmir, Upper Kaghan Valley. It is generally present from 1600 to 4550 metres.

Occurrence: Sarpunga and Namrezye forests.

Flowering Season: May – July.

Morphological description:

Ephedra is a genus of gymnosperm shrubs, the only genus in its family, Ephedraceae, and order, Ephedrales. The plant body of *Ephedra jerardiana* is small, woody, much branched and shrubby. Its height is about 2meters.its branches are small, green and bear scale like leaves which are arranged in pairs at the node. Leaves are arranged oppositely and form a small basal sheath and show parallel venation and non photosynthetic. Branches resemble externally like equisetum and arise in axial of scale leaves. The roots have a xerophytes nature which is long and tape root. The plant body is sporophytic and reproductive organs are strobili which are unisexual. Strobili resemble to spike inflorescence of angiosperms.

Parts used: Whole plant.

Ethno botanical View:

- Ephedrine is obtained from ephedrine, which is used in treatment of cough and other respiratory disorders(in Australia ephedrine is scheduled like a heroine and its import is also customly prohibited)
- Total amount of alkaloids in ephedra jerardiana is about 1-2.5% (A.R Daar)
- The rhizomes and branches provides fuel and used for burning purposes.
- Ash of roots is used for healing of wounds and injuries.
- Stem and roots decoction is used as remedy of syphilis and stomach disorders.
- Stem powder is mixed with tobacco and used for special quality of naswar.
- Its stem juice is used as blood purifier and cleaning of teeth.

6. *Pinus gerardiana* Wall.

Vernacular name: It is called Chalghoza in Urdu, Pine in English and Zanghozai in Local.

Distribution: North-West Himalaya, Eastern Afghanistan, North-West India.

It is also present in South Waziristan Agency, Razmak, Khaderkhel and Maddakhel areas of NWA. naturally occurs at the elevation between 1800 to 3350m

Occurrence: Sarpunga and Namrezye forests.

Flowering season: April and May.

Morphological description:

It is an evergreen tall tree attaining fairly good height about 10-20m tall. The main stem is erect, woody, un-branched and covered by scaly bark. The plant body is excurrent. Branches arises away from the earth and it has two types; branches of unlimited and limited growth. The unlimited growth branches are long and bears only scale leaves. While the limited growth branches are dwarf and it contains scale and foliage leaves. The main stem is woody, un-branched and covered by a thick bark. Branches produce above the ground in such a manner that the plant gains a cone like appearance. There are also present two types of leaves, Scale leaves and Foliage leaves. Male cones are smaller and towards the apex while female cones are at the base. The male cones are produced in the middle of March or in April while female cones are produced in May. Mature female cones are large, woody and contain bract scales and ovuliferous scales.

Parts used: Cones, seed and wood.

Ethno botanical View:

- Seeds are edible.
- Used in making terraces.
- A matter called resin is obtained from its wounded stem which is applied on cleaning of human wounds.
- Cultivated in homes for ornamental purposes.
- Its ash is applied on clothes which are affected due to their resin. Its ash is a good remover of resin.
- Cones are used for decorative purposes in homes.
- Wood is used construction and for fire burning.
- A source of earning money for the local inhabitants.

7. *Pinus roxburghii* Sargent.

Vernacular Names: In English it is called long leaved pine, Chirr in Hindko, Urdu and Punjabi and locally called Almanza.

Distribution: Afghanistan, lower Kaghan, Razmak and those areas where monsoon do not penetrate. It is naturally present in altitude varying from 600 to 1500 m.

Occurrence: Sarpunga forest.

Morphological description:

It is an evergreen tall tree, about 30-50m high with a 2m trunk diameter, exceptionally 3m. The bark is thick and red-brown. The leaves are slender, yellowish-green, needle-like 20-35cm long and 3 in spure. The cones are ovoid-conic, when closed; it is green 12-24cm long and 5-8cm broad at the base. But when opened, they become 9-18cm broad. The seeds are 8-9mm long, having 40mm wing and are dispersed by wind.

Parts used: wood and resin.

Ethno botanical View:

- Its resin locally called Bethi zghla is used as stomachic, burning of body, ulceration, constipation, externally applied as a plaster on wounds and as remedy for gonorrhea.
- The oil has irritant action; in controlled small doses used in chronic bronchitis.
- The timber is used in house building, furniture, and match industry and sports goods.
- Dried leaves are used in room roof
- The resinous wood obtained from its stem centre, is used for lighting.
- Small pieces of its bark are used by blacksmiths for heating of irons.
- Cones are used for decoration
- Seed is used as food by the local peoples.
- Its wood is also used as a fuel in a winter.
- It is grown for ornamental purposes and to stop erosion.

8. *Pinus wallichiana* A.B.Jackson.

Vernacular Names:

Blue pine in English, Biar and Kail in Hindko, kairo in Urdu and Cheenar in local.

Distribution: Himalaya, Karakorum, Razmak, chitral, Murree, Kaghan, Swat, Dir and Azad Kashmir, Typical habitats are mountain screens and glacier forelands but also form mixed forests with *Cedrus deodara*, *Abies pindrow*, *P.jerdiana* and *Picea smthiana*.

Some times, it is also present at the tree line. Generally present at altitude from 1200 to 3600m.

Occurrence: Sarpunga forest.

Flowering Season: April – June.

Morphological description:

The plant body is a tall ever green tree. Main stem is unbranched , erect, woody and covered with rugged scaly bark. The branches arise away from the ground on the main stem in regular manner and form excurrent. There are two types of branches i.e unlimited and limited growth branches. The branches of unlimited growth are long and grow indefinitely by an apical bud. While the branches of limited growth are dwarf and have a number of imbricated scale leaves. Leaves are also two types; Scale and foliage leaves. The cones are long and slender 16-32cm and yellow buff when mature. The seeds are 5-6mm long with a 2-30mm wing.

Parts used: wood and leaves.

Ethno botanical View:

- Though it is a good source of fuel but it gives off a high pungent resinous smoke, so it is only used as a helping material in start of burning.
- Its leaves and cones are large, seems very attractive, relatively high resistant to air pollution as compare to other conifers due to which it is a popular tree for planting in parks and large gardens.
- It is a good source of commercial turpentine. Its turpentine is a good quality than that of *P.roxburghii*.
- Dried cones are used for decoration in houses.
- The leaves are antiseptic and sedative, its tea is used in bronchitis, high cough and asthma.

- A dark brown, viscous and sticky substance called Runzra is obtained. Runzra is applied on their legs and arms by the local people to repel insects especially mosquitoes, night time in summer.
- Its timber is very useful in buildings, furniture, bridges and terraces.

9: *Taxus wallichiana* Zucc.

Vernacular Name: Yew in English, Birmi in Punjabi and Hindko, Bunya in pushtu)

Distribution: Kurram, Chitral, Hazara, Dir, Swat, Kashmir and Razmak. Occurs at altitude from 2000m to 3500m.

Occurrence: Sarpunga forest.

Morphological description:

It is an evergreen, medium sized tree which attain a height of 15-20m. Plant body can easily differentiate into roots, stem and leaves. Stem is erect, thick and branched while root is a tap-root. The body is columnar i.e. from the main stem, branches arises few meters above from the soil. The stem is surrounded by a brown color bark. The branches are not dimorphic and they are mostly of un-limited growth. The leaves are only one kind and scale leaves are absent while foliage leaves are 2-3cm long, 2mm broad, unicostate, dark green and narrow. The upper surfaces of leaves are shining while the lower surface is pale. The leaf has a small stalk, acuminate silica especially at the tips which is sharp pointed. Due to this feature, *T.wallichiana* is not suitable for cattle because the sharp ends damaged their stomach.

Parts used: Wood leaves and cones.

Ethno botanical View:

- As it is more resistant to rotting due to their tough nature it is used in construction and furniture making.
- The peoples roast their arils not their seed in salt which is delicious and used in intervals. They have the concept that it is resistant to cancer. Modern research has shown that the stem of *T.wallichiana* contain substance taxol which has exciting potential as an anti-cancer drug especially the ovarian cancer.
- Dry stem and branches are used for fire burning purposes.
- The decoction of bark is used to treat fever and relieve muscular pain.

10: *Thuja occidentalis*

Vernacular Names: Thuja (English), More Pankh (Urdu, Punjabi, Hindko).

Distribution: Native to China, West Virginia and Japan. Commonly cultivated in plains and lower hills.

Occurrence: Commonly planted as ornamental.

Flowering Season: February - March.

Morphological description:

It was first described by Carolus Linnaeus in 1753. It is an evergreen coniferous small tree about 10 to 20 m high and 0.4m its trunk diameter .The bark is red-brown, furrowed and peels in narrow. The foliage is a scale-like leaves, 3 to 5mm long. The cones are slender, brown, 10 to 15mm long and 4 to 5mm broad with 6 to 8 overlapping scales. Larying may occur at the times of tree falls on ground.

Parts used: Whole plant.

Ethno botanical View:

- Mostly cultivated as ornamental tree in guesthouses and in parks.
- Its wood is used in construction.
- The leaves contain much amount of vit-c and are used in scurvy.
- The essential oil present in it is used in rooms spray, soft soap and as insecticides.

11: *Picea smithiana* (Wall) Bois.

Vernacular Names: Himalayan Spruce in English, Kachhal in Hindko, Khar sarup in local.

Distribution: Kurram, Dir, Chitral, Swat, Gilgit, Kaghan, Razmak, rare in the Murree hills. A few at Nathia Gali but Common in Kashmir. Naturally grown at altitude 2000 to 3300 m.

Occurrence: Sarpunga forest.

Flowering Season: April – May.

Morphological description:

It is a large ever-green tree, 40 to 55m tall and 1to 2m thick trunk. It has level branches and attains conical shape. The roots are pale buff-brown and hairless. The leaves are needle like, about 3 to 5 cm long, rhombic in cross-action and green in color the cones are broad, cylindric-conic, about 9 to 16cm long and 3cm broad, green when young but become buff-brown 5 to 6cm broad when mature.

Parts used: whole tree.

Ethno botanical View:

- Oleo resin is obtained from it which is used on heel, cracks and wounds.
- Largely used for furniture making
- Its dried cones are used for ornamental purposes in houses.
- Exported to other parts.
- For house buildings especially in hills.
- Used in burning purposes.

RECOMMENDATIONS

As there is no specific rules and regulation in Razmak due to which indiscriminate cuttings of forest have been started. People are busy round the year in cuttings. Some time, there are some restrictions/banned from local nation which is called Teengha. Inspite, destrutions are started rapidly and there is no specific solution of it. If this process continues then no plant especially Gymnosperms will remain in the area. For relieving pressure and avoid deforestation, following suggestions are recommended:

- There should be a complete ban on cutting rare species of Gymnosperms.
- To decrease depend on forest, Govt; should introduce natural gas, if not feasible then liquid petroleum gas (L.P.G) should provide in low price for the local community.
- People should aware about the negative aspects of forest destruction (deforestation) because mostly, the people are ignorant.
- Govt: should encourage local community to grow more and more trees therefore A-forestation projects should be launched by the Govt and by the local people.
- People should not use forest for earning of money. For this, Govt; has a duty to make factories in concerned area and thus problem will solve up to some extent.

- As old trees are more susceptible for pathogens and other diseases like Die-back etc. Therefore, it should be replaced by planting of new one.

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REFERENCES

1. Muhammad Arshad and Mushtaq Ahmad. 2004. Ethnobotanical study of Galliyat for botanical demography and bio-ecological diversification, 3-17.
2. Manzoor Hussein, Ghulam Mujtabashah and Mir Ajab khan. 2006, Traditional medicinal and economic uses of Gymnosperms of Kaghan valley, Pakistan. *Ethnobotanical leaflets* 10: 72-81.
3. A.R. Dar and G.H. Dar. 2006. The wealth of Kashmir Himalaya gymnosperms. *Asian journal of plant sciences* 5(2): 251-259.
4. Sher wali khan and Surayya Khatoon. 2007. Ethnobotanical studies on useful Trees and Shrubs of Haramosh and Bugrote Valleys in Gilgit Northern areas of Pakistan. *Pak, J. Bot*, 39(3): 699-710.
5. Guljan, Mir Ajab khan and Farzana Jan, 2009, Traditional, Medicinal and economic uses of Gymnosperms of Dir Kohistan valleys, NWFP, Pakistan. *Ethnobotanical leaflets* 13:1509-21, 5-12.
6. Lalit M, Tewari, Jeewan singh, Jalal, Sanjay Kumar, Y.P.S Pangtey and Rupesh Kumar, 2010, Wild and exotic gymnosperms of Uttarakhand, central Himalaya India. 33-35.
7. Faizul Haq, Habib Ahmad, Rahat Ullah, Zafar Iqbal. 2012. Species Diversity and Ethno Botanical Classes of the Flora of Allai Valley District Battagram Pakistan. *International Journal of Plant Research*. 2(4): 111-123.
8. Shonali chaturvedi and Saily Dass. 2011. Traditional, medicinal and economic uses of gymnosperms Himalayas from Ladak Eastward to Khasi, Javantia and Naga hills. 71-72.
9. Nasrullah khan, Moinuddin Ahmad, Ajaz Ahmad, S.S.Shaukat, Muhammad Wahab, Muhammad Ajaib, Muhammad Faheem Siddiqui and Muhammad Nasir. 2011. Important medicinal plants of Chitral Gol National Park (CGNP) Pakistan. *Pak. J. Bot.*, 43(2): 797-809.
10. Adeel Mahmood, Aqeel Mahmood, Ishrat Naveed, Mazhar Mustafa Memon, Hadi Bux, M.Younas Majeed, Ghulam Mujtaba and M. Saqlain Mumtaz, 2011. Indigenous medicinal knowledge of common plants used by local people of Hattian Bala District, Azad Jammu and Kashmir (AJK), Pakistan. *Journal of Medicinal Plants Research* Vol. 5(23), pp. 5517-5521.
11. Nasir, E. and S.I. Ali. 1971-2007. Flora of West Pakistan Department of Botany, University of Karachi, Karachi.
12. Ali, S.I. and M. Qaiser. (Eds.). 1993-2009. Flora of Pak., No. 194-217. Islamabad, Karachi.

13. Stewart, R.R. 1972. Annotated catalogue of vascular plants in West Pakistan and Kashmir. Fakhri Printing Press, Karachi.
14. Ali, S.I. and Y.J. Nasir. (Eds.). 1990-1992. Flora of Pak., No. 191-193. Karachi and Islamabad.
15. Qamar zaman Qamar, 2010. Ethno botanical study of wild medicinal plants of Neelum valley, Azad Jammu and Kashmir, Pakistan. Pakistan J. wildl. vol.1 (1): 25-30.