ETHNOBOTANY OF *JUNIPERUS EXCELSA* IN ZIARAT, BALOCHISTAN, PAKISTAN

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Abstract

Ethnobotanical data of *Juniperus excelsa* M. Bieb. in Balochistan is documented from various historical, literary, linguistic and pharmacological view points. Field trips were conducted to different habitats of *J .excelsa* in Balochistan during 2009-2010 to collect ethnobotanical information about this plant. The present study reveals that *J. excelsa* is considered as a multi-purpose tree use as medicine traditionally by indigenous people of Balochistan. Different parts such as fruits, leaves, stems and barks are used for curing of cough, cold, stomach cramps, asthma, diuretic, carminative, stimulant, dropsy, gonorrhea, gleets, leucorrhoea and skin diseases. Oil from Juniper berries is used in several pharmaceutical products, cosmetic industry and as a popular flavoring agent for gin. The second most used part of the tree is its wood as fuel as they need domestic energy during winter season. Data of hundreds of respondents depicted that 24% of people extracting timber from juniper forest for constructional purposes. Around 90% obtained fuel wood, 43% were grazers while 45% debarked the juniper trees for thatching the roofs. Almost 53% obtained medicinal plants. Similarly 15% obtained fencing material for agriculture field and hedges of sheepfolds, 15% were involved in collection of humus to increase soil fertility, 10% used young poles of juniper for graveyards while 7% enjoyed recreation and wild life of the forest. It is suggested that such indigenous practices on utilization of plant resources should be documented and preserved before they disappear for future generations and studies. The present study aims to know better understanding of the traditional knowledge of rural people of Balochistan about *J. excelsa*.

Introduction

Juniperus L. (Cupressaceae) is a genus of evergreen shrubs or trees and the second most diverse group of the conifers, with some 67 species in the world occurring from sea level to above the tree-line (Adams 2004). According to *Nasir et al 1976 and* Farjon *et al* 2000 this genus is represented by five species in Pakistan namely *J. excelsa, J. communis, J. squemata, J. turkistanica and J. wallichiana.* However first two species are widely distributed in Pakistan in which 2nd species grow in prostrate form at higher elevation. Junipers are extremely slow growing and long-lived trees which sometimes live more than 2000 years therefore, often termed as living forest fossil. It is taxonomically the most difficult and the most common juniper species in Balochistan province, Pakistan. It is also found in northern parts of Pakistan particularly in Chitral, Astore, Karakrkurm and the northern Himalayas regions of Pakistan on higher elevations. Now its distribution is confined comparatively to a small area. The species here in Balochistan is called *Juniperus excelsa*. Baluchistan has one of the largest remaining tracks of pure *J. excelsa* forests in the world that has global significance. They encompass an area approximately 141,000 hectares between elevations 2000- 3000 m in almost pure forms while in somewhat moist locations *Fraxinus xanthozoiledus* also appears as a second tree species which is very rare and found along the streams beds (Baig, 1966) *J. excelsa* survives in harsh climatic conditions on the arid mountains of Balochistan, and is considered as a unique precursor tree species in such habitats. The most extensive (100,000 hectares) and the best known examples are found in the Ziarat and Zarghun range near Quetta. The other big blocks of juniper forests are in Herboi hills of Kalat district. Most of the juniper forests have open canopy and can attain a height of 20 m. It is a sensitive species which has the ability to grow on shallow and stony soils in severe environments (Fisher *et al.* 1997). Juniper usually forms open and pure forests on Calcareous sandy clay loams with annual precipitation recorded around 250 mm (Ali, 1996; Ahmed, *et al*. 1990). The purpose of study was to gather ethobotanical use of *Juniperus excelsa* from Balochistan area.

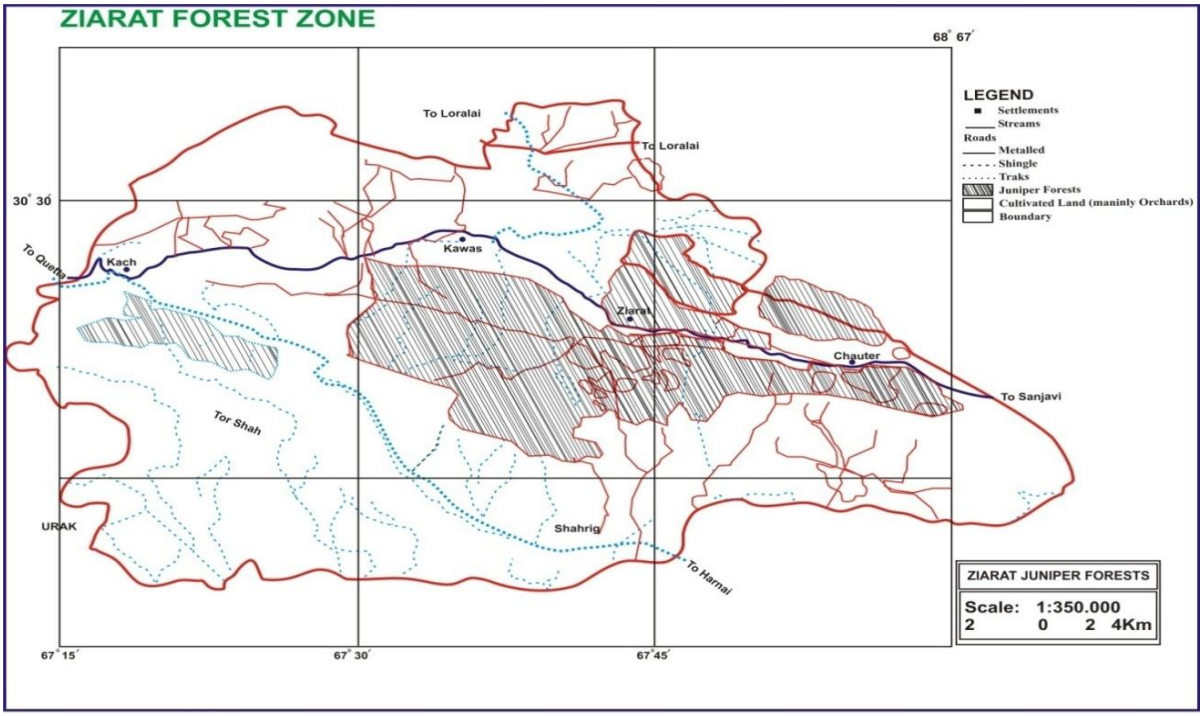

Fig. 1. Distribution of *Juniperus excelsa* in Balochistan. Shaded are juniper forests.

Materials and Methods

Several field trips were conducted to different parts of Balochistan during 2006-2010 to document the human interactions with *J.excelsa*. Members of local communities in Balochistan have been using different parts of *J. excesla* for different purposes for a long time. Ziarat, Chautair, Sassnamana,Chasnak, Zindra, Kawas Werchom, Kan, Sureghund, Rodmullazai, Zarghune mountains, Toregher and Herboi areas were among the surveyed regions which are home to *J. excelsa* populations. (Figure.1). These areas are inhabited by the Sarangzai, Panizai, Sanerzai, Sehzai Tarens, Dutani, Shawani, Badeni and Bravehi ethnic communities. In each area most knowledgeable, elderly and experienced persons were selected which were shepherds and traditional healers, Hakems or Pansars in visited regions and hundreds of people were interviewed. An open- ended interview with a questionnaire was used to document ethnobotanical data. Local names, medicinal uses, mode of administration for treating human ailments along with other specific uses were recorded in the questioner sheets and summarized in the laboratory.

Results and Discussion

Juniperus excelsa has a variety of local names in different parts of Balochistan. The most widely known names are Sanober in Urdu, Obusht in Pashtu and Apurse in Bravi. At Susnamana, Surghound Chauteer and Wahan it is called Obusht, Chasnak, Sanober and at Wahan it is familiar as "Apurse". The Juniper forest communities have been fulfilling a variety of their requirements from plant species found in Balochistan and in adjoining areas specially the local traditional healers such as Hakims, Pansars, Homeopathic doctors. The documented plant part uses are summarized in Table 1.

The results of this study reveal that *J. excelsa* is widely used in Balochistan, province of Pakistan. It is interestingly considered as a living forest fossil and highly respected by some indigenous communities. The plant is used both medicinally and non-medicinally by the local inhabitants of the studied regions.

The most common use of the tree concerns its wood as fueal and construction purposes. Gum is used mainly for medicinal purposes such as relieving pains. However, the main medicinal part of the tree is the female cone with a relatively wide application in traditions and practices related to curing different health problems. Leaves are sometimes used for incense and producing natural die. Similar ethnobotanical uses have been reported for *J. excelsa* in the adjacent countries. It has been a source of timber and fire in Turkey

Fig.2. Wall of Juniper cut-stems around traditional house

Fig.3. Cavities or ditches in the trunk of juniper tree to store water for their animals

Fig.4. Poles for graveyards and embankments

Fig.5. Debarking of juniper trunks for thatching of hutments

Fig.6. Embankments to protect their apple orchards from floods

Fig.7. Illegal cutting of Juniper for fuel wood

Fig.8. Juniper used in Karez system to flow out the mountain water

(Kargioğlu *et al*. 2010, Walikhan & Khatoon 2007). The tree is used as an antiseptic and parasiticide for animals in Turkey (Bonet & Valles, 2007). Similarly, the same use is reported from Isfahan province by Assadi *et al*, (1998). Muhammad *et al*. (1992) reported antibacterial diterpenes from leaves and seeds of *J. excelsa*. His observation confirms the traditional application of the leaves as an anti-bacterial and parasiticide.

Table 1. Summary of Ethnobotanical uses of various parts of *Juniper* tree in Balochistan.

Parts used	Traditional/Medicinal uses
Leaves	Leaf infusion is used for, stomach ache, cardiac and nervous problems and also used as a natural dye.
Bark	Barks are used for thatching huts as they have water proof quality.
Branches	Stem and branches are used as fencing material for agriculture fields, hedges for sheep holds, wall plates, walking sticks and as embankments.
Female cones	Cones used for treating urinary problems as a diuretic, carminative, stimulant, dropsy, gonorrhea, gleets, and leucorrhoea and skin diseases. Incense-natural die.
Oil of Barries	Pharmaceutical, cosmetic product, flavoring agents for ghi and food.
Gum	Gum is used to treat toothaches, as anti-bacterial, anti-parasite.
Honey	Natural honey is used as medicine, food and religiously considered holy and useful against diseases.
Wood	Wood is used as fuel, beam, charcoal and used for making pencils.
Stumps	Embankments to protect their orchards against heavy flood.

In addition to Chitral, Astore and Karakurum valleys, use of female cones for digestive problems is common in different parts of Pakistan, where they are considered as carminative and used against stomach cramps (Baqar 1989, Hussain *et al*. 2006). Female cones for treating problems of urinary system is widespread in Pakistan as well as some parts of Afghanistan. Indigenous people of Pakistan use the cones for treating urinary problems, kidney stones and bladder weakness (Walikhan & Khatoon 2007). The cones are used in Iran and Pakistan for their diuretic and stimulant properties (Baqar 1989, Djavanshir 2003, Hooper & Field 1937, Parsa 1960). They are also used in treating gonorrhoea (Baqar 1989, Djavanshir 2003). There are other therapeutic effects reported for female cones in folk medicine of Pakistan. Mature female cones are taken orally to relieve headache and fever (Goodman & Ghafoor 1992). Cones are applied for treating skin diseases, diabetes and different respiratory problems such as asthma and tuberculosis Baqar 1989, Hussain *et al*. 2006, Qureshi *et al*. 2006. The paste of cones is applied on painful joints and swellings (Qureshi *et al*. 2006); and they have been mentioned in treating dropsy, gleets, leucorrhoea (Baqar 1989). Ash of wood and leaves is sometimes applied for treating certain skin infections (Walikhan & Khatoon 2007).

The second most used part of the tree is its wood as fuel as they need for domestic energy during winter season. Data of 96 respondents depicted that 24% of people extracting timber from juniper forest for constructional purposes. Around 90% obtained fuel wood, 43% were grazers while 45% debarked the juniper trees for thatching their roofs. Almost 53% obtained medicinal plants as per requirement. Similarly 15% obtained fencing material for agriculture field and hedges of sheepfolds, 15% were involved in collection of humus for improvement of the soil fertility, 9% used selective felling of young poles of juniper for graveyards while 7% enjoyed recreation and wild life of forest.

Conclusions

The present study concluded that *J.excelsa* is extensively used by indigenous people in Balochistan for different purposes. Such utilization of plant resources should be documented and preserved before they disappear for future generations. In addition, this huge utilization indicates an alarming rate of thinning out of this rare species. Therefore it needs urgent conservation, sustainable use and alternate resources on subsidiary basis in order to protect this unique forest ecosystem.

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