

Traditional and Ethnomedicinal uses of some grasses (Poaceae) of Kinnaur, Himachal Pradesh, India.

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Abstract: Himachal Pradesh, a part of Western Himalaya, is a repository of medicinal and aromatic plants and the traditional knowledge associated with these plants. The people living in remote and tribal areas still depend on household remedies for healthcare. The Kinnaur district inhabited by tribal community known as Kannaure, have a great respect for and faith in Amchi system of medicine. Various localities were visited during May 2011 to September 2014 and ethnobotanical information was collected through interviews with elderly people, women, shepherds and local amchi, to highlight the traditional use of medicinal grasses by the native people. The present paper provides information on the medicinal uses and other traditional uses of 20 wild species of grasses belonging to family Poaceae. The present study contributes significant ethnobotanical information about grasses from this remote high altitude and difficult region of the World, which remains snowbound and cut off from the rest of the World for 5-6 months due to heavy snow fall.

Key words: Ethnomedicine, Medicinal grasses, Kannaure tribe, Himachal Pradesh.

Introduction

Himachal Pradesh, which forms a part of the Western Himalaya, having climatic conditions ranging from semitropical to temperate, is a repository of medicinal and aromatic plants and the traditional knowledge associated with these plants. Kinnaur represents one of the interior areas of Himachal Pradesh (30°22'40"N to 33°12' 40" N Latitude and 75°47'55" E to 79°04'20" E Longitude) which spans over an area of 6,400 km in the Western Himalayas. Kinnaur valley has a varied phytogeography and thus harbors diversity in vegetation. The district shares its boundary with Tibet and the Zaskar mountains from the International frontier between Kinnaur and Tibet. The vegetation of this region has been classified in to 29 types which belong to Himalayan moist and dry temperate forests, dry and moist alpine scrub and meadows (Champion and Seth, 1968). Most of Kinnaur enjoys a temperate climate due to high elevation with long winters and short summer. Parts of the lower valley of Kinnaur receive monsoon rains and upper valleys are very dry, situated in the rain shadow area. The alpine grasslands, usually above 3800m, remain under snow cover for 4-6 months and are remarkable for the variety of beautifully colored flowers forming a rich storehouse of medicinal and aromatic plants (Chauhan, 2003). People living in the isolated areas have developed their own way of life. The rural populations have immense faith for traditional herbs and have traditional indigenous knowledge about the use of medicinal plants to cure various ailments (Patil and Patil, 2012).

The valley is rich in high value medicinal wealth and local inhabitants (Buddhist) practice the Tibetan Amchi system of medicine. Amchi practitioners are highly respected both socially and spiritually and are believed to be the representative of Sangyas-Manla (the medicine of Buddha).

For centuries, every major village and hamlet had their own Amchi. Besides treating patients, Amchis are the most learned and resourceful persons of the village. Besides medicinal uses local inhabitants of Kinnaur have the practice to use grasses for forage due to high foliage content and for soil conservation in land slide areas. Some grasses are reported to increase the amount of milk production in cattle. Planting improved varieties of grasses will not only bind the soil but also provide a rich source of fodder for the livestock (Pandit, 2002).

Earlier preliminary observation on medicinal plants of the adjoining area of Lahul and Spiti has been made (Uniyal *et al*, 1982) and some medicinal and aromatic plants of District Kinnaur has been studied (Negi and Chauhan, 2009) but no serious attempt on ethno-botanical studies of grasses has been made. It is very essential for humans to identify such important grasses and develop a strategy for their conservation. Keeping in view, the medicinal importance of grasses among local people, the present study was undertaken to study ethnobotany of District Kinnaur.

Materials and Methods

Intensive field surveys were conducted in District Kinnaur to cover different altitudinal zones, to include all vegetation types: forests, scrubs, temperate and alpine grassland to collect information about the ethnobotanical uses of plants by the local people during snow free period of May 2011 to September 2014 (Figure 1). Local healers called Amchi and native people using medicinal plants for curing various diseases were interviewed for documenting the information in their local dialect (Kanauri). The plant specimens were dried, mounted, identified and authenticated with the help of regional floras, such as 'Flora of Himachal Pradesh'(Chowdhery and Wadhwa, 1984), 'Flora of Kullu

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District' (Dhaliwal and Sharma, 1999) and 'Flora of Sirmour District'(Kaur and Sharma, 2004), Flora of Lahaul-Spiti' (Aswal and Mehrotra, 1994) and at Forest Research Institute (FRI) Dehradun and Botanical Survey of India (BSI) Dehradun, India. Voucher specimens have been deposited in the Herbarium, Department of Botany, Punjabi University, Patiala.

Results and Discussion

This paper documented traditional uses of 20 species of grasses from the remote, interior and tribal area of District Kinnaur, a cold desert region of North Western Himalayas, which are most commonly used as medicinal plant by local folks against different ailments. The information on scientific name, local name, plant part exactly used and other ethno medicinal uses to cure various diseases have been provided in table 1.

Table 1. Ethnobotanical and Ethnomedicinal uses of some species of grasses from the remote, interior and tribal area of District Kinnaur, Himachal Pradesh.

S.No	Botanical name /Local name	Accession number (PUN)	Part used	Ethnobotanical and Ethnomedicinal uses
1	<i>Arundo domax</i> L. (Rajal)	58707	Roots/stems	Stems are used by elder peoples to make walking sticks and as support for climbing trees. Decoction of roots is used by local amchi for curing cancer.
2	<i>Avena fatua</i> L. (Yukpa)	58508	Seeds	Plant is used as forage for cattle and yaks. Roasted seeds are eaten for curing stomach disorder and in case of fever seeds are mixed with milk and boiled milk are taken.
3	<i>Calamagrostis emodensis</i> Griseb. (Shinga)	58577	Whole plant	Whole grass is used for thatching roofs and making brooms and also used for forage purposes.
4	<i>Cymbopogon distans</i> (Steud.) Wats. (Kurcha)	59166	Leaves	Plants parts are used as forage. Aromatic oils are extracted from the leaves and used in preparing amchis medicine. Oil is applied in inflammation and joint pain.
5	<i>Cynodon dactylon</i> (L.) Pers. (Changma cha)	58510	Leaves	This grass is considered as sacred and used for the worship of deity by the local people. Leaves are crushed and applied on the cut area to stop bleeding. This grass is also used for forage purposes for cows and yaks.
6	<i>Echinochloa colona</i> (L.) Link. (Gamte)	59169	Stem/Seeds	Seeds are roasted and mixed with roasted seeds of wheat and bhang and eaten by the native peoples. Stems are used in weaving mats.
7	<i>Elemsine coracana</i> L. (Danker)	58709	Stem/seeds	Grains are powdered in to fine paste and powdered paste is taken in the morning with milk or tea as it helps to strengthen bones. Whole plant is used for making baskets, mats and thatching of roofs.
8	<i>Elemsine indica</i> (L.) Gaertn. (Kangli)	58710	Whole plant	A decoction of fresh plant is used against dysentery and constipation. Whole plant is used for making ropes and mats.
9	<i>Elymus himalayanus</i> (Nevski) Tzvelev.(Soa)	59140	Leaves	Extract of leaves is used in reducing high blood pressure and to increase hemoglobin level. Straw is also used as fodder.
10	<i>Eremopoa persica</i> (Trin.) (Naema)	58694	Whole plant	Whole plant is used as good fodder. This grass mostly grown on the bank of river and its deep roots help in controlling landslides.
11	<i>Kengia mutica</i> (Keng) Packer. (Chaeve)	59170	Leaves	Leaves are dried properly and used for flavoring food products by the local inhabitants. This grass is good fodder for goats which increases milk production.
12	<i>Lolium temulentum</i> L. (luk cha)	59171	Wholeplant	Whole herb can be used for fodder and for soil erosion control. The plant is also used in the preparation of local amchi medicines.
13	<i>Melica persica</i> Kunth. (Karvo)	59584	Whole plant	This grass is ornamental and its white inflorescence and leaves are tied in a bunch and offered in the gompas for the worship of rinpoche and other religious ceremonies.
14	<i>Pennisetum lanatum</i> Klotzsch (Rampa)	58950	Seeds	Powdered grains are mixed with oil and used for reliving joint pain and tooth ache. It is grown in the edges of fields and helps in soil stabilization.
15	<i>Pbleum pratense</i> L. (Gotak)	58517	Leaves	Decoction of leaves is used for reducing asthma related problems. It is grown for cattle feed and as hay for horses.
16	<i>Phragmites communis</i> (L.) Trin. (Marvo)	59153	Roots/ stems	Stems are used in weaving mats, baskets and thatching of roofs. Roots grown deep help in soil binding.
17	<i>Setaria etalica</i> (L.) P. Beauv. (yarka cha)	59148	Seeds	Grains are powdered and one spoon of powder is taken with warm water to cure fever and headache. This grass is used by the local people as fodder to increase lactation of the cattle.
18	<i>Setaria viridis</i> Linn. (Rishing)	59152	Seeds	Seeds are powdered and mixed with mustered oil and applied externally for skin related problems and in case of inflammation.
19	<i>Sorghum belepense</i> (L.) Pers. (Pakche)	58703	Stem /seeds	Seeds are boiled and mixed with salt and given to patient to cure dysentery. Stem are used in weaving baskets and mats and in making brooms for cleaning roadsides.
20	<i>Thysanolaena maxima</i> (Roxb.) O. Kuntze.(Mendok)	58696	Whole plant	The plant is used for ornamental purposes and whole herb is used in making brooms and to feed cattle and churu.

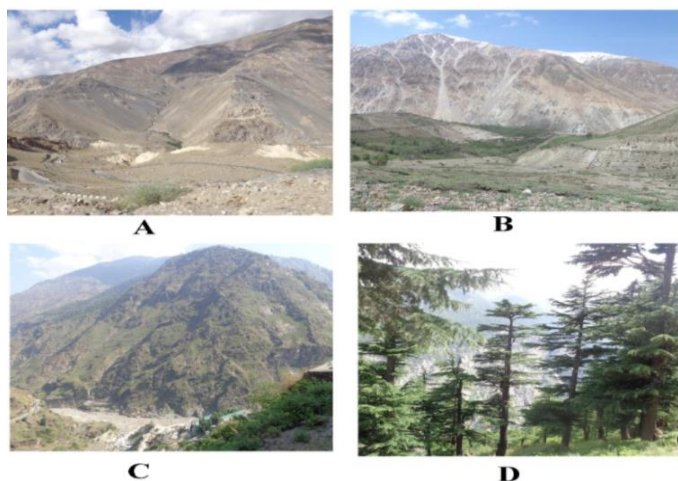


Figure 1. A. Upper Kinnaur valley near Leo with scanty vegetation. B. Hangrang valley near Hango showing agricultural fields and orchard garden. C. Bhabha valley near Nichar showing Alpine moist slopes. E. Kalpa valley showing scrub and coniferous forest.

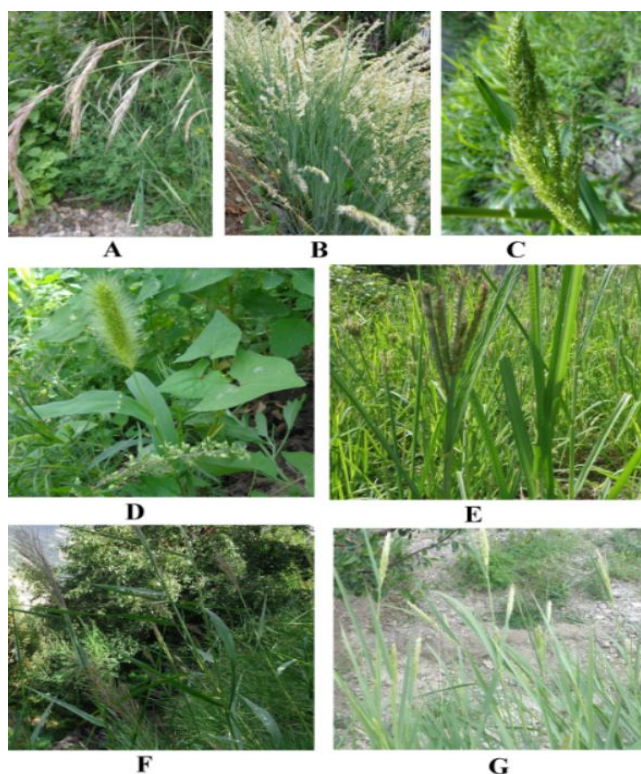


Figure 2. Photographs of some medicinal grasses used by tribals of Kinnaur, Himachal Pradesh. A. *Elymus himalayanus* (Nevski) Tzvelev. B. *Melica persica* Kunth. C. *Echinochloa colona* (L.) Link. D. *Setaria viridis* Linn. E. *Eleusine coracana* L. F. *Arundo domax* L. G. *Pennisetum lanatum* Klotzsch.

During field survey, it was noticed that elderly people compared with younger ones of tribal community, have vast treasure of hidden knowledge lying with them. A wide range of ailments like cold, cough, cuts, wounds, cancer and stomach related ailments are treated by local practitioners, which is based on amchi system of medicine, an offshoot of the Tibetan system of medicine (Brijlal *et al.*, 2001). The use of medicinal plant is prescribed in the form of paste, powder, decoction and oil. Some of the medicinal grasses

used by the tribals of Kinnaur are shown in Figure 2. Local inhabitants of the study area find that traditional medicines are cheaper as compared to the conventional medicines. Indigenous people cannot afford products of Western Pharmaceutical industries (Salie *et al.*, 1996) due to high cost, their side effects and lack of healthcare facilities. Tribal people believe in traditional medicinal system due to their greater biological compatibility with human system, lesser toxic nature and easy accessibility and have found an important place in day to day life (Plotkin and Famolare, 1992). The study revealed that lack of modern health facilities has increased the dependence of locals on plants.

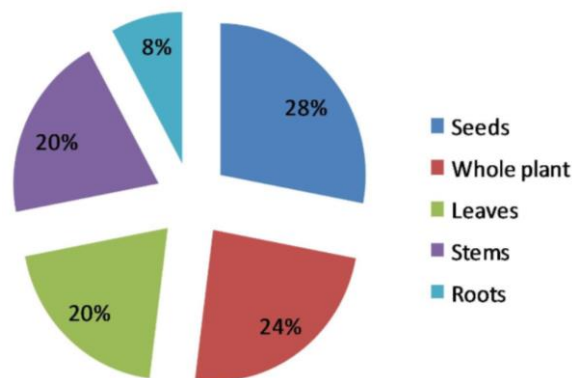


Figure 3. Percentage of different plant parts used for medicinal and other important uses.

The flora of Kinnaur has close affinities with the flora of the adjacent district of Lahaul and spiti (Aswal and Mehrotra, 1994). Most of the area under Kinnaur and Lahaul and Spiti districts has semi arid to arid climates with scanty rainfall. Majority of the older persons have sound knowledge of medicinal plants and use of these plants in their daily life. Among the plant parts, use of seeds (28%) is most common followed by whole plant (24%), leaves (20%), stems (20%) and roots (8%) (Figure 3).

Grasses have adapted to several environmental conditions like rain forests, dry deserts, cold mountain steppes, and are now the most spread plant type. Several species of grasses are cultivated for their food value. Ethnobotanical survey on grasses revealed that most of the grasses are valued as fodder and forage for cattle. Among presently surveyed grasses majority have medicinal properties (37%), these plants or their parts are useful for curing ailments followed by Fodder (32%) and others (31%). Besides their fodder and medicinal value, some grasses have various other significant uses also as; *Thysanolaena maxima* is used for ornamental purposes, *Cynodon Dactylon* and *Melica persica* are considered as sacred and are used for worshipping and offered in the Gompas especially during special ceremonies, *Kengia mutica* and *Cymbopogon distans* are used for flavoring food products, *Pennisetum lanatum* and *Eremopoa persica* are excellent soil binders, tribal peoples used to grow these grasses on the edges of their fields to control landslides. Some other important grasses like *Calamagrostis emodensis*, *Eleusine coracana*, *phragmites communis* are used in weaving mats, baskets and thatching of roofs. *Arundo donax* with its woody stem, is used by elder peoples to make walking sticks (Table 1).

From the date back to human civilization, these grasses were well accommodated with the human life; as a result man depends on the members of this group for their food, shelter, cloth and for medicine to treat their ailments.

Amchi system of medicine is gradually decreasing in Kinnaur, because new generations are not showing their interest in this art of healing. Older generations had good knowledge of plants and their identification but the coming generations do not feel like visiting the field to be trained in identification of plants. It is believed that the excessive anthropogenic activities are the main cause of decline in the populations of medicinal and aromatic plants in the Himalayan region (Samant and Palni, 2000). The fast pace of tourism in high altitudinal areas are another important factor causing the damage of biodiverse ecological system (Blangy and Mehta, 2006). It is therefore indicated that efforts should be made for the conservation and standardization of these medicinal plants.

Some of the grasses are used as food supplements, flavoring food products, beverages, and some others as fodder for cattle and in the treatment of human diseases. Certain species have cultural applications as well, being used as incense in religious ceremonies, as an insecticide in homes and storage facilities, and for the production of natural dyes. Application of grasses for the remedies from the diabetes, kidney stones, tumors, wounds, diarrhea, joint pain, cold, fever and skin related diseases are required to be screen thoroughly, both by chemical as well as pharmacological means for treatment of these diseases. This study contributes significant ethno-botanical information from the remote high altitude and difficult region, which remained cut off from rest of the world for 5-6 months. Investigation of those plants which are not explored earlier may lead to the exploration of several new drugs to various diseases from such geographically isolated and unexplored area.

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