

*Full Length Research Paper*

# Ethnomedicinal uses of grasses in Salt Range Region of Northern Pakistan

Farooq Ahmad<sup>1</sup>, Mir Ajab Khan<sup>1</sup>, Mushtaq Ahmad<sup>1</sup>, Muhammad Zafar<sup>1\*</sup>, Tariq Mahmood<sup>1</sup>, Asma Jabeen<sup>2</sup> and Sarfraz Khan Marwat<sup>1</sup>

<sup>1</sup>Department of Plant Sciences, Quaid-i-Azam University, Islamabad, Pakistan.

<sup>2</sup>Environmental Sciences Department, Fatima Jinnah Women University, Rawalpindi, Pakistan.

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Salt Range Region of the country attracts the attention of researchers to explore its floral potential throughout the history. In this context the present study was confined to explore the medicinal potential of grasses in this range in order to propose protective measures for sustainable use of Salt Range grasses for coming generations. In total 62 grass species were collected and documented from the area. Out of these 10 species of grasses were found to link with livelihood for their medicinal uses. Ethnomedicinal data was collected through structured and semi structured interviews by using questionnaires. In total of 100 informants including 50 males and females were approached to provide their precious indigenous knowledge related to ethnomedicinal uses of grasses. The study concludes that most of the inhabitants are unaware of medicinal potential of native grasses and they are deteriorating the habitat for firewood, livestock feeding and construction of roads and buildings. It is recommended that the indigenous communities should be trained to protect these grasses by using In situ strategies for long term sustainability.

**Key words:** Ethnomedicinal uses, grasses, Salt Range, Northern Pakistan.

## INTRODUCTION

Grasses constitute a natural homogenous group of plants belonging to the family Poaceae (Gramineae). Undoubtedly, Poaceae forms the most fascinating families of flowering plants, with a wide range of diversity and plays a significant role in the lives of human beings and animals (Mitra and Mukherjee, 2005). The value and culture of cereal grasses dates back to a period when man was emerging from wild beast stage (Gould, 1968). The members of this group are present in all conceivable habitats, suitable for the growth of plant communities, and in every climatic region (Mitra, 2005). In Pakistan Poaceae is one of the dominant families among

angiosperms both on the basis of its number of genera and species (Cope, 1982).

Pakistan possesses a unique position of being stretched from almost zero meters at the sea shore to the second highest peak of the world K2 (8611 m). Pakistan has a great diversity of landscapes (Figure 1). The high mountain ranges of the Hindu Kush, Himalayas and Karakorum, the snow covered peaks, eternal glaciers, the high lying cold deserts, the vast irrigated plains, the bleak hot low lying thar and thal deserts, the rocky plateaus in Sind and Baluchistan and the coastal shores provide all the possible habitats for development of plant communities (Ahmad, 2004).

Physically, the Salt Range begins in the east of Jhelum in the Tilla Jogian (Figure 2). It runs southwest to the north of for some distance before turning northwest to cross the River Indus near Kala Bagh (Ahmad, 1964). On

\*Corresponding author. E-mail: [catlacatla@hotmail.com](mailto:catlacatla@hotmail.com). Tel: 92-51-90643149.



Figure 1. Map of Pakistan.

the west of river Indus, the Salt Range continues southwards to the districts of Bannu and D.I. Khan.

Geographically, the Salt Range lies between  $32^{\circ}23' - 33^{\circ}00'$  and  $71^{\circ}30' - 73^{\circ}30'$  E in the northwest of Punjab province. Administratively, it occupies parts of the districts of Chakwal, Khushab, Jehlum and Mianwali. Average height of the range is 600 m which rises to 1525 m in Sakesar (Ahmad, 2004). Salt Range has relatively low annual precipitation, about 50 cm annually. Mostly there is rainfall in months of July, August and September. The length of winter season is long and is accompanied by frost. Summer and winter both are cooler than that of the adjoining plains (Ahmad et al., 2007). Sand stone and lime stone are the common rock types of Salt Range (Chaudhary et al., 2001). The soil in the weathered lime

stone portions forms the thin and shallow layer and is very fertile (Ahmad, 1964). It has a rich biodiversity. Perennials like *Kochia indica* weight, *Suaeda fruticosa* Forsk, *Salsola foetida* Del, *Haloxylon multiflorus* Bunge, *Herniaria hirsuta* L. and grasses like *Sporobolus arabicus* Boiss and *Cynodon dactylon* (Linn.) Pers dominate in saline soil (Ahmad, 1964, Ahmad et al., 2009 and Hameed, 2008).

*Acacia modesta* is the dominant tree species. *Dodonea viscosa*, *Justica adhatoda*, *Lantana indica*, *Lespedeza floribunda* and *Opuntia monacantha* are the dominant shrubs. *Dodonea viscosa* occupies the steep hills and is frequent where there is high soil erosion. *Dicliptera bubleoides* and *Pupalia lappacea* are the dominant herbs and grasses like *Chrysopogon serrulatus*,



study on grasses used by the local people of the area for medicinal and other purposes. The purpose of the present study is to explore the medicinal potential of Salt Range grasses for long term sustainability.

## METHODOLOGY

The present study is the outcome of the two years of critically, minute and systematic study of the grasses and their usage by local inhabitants of the area, representatives of almost all the areas of Salt Range. Two to three days field trips were arranged in every season, in 10 to 12 representative localities of the area from an ethnobotanical point of view. In autumn and winter mostly, the vegetative parts of grasses were collected and in spring and summer, grasses with floral parts were collected. 41 species of grasses were collected in summer while 12 and 9 species were collected in spring and winter respectively. Nomenclature of each taxon has been checked in the light of the rules of the International Code of Botanical Nomenclature. Identification of grasses was carried out with the help of the Flora of Pakistan (Nasir and Ali, 1970-2002).

Ethnomedicinal information was documented by structured and semi structured surveys from 100 people including 50 males and 50 females of the area. To determine the authenticity of information collected during field work, repeated verification of data from different people in different areas was done (Ahmad et al., 2009). During the survey, folk uses of grasses have come to knowledge which is not mentioned before, in previous literature. All the specimens were collected in duplicate or triplicate and were deposited with voucher number in the herbarium of Quaid-i-Azam University Islamabad Pakistan.

## RESULTS AND DISCUSSION

Ethnomedicinal uses of grasses of Salt Range of Pakistan are of considerable interest, as the economy of the area mostly depends on grasses (Ahmad, et al., 2009). As a result of this study, ethnomedicinal uses of 10 species out of 62 species (Table 1) of grasses have been reported for the first time in the area of the Salt Range.

The present study shows that grasses like *Desmostachya bipinnata*, *Eulaliopsis binnata*, *Arundo donax*, *Saccharum bengalense* and *Saccharum spontaneum* have different ethnobotanical uses in the area of Salt Range (Table 2). The inhabitants of Salt Range are unaware about the medicinal value of these grasses, as out of these grasses, two species that is, *E. binnata* and *S. spontaneum* are used as ethnoveterinary medicine, in some parts of India (Tiwari and Pande, 2006; Tomar, 2008). In Salt Range, *Cymbopogon jwarancusa*, *Cynodon dactylon*, *Setaria italica*, *Hordium vulgare* and *Desmostachya bipinnata* (Figure 1) are used for medicinal purpose (Table 3). Root decoction of *Cynodon dactylon* is given to cattle for respiratory diseases in different localities of study area, while in Kanya Kumari district of Southern India, leaves of *C. dactylon* with coconut oil are used to cure skin diseases (Kingston, et al., 2009) and in Rajasthan its aqueous extract with sugar

is given to persons suffering from nostril haemorrhage (Katewa, et al., 2001).

According to Mishra (2009), *Hordium vulgare* is used for treatment of fever in some tribes of India, while in Salt Range the flour of this species is used with water to cure jaundice. Flour of *Setaria italica* in the form of paste is given to patients suffering from chicken pox, while in Orissa (India), *S. italica* is used for various disorders (Sarin et al., 2008). Root paste of *Desmostachya bipinnata* is used against rheumatism in Soon Valley of Salt Range, while Tomer (2008), reported that its root infusion is given in jaundice and urinary troubles in Uttar Pradesh (India) and paste of whole plant is taken orally to cure dysentery in Rajasthan (India) (Katewa, et al., 2001). *Vetiveria zizanoides* is used in Pakistan to cure fever, inflammation and irritability of stomach and also used for its aromatic properties (Khan, et al., 1997), while in Tamil Nadu (India) its fruit and shoot is used for pest control (Mohapatra et al., 2009). So in different parts of India and Pakistan same species of grasses is used for different diseases. Trend of using plants for medicine is decreasing in the new generation, because ethnomedicinal knowledge is not transferred from generation to generation, so it is necessary to explore and identify the uses of grasses by older people of the area. It is observed that in remote areas where the medical and other facilities are not available, the inhabitants are more aware of the ethnomedicinal uses of grasses.

Salt Range has a diversity of grasses and there are many grass species present in the area, have medicinal properties but the local people of the area are unaware of these useful grasses and not utilized by people of the area. These species include *Heteropogon contortus* (Linn.) P. Beauv. Ex Roem. and Schult, *Eleusine indica* (Linn.) Gaertn, *Echinochloa crus-galli* (Linn.) P. Beauv., *Desmostachya bipinnata* (Linn.) Stapf, *Cenchrus ciliaris* Linn., *Dactyloctenium aegyptium* (Linn.), *Dactyloctenium scindicum* Boiss and *Cynodon dactylon* (Linn.) Pers. that have ethnomedicinal value and are used in Rajasthan (India) (Katewa, 2001). Out of these grass species only *Desmostachya bipinnata* and *Cynodon dactylon* is used medicinally in some specific localities of the Salt Range area.

The Salt Range of Pakistan which has rich floral diversity and suitable habitats for the growth of plant communities is enriched with useful medicinal plants including grasses. Due to increase in population, the clearing of forests is on the peak to meet the requirements such as fuel and shelter (Qureshi and Ahmad, 1996). *Vetiveria zizanoides* is an important medicinal grass, which is almost near extinction in the area due to deforestation (Ahmad et al., 2009), because most people of the Salt Range do not know its medicinal value. There is a need of In situ conservation of useful plant species, e.g. establishment of parks and hot spot areas. Park is established in Morgah Rawalpindi to protect the biodiversity of Pothowar region (Hussain et

**Table 1.** List of grasses collected from salt range of Pakistan.

S/No.	Botanical name / voucher number	Voucher specimen number	Flowering period
01	<i>Arundo donax</i> Linn.	121	June-December
02	<i>Pharagmites karka</i> (Retz.) Trin.ex Steud.	102	October-November
03	<i>Aristida adscensionis</i> Linn.	343	March-November
04	<i>Enneapogon persicus</i> Boiss.	362	June-August
05	<i>Acrachne racemosa</i> (Heyne ex Roem. and Schult.) ohwi	312	June-August
06	<i>Dactyloctenium aegyptium</i> (Linn.) Willd.	69	July-October
07	<i>Dactyloctenium scindicum</i> Boiss.	368	July-September
08	<i>Desmostachya bipinata</i> (Linn.) Stapf.	338	June-October
09	<i>Eleusine indica</i> (Linn.) Gaertn.	36	June-November
10	<i>Eragrostis cilianensis</i> (All.) Lut. ex F.T. Hubbard.	293	March-October
11	<i>Eragrostis papposa</i> (Roem. and Schult.) stued.	220	April-October
12	<i>Octochloa compressa</i> (Forssk.) Hilu.	326	April-September
13	<i>Sporobolus arabicus</i> Boiss.	512	February-July and August.
14	<i>Leptochloa panicea</i> Retz.	22	May-June and October
15	<i>Cynodon dactylon</i> (Linn.) Pers.	83	Mostly Mar-Nov.All year around.
16	<i>Chloris dolicostachya</i> Lag.	330	June-August
17	<i>Chloris barbata</i> Sw.	324	June-August
18	<i>Tetrapogon villosus</i> Desf.	393	March-September
19	<i>Tetrapogon cenchroides</i> (A.Rich.) Clayton.	268	March-September
20	<i>Tragus roxburghii</i> Haller.	398	May-October
21	<i>Brachiaria distachya</i> (Linn.) Stapf.	313	July-September
22	<i>Brachiaria ramosa</i> (Linn.) Stapf.	420	June-July and October
23	<i>Brachiaria reptans</i> (Linn.) Gardner and Hubbard	146	June-November
24	<i>Brachiaria eruciformis</i> (J.E.sm.) Stapf.	291	July -September
25	<i>Cenchrus ciliaris</i> Linn.	164	March - October
26	<i>Cenchrus setigerus</i> Vahl.	62	March - September
27	<i>Pennisetum Orientale</i> L.C.Rich.	224	April - November
28	<i>Digitaria sanguinalis</i> (Linn.)Scop.	392	June -September
29	<i>Digitaria nodosa</i> Parl.	327	March -September
30	<i>Echinochloa colona</i> (Linn.)Link	347	May - September
31	<i>Panicum maxim</i> Jacq.	136	June- September
32	<i>Paspalum paspaloides</i> (Michx.) scribner .	411	April-May and August-November
33	<i>Paspalidium flavidum</i> (Retz.) A. camus	354	July-October
34	<i>Setaria glauca</i> (L.) Beauv. Or <i>Setaria pumila</i> (poir.) Roem and Schult.	281	May-October
35	<i>Setaria italica</i> (Linn.) P.Beauv.	105	July-October
36	<i>Setaria verticillata</i> (Linn.) P. Beauv	335	April-October
37	<i>Setaria intermedia</i> Roem. and Schult	300	June-September
38	<i>Setaria viridis</i> (Linn.)P.Beauv.	280	May – September
39	<i>Bothriochloa bladhii</i> (Retz.)S.T.Blake	148	May – November
40	<i>Chrysopogon serrulatus</i> Trin.	12	April – September
41	<i>Dicanthium annulatum</i> (Forssk.) Stapf.	171	March-November
42	<i>Dicanthim foveolatum</i> (Del.) Roberty	360	March-September
43	<i>Eulaliopsis binata</i> (Retz.) C.E Hubbard.	274	March-July
44	<i>Heteropogon contortus</i> (Linn.) P.Beauv.ex Roem. and schult.	89	June-November
45	<i>Imperata cylindrica</i> (Linn.) Raeuschel	79	March-November
46	<i>Cymbopogon jwarancusa</i> (Jones.) Schult	58	April-November
47	<i>Sorghum halepense</i> (Linn.) Pers	56	May-October
48	<i>Saccharum bengalense</i> Retz.	63	October-January

**Table 1.** Contd.

49	<i>Saccharum. spontanium</i> Linn.	9	July - September
50	<i>Vetiveria zizanioides</i> (Linn.)	77	September
51	<i>Poa annua</i> Linn.	210	March-November
52	<i>Poa infirma</i> H.B.K.	167	March-April
53	<i>Lolium persicum</i> Boiss. and hohen. ex Boiss	213	March-April
54	<i>Avena fatua</i> Linn.	259	March-May
55	<i>Avena sterilis</i> sub sp. <i>Avena ludoviciana</i> (Dur.) Gill and Magne	256	March-April-May
56	<i>Agrostis viridis</i> Gouan	276	March-August
57	<i>Koeleria argentea</i> Griseb.	191	March-April
58	<i>Polypogon monspeliensis</i> (Linn.) Desf.	244	Throughout much of the year. But mostly between March-July
59	<i>Polypogon fugax</i> nees ex steud	217	May-August
60	<i>Phalaris minor</i> Retz.	187	March-May
61	<i>Bromus pectinatus</i> Thunb	200	March-April
62	<i>Bromu catharticus</i> Vahl	275	April-July

**Table 2.** Ethnobotanical uses of salt range grasses.

S/ No	Botanical name	Local name	Voucher no.	Ethnobotanical uses
1	<i>Arundo donax</i> Linn.	Nari	121	Its hollow stem is used for making pens, musical instrument (Bansri) and also used to make baskets and its stem along with leaves is used in roof thatching.
2	<i>Desmostachya bipinnata</i> (Linn.) Stapf	Dab	338	Its culms including the part of inflorescence are commonly used as brooms
3	<i>Eulaliopsis binnata</i> (Retz.)C.E.Hubbard	Babhir	274	Its long, narrow and stiff leaves are used for making ropes. It is also used for making Chabies that are used for keeping food and brooms locally called (Kucha), which is sold in the market.
4	<i>Saccharum bengalense</i> Retz.	Saroot	63	The leaves and stem are used for thatching huts for animals, and for making baskets locally called Khari. Its stem is also used for making pens (Culum).
5	<i>Saccharum spontaneum</i> Linn.	Kahi	9	The stem is used to woven winnowing trays (Chaj) that is used to separate chaff from grain. Its inflorescence is also used for roof thatching.

**Table 3.** Ethnomedicinal uses of salt range grasses.

S/ No.	Botanical name	Local name	Voucher no.	Ethnomedicinal uses
1	<i>Cymbopogon jwarancusa</i> (Jones) Schult	Khavi	58	The whole plant including roots is burnt and its infusions are given to the patient suffering from chicken pox. It is also mixed with mustard seeds to make the mustard oil aromatic.
2	<i>Cynodon dactylon</i> (Linn.) Pers	Khibal	83	Its root decoction is given to cattle suffering from respiratory diseases. Its roots are kept in stores to keep away insects from wheat grains.
3	<i>Desmostachya bipinnata</i> (Linn.) Stapf	Dab	61	Its root paste is used along with milk against rheumatism.

Table 3. Contd.

4	<i>Setaria italica</i> (Linn.) P. Beauv	Kangni	105	Its flour is used to make sweet (kangni halwa), that is given to patients suffering from skin diseases that is, Chicken pox.
5	<i>Hordium vulgare</i> Linn.	Jao	70	Its flour (Sattu) is used with water as a common summer drink. It is used to cool the body and persons suffering from jaundice.



Figure 1. A- *Cymbopogon jwarancusa*, B- *Cynodon dactylon*, C- *Desmostachya bipinnata*, D- *Setaria italica*.

al., 2008) and to create awareness in the local communities to protect the medicinal grasses, as once vegetation is lost; it is very difficult to restore it.

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