

## BIODIVERSITY OF GRASSY WEEDS AND THEIR ETHNOBOTANICAL IMPORTANCE IN DERA ISMAIL KHAN DISTRICT (D. I. KHAN), KPK, PAKISTAN

SARFARAZ KHAN MARWAT<sup>1\*</sup>, FAZAL-UR-REHMAN<sup>2</sup>, KHALID USMAN<sup>3</sup>,  
ABDUR RASHID<sup>4</sup> AND SAID GHULAM<sup>3</sup>

<sup>1</sup>University Wensam College, Gomal University, Dera Ismail Khan KPK, Pakistan.

<sup>2</sup>Faculty of Pharmacy Gomal University, Dera Ismail Khan, KPK, Pakistan.

<sup>3</sup>Faculty of Agriculture, Gomal University, Dera Ismail Khan, KPK, Pakistan.

<sup>4</sup>Arid Zone Research Institute, Dera Ismail Khan, Pakistan

### Abstract

The present study is based on research work carried out during 2005-2007 in Dera Ismail Khan District, Khyber Pakhtun Khwa (KPK), Pakistan. The research area was extensively surveyed in order to investigate grassy weed species. From the study area 28 weed species of grasses belonging to 22 genera were collected. Grassy weeds on one hand cause serious problems and on the other hand they are used for various purposes by local people. Mainly, grasses are used as fodder in the area; some are used for thatching and for medicinal purpose. Data inventory constitutes botanical name, tribe, local name, English name and voucher number (Table 1.), habit and habitat, flowering and fruiting period and ethnobotanical importance (Table 2). Pictures of six plants have also been provided.

### Introduction

Weeds, in simpler terms, are plants that interfere with the healthy or normal growth and development of crops (Qureshi *et al.*, 2009). They are now known to limit the production of crops causing serious losses in the output of grains, seeds and fruits etc., (Jakhar *et al.*, 2005; Marwat *et al.*, 2008; Abbas *et al.*, 2010). They also harm the agricultural crops in other ways as well. They harbour insect pests and plant diseases and on account of their rapid regenerative powers they pose serious problems in maintaining gardens, lawns, roads and water channels (Chaudhri, 1992). They may compete and exhibit allelopathy against the associated species (Hussain *et al.*, 1988).

Family Poaceae or grass family consists of some 620 genera and about 10,000 species. In Pakistan grasses are represented by 158 genera and 492 species (Cope, 1982). They are the most widely distributed of all flowering plants and form prominent feature of the flora of every continent. The grassy weeds are highly conspicuous and often significant components of the flora of virtually every cropping system in the world. They are found in nearly every crop during the respective seasons, rabi (spring) and kharif (autumn). Many grassy species are among the most destructive weeds. Their slender and apparently delicate forms belie their ability to compete with most other plants.

Grassy weeds on one hand cause serious problems and on the other hand they are used for various purposes by local people. Mainly, grasses are used as fodder in the area; some grasses are used for thatching and for medicinal purpose (Ahmad *et al.*, 2009).

Dera Ismail Khan (D.I. Khan) is the southern most district of the Khyber Pakhtun Khwa (KPK), Pakistan, lying between 31°.15' and 32°.32' north latitude and 70°.11' and 71°.20' east longitude. Most of the area of the district consists of flat dry alluvial plain, commonly

known as *Daman* which makes up more than 80% of the area. The district is gifted with diverse and unique flora, as it is adjacent to the South Waziristan Agency and Sulaiman Range in the West, Koh Sheikh Buddin in the North and Indus River in the East. The summer season is dry and hot. June is the hottest month during which the mean maximum and minimum temperature is recorded around 42°C and 27°C respectively. December, January and February are the cold months. In January the mean maximum and minimum temperature is around 20°C and 4°C respectively (Anon., 1998).

No research work on grasses in Dera Ismail Khan District has been done hence the present study was undertaken.

### Materials and Method

The study was conducted during May 2005 - April 2007 in different parts of D.I.Khan District. The research area was extensively surveyed in order to investigate grassy weed species and to document their uses by the local people of the area. Plants were collected and identified with the help of available literature (Ahmad, 1954, Jafri, 1966; Cope, 1982) and by comparing with the already identified plant specimens of the herbarium, Quaid-i-Azam University, Islamabad (ISL). After correct identification the plants were given voucher numbers and deposited as voucher specimens in the said herbarium, for future references.

### Result and Discussion

Present findings were confined to 28 species of grasses belonging to 22 genera. An alphabetical list of collected grasses along with their local name, English name and voucher number, habit and habitate, flowering and fruiting period and ethnobotanical importance is given in Tables 1 & 2.

\*E-mail: skhan.marwat@gmail.com

Table 1. List of grassy weed species collected from Dera Ismail Khan District.

S. #.	Botanical name	Tribe	Vern./Local name	English name	V. No.
1.	<i>Aristida adscensionis</i> L.	Aristideae	Lappa, Lamba	Sixweeks Tripleawn	150
2.	<i>Avena fatua</i> L.	Aveneae	Jangli Jai, Javdri	Spring or common wild oat	305
3.	<i>Brachiaria eruciformis</i> (J.E.Smith.) Griseb.	Panicaceae	-----	Sweet signal grass	422
4.	<i>Brachiaria ramosa</i> (L.) Stapf.	Panicaceae	Sonwak chitta.	Browntop millet	38
5.	<i>Brachiaria reptans</i> (L.) Gardner & Hubbard	Panicaceae	-----	Running grass	425
6.	<i>Cenchrus ciliaris</i> L.	Panicaceae	-----	Buffel grass, African foxtail	154
7.	<i>Cenchrus setigerus</i> Vahl	Panicaceae	Anjan, dhaman, bigari	Birdwood grass.	44
8.	<i>Chrysopogon aucheri</i> (Boiss.) Stapf	Andropogoneae	-----	Aucher's grass	149
9.	<i>Cymbopogon jawarancusa</i> (Jones) Schult.	Andropogoneae	.Khawi, Sargarai	Wild lemon grass	84
10.	<i>Cynodon dactylon</i> (L.) Pers.	Chlorideae	Dab or doob, Kubbal	Bermuda grass, Lawn grass	28
11.	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Eragrostideae	Madhana ghas	Egyptian Crabgrass	64
12.	<i>Dactyloctenium scindicum</i> Boiss.	Eragrostideae	Madhana		146
13.	<i>Desmostachya bipinnata</i> (Linn.) Tapf	Eragrostideae	Dab, Kusa, Drubh	Deep root grass, Dab grass.	17
14.	<i>Dichanthium annulatum</i> (Forssk.) Stapf.	Andropogoneae	Murgha ghas	Delhi grass, marvel grass	96
15.	<i>Digitaria ciliaris</i> (Retz.) Koel	Panicaceae	-----	Henry's Crab grass	37
16.	<i>Dinebra retroflexa</i> (Vahl.) Panzer	Eragrostideae	Bara sarpot	Vipergrass	68
17.	<i>Echinochloa crus-galli</i> (Linn.) R.Beauv.	Panicaceae	Bara samwak	Barnyard grass	423
18.	<i>Eragrostis minor</i> Host, Gramm.	Eragrostideae	-----	Little love grass.	43
19.	<i>Imperata cylindrica</i> (L.) Raeuschel.	Andropogoneae	Dab, Siru, Ulu	Cotton-wool grass	29
20.	<i>Ochthochloa compressa</i> (Forsk.) Hilu	Eragrostideae	Phalwan, chihimbar	-----	427
21.	<i>Panicum antidotale</i> Retz.	Panicaceae	Gharam, ghum ghah	Blue panicum	428
22.	<i>Paspalum paspaloides</i> (Michx.) Scribnerin	Panicaceae	Naru ghas	Water grass, ginger grass	57
23.	<i>Polyopogon monspeliensis</i> (L.) Desf.	Aveneae	Dumb ghas, Ghoin	Foxtail fescue, rabbit foot grass	26
24.	<i>Saccharum benghalensis</i> Retz.	Andropogoneae	Kana or Sarkanda	Munj sweet cane, Bengal cane	243
25.	<i>Saccharum spontaneum</i> L.	Andropogoneae	Kahi, kahu, kans.	Wild cane, Thatch grass	422
26.	<i>Setaria glauca</i> (Linn.) Beauv	Panicaceae	Kangni, bandra, bandri	Yellow foxtail	112
27.	<i>Setaria verticillata</i> (Linn.) Beauv	Panicaceae	Chirchira, barchitta	Hooked bristle grass	39
28.	<i>Sorghum halepense</i> (L.) Pers.	Andropogoneae	Baru, Baran, Jangli Jawar	Johnson grass.	426

Table 2. Indigenous uses of grassy weeds of the research area.

S. No.	Botanical name	Habit and habitat	Flowering period	Uses
1.	<i>Aristida adscensionis</i>	Annual or short lived perennial found in gardens, rocky habitation	Mar – Dec.	Eaten by cattle when young but at maturity it causes stomach troubles
2.	<i>Avena fatua</i>	Annual weed of cereal crops of wheat, barley etc	Mar-May (– Aug.)	It is used as a fodder
3.	<i>Brachiaria eruciformis</i>	Annual, found in cultivated fields, near wet irrigated land	Jul - Sept.	It is used as a fodder
4.	<i>Brachiaria ramosa</i>	Annual, found along water courses and crop fields	June-July & October	It improves milk production and is good fodder for cattle feeding.
5.	<i>Brachiaria reptans</i>	Annual, common in cultivated fields and along water courses	July-September.	A good fodder grass.
6.	<i>Cenchrus ciliaris</i>	Perennial, found on slopes/mountains, in or near irrigated near fields	Mar – Oct.	It is a good fodder grass which is said to increase milk in cows.
7.	<i>Cenchrus setigerus</i>	Perennial, occurs in fields of sandy or stony clayey soil, rarely on slopes and near water courses	Mar. – Sept.	It is said to increase milk production and is much in demand.
8.	<i>Chrysopogon aucheri</i>	Perennial desert species growing on the rocky slopes & in rock fissures	Mar-May, Sept.- Nov.	A fodder plant in the area.
9.	<i>Cymbopogon jawarancusa</i>	Perennial, common on mountains rocky slopes, rare on edges of fields.	Apr-Nov.	As a fodder it ranks poor and cattle eat it only when hard pressed.
10.	<i>Cynodon dactylon</i>	Perennial weed commonly found in summer crops, lawns and elsewhere	Mar-Nov. all year around.	It is considered as first class fodder grass.
11.	<i>Dactyloctenium aegyptium</i>	Annual, commonly found in summer crops, wet lands and shady places	Jul-Oct.	It is a nutritious grass used as fodder.
12.	<i>Dactyloctenium scindicum</i>	Annual, common on sandy ground and mountain slopes of the area	Jul-Sept.	It is an average fodder grass, used when good ones are not available
13.	<i>Desmostachya bipinnata</i>	Perennial, frequently found in waste places, near fields, along road side	Jun-Oct.	It is used as brooms. It is a troublesome weed
14.	<i>Dichanthium annulatum</i>	Perennial, morphologically variable and occurs in cultivated fields, lawns and along water channels	Mar-Nov.	It is a nutritive grass and is good for cattle feeding
15.	<i>Digitaria ciliaris</i>	Annual, found in cultivated fields	Jul– Oct.	Used as a fodder; treated as weed.
16.	<i>Dinebra retroflexa</i>	Annual common weed of cultivation	May – Oct.	In Sind it is said to be favourite food of buffaloes.
17.	<i>Echinochloa crus-galli</i>	Annual, found in sugarcane and rice field. It also may affect other water loving crops of the rice zone.	Jun – Oct.	It is said to be a good fodder grass and is readily eaten by horses and cattle.
18.	<i>Eragrostis minor</i>	Annual, occurs as a weed in gardens, irrigated fields and ditches	May-Sept.	A fodder grass, used when nutritious grasses are not available.
19.	<i>Imperata cylindrica</i>	Perennial, occurs on road sides, grassy plots and gardens, along water courses, common in fire burnt fields	Mar-Nov.	Cattle do not eat it unless tender and young. It is treated as weed.
20.	<i>Ochthochloa compressa</i>	Perennial, commonly found in waste places	Mar.-Sept.	Reported to be a good grass for cattle and horses.
21.	<i>Panicum antidotale</i>	Perennial with woody rootstock. Common amongst hedges and bushes	Mar - Oct.	It is an excellent sand binder, but of doubtful value as fodder.
22.	<i>Paspalum paspaloides</i>	Perennial, affects summer crops, occurs in gardens and along water courses	Apr - Sept.	It provides a good pasturage, especially on alluvial flats.
23.	<i>Polypogon monspeliensis</i>	Annual weed common in marshy places, along water courses.	Mar-July	Little value as a fodder.
24.	<i>Saccharum benghalensis</i>	Perennial. common near water channels, water canal banks and on sandy soil	Oct – Jan.	It is used for matting and thatching; stem is used for making screens and chairs. Its stem is also used for making pens (Qalam). Also acts as an effective sand binder. It is treated as a weed and is stubbed out.
25.	<i>Saccharum spontaneum</i>	Perennial, common along stream banks, margins of ponds. Rare in dry places	Jul – Sept.	Used for thatching. 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. Also acts as an effective sand binder
26.	<i>Setaria glauca</i>	Perennial troublesome weed mainly affects summer crops. Also found in open grassland	May - Oct.	An average fodder grass, used when better grasses are not available.
27.	<i>Setaria verticillata</i>	Annual, common in gardens, on shady and wet places	April-Oct.	It is used as fodder when young.
28.	<i>Sorghum halepense</i>	Perennial, very resistant and troublesome weed of hot dry condition	May-Oct.	It is harmful as fodder when young, but near maturity or after rains cattle may eat it without harmful effects. It reduces milk production

**Diversity of grasses:** Grasses inhabit the earth in greater abundance than any other comparable group of plants. Some are adapted to warm, humid and tropical climate while others are established in the polar regions, where the growing season is two months or less and direct sunlight is absent for many months of the year. Some are important elements of marsh and swamp vegetation, and other inhabit desert regions where the annual precipitation is 5 inches or less.

Even before the time of recorded history, the grains of grasses provided a staple food supply for the human race. The value of grasses to mankind has been recognized since the dawn of human civilization and culture of cereal grasses dates back to a period when man was emerging from wild beast stage. The members of this group are present in all the conceivable habitats, suitable for growth of plant communities. Grasses are used as forage for domesticated animals, range forage and soil conservation (Ahmad *et al.*, 2009).

**Research area and grassy weeds:** In the present study 28 species of grassy weeds from D.I.Khan District belonging to 22 genera were collected (Table 1). *Chrysopogon acheri* is a wiry desert species growing in the most inhospitable habitats such as rocky slopes and rock fissures, a welcome fodder plant in these places. Species like *Panicum antidotale*, *Cenchrus ciliaris*, and *Cenchrus setigerus* are recommended for the fixation and reclamation of sand dunes in areas of low rainfall. These species are well distributed in D.I.Khan.

Some grasses such as *Cymbopogon jwarancusa* (Khavi) are abundant on mountains and rocky slopes and near sand stones (Ahmad *et al.*, 2009). Sand stones and lime stones are the common rock types of Sheikh Buddin and Khisore Range of D.I.Khan (Anon., 1998).

*Cynodon dactylon* is present throughout Pakistan. It makes excellent hay and is considered a first class fodder grass (Cope, 1982). High grazing pressure of live stock eliminated most of the grasses from the area but *C. dactylon* survived because it is a high yielding palatable species and very resistant to grazing and trampling (Whyte *et al.*, 1959). It is observed that *C. dactylon* shows maximum resistant to grazing, out of all the fodder species, while other fodder species are suppressed in the constant grazing area (Ahmad *et al.*, 2009).

*Dactyloctenium aegyptium* a fodder grass that is present in cultivated fields, shady places and moist soil is more abundant and diverse species as compared to *Dactyloctenium scindicum*. It is adapted to soils of wide range of texture, and it is one of the most drought resistant grasses, because of its rapid growth of seedlings in each wet season, even of short duration (Skerman, 1990). *D. scindicum* is distinguished from *D. aegyptium* by having short and falcate spikes and is restricted to sandy mountain slopes. In our study it has been observed that species like *D. scindicum* grow frequently in places where wind blown sand has accumulated (Ahmad *et al.*, 2009).

*Desmostachya bipinnata* is a trouble-some weed in the plantation. The roots produce thick net work under ground does not allow other plants to come up. Cattle do not normally graze it. *Dicanthium annulatum* is a nutritive grass and is good for cattle feeding and occurs in

favourable patches along water channels, cultivated fields and lawns (Khan, 1957).

*Dinebra retroflexa* is loosely tufted grass. Usually this species is not considered to be very good as a fodder grass but in Sind it is said to be favourite food of buffaloes. It is a very common weed of cultivation (Cope, 1982). However, in D.I.Khan area it is not very common.

*Echinochloa crus-galli* is said to be a good fodder grass and is readily eaten by cattle. *Eragrostis minor* is an average fodder grass which is eaten when more nutritious grasses are not available. It occurs as a weed in gardens, irrigated fields and ditches (Khan, 1957). Grains are edible. Seeds are boiled and eaten as a substitute of rice by Santal tribes of India (Mitra & Mukerjee, 2005). *Imperata cylindrica* is treated as a weed and occurs on road sides, grassy plots and gardens. Cattle do not eat it unless tender and young (Khan, 1957). *Saccharum spontaneum*, that is very common along stream banks and margins of ponds, is an excellent soil binder that is capable of colonizing areas such as soil and sand left bare by retreating floods. Its root system is extremely extensive and acts as an effective soil binder (Skerman, 1990). Large tussock forming grasses such as *S. spontaneum* and *S. bengalense* are only recorded along water channels. *S. spontaneum* is also used in the area for thatching huts for the cattle. *Saccharum bengalensis* plant is a valuable grassy weed used for multipurposes. The whole plant is valued as fuel. Fibers are extracted from the leaf-sheaths, which are used for making of variety of ropes. The ropes are used for various purposes. The culms (stems) and peduncles of the inflorescence of the plant are used in making of *Chiks* (chicks are hung over doors and windows for shade; also used in roofs). Birds eat its seeds. Cows and buffaloes eat the young tender leaves. The plant is soil binder (Marwat, 2009). Tussocks of *Saccharum* species are useful for the nesting of animals and birds (Chaudhary, 2001). Low grade country liquor is prepared from the achenes of *Setaria glauca*. Its grains are used as fodder by polia tribes of India. Inflorescences of *Setaria verticillata* are mixed with the stored grains by santal tribes of India to expel the rodents (Mitra & Mukerjee, 2005).

**Medicinal grasses:** *Cymbopogon jwarancusa* has aromatic leaves and base of the stem, is used for curing chicken pox by the local people of the area (Ahmad *et al.*, 2009). Its pleasant smell is inhaled for the treatment of blisters and typhoid. Upper parts of the roots are boiled in water. The water is strained and is given to the children along with sugar 2-3 times daily. It is considered to be useful for purification of blood, dyspepsia and flatulence by local people of the area (Marwat *et al.*, 2008) (Fig. 1).

*Cynodon dactylon* is also used from medicinal point of view. Root decoction of *C. dactylon* is given to cattle for respiratory diseases in different localities of study area (Table 3), while in Kanya Kumari district of Southern India, leaves of *C. dactylon* with coconut oil are used to cure skin diseases and in Rajasthan its aqueous extract with sugar is given to persons suffering from nostril haemorrhage, (Ahmad *et al.*, 2010).

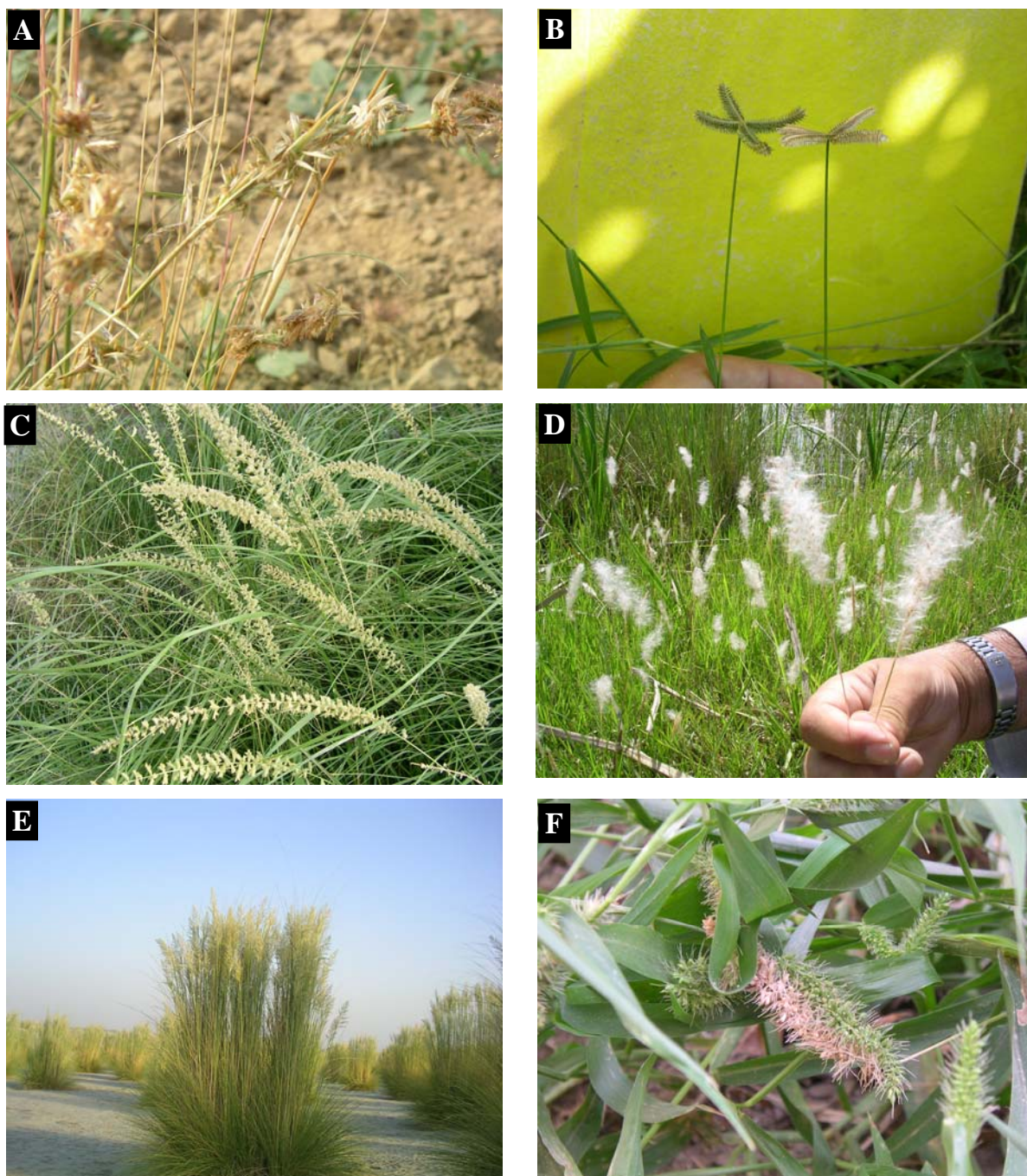


Fig. 1. A. *Cymbopogon jawarancusa*, B. *Dactyloctenium aegyptium*, C. *Desmostachya bipinnata*, D. *Imperata cylindrica*, E. *Saccharum bengalenses*, F. *Setaria verticillata*.

**Table 3. Indigenous ethnomedicinal uses of grassy weeds.**

S. No.	Botanical name	Local name	Ethnomedicinal uses
1.	<i>Cymbopogon jwarancusa</i> (Jones) Schult	Khavi	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	Dab, Kubbal	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, Kusa, Drubh	Its root paste is used along with milk against rheumatism.
4.	<i>Saccharum benghalensis</i>	Kana or Sarkanda	Ash of the leaves is mixed with water, after an hour it will settle down in the bottom. The strained water is given to the animals suffering from 'urine retention' disease.



Extract of the rhizome is applied on the cut to check bleeding and to prevent infection by munda tribes of India. Extract of the whole plant is applied externally on the outer surface of eyelid to cure redness and irritation of the eye due to the summer heat by Munda tribes (Mitra & Mukerjee, 2005).

Medicinal and aromatic plants play an important role in rural economy, all over the world, especially the developing countries (Ahmad *et al.*, 2009).

Root paste of *Desmostachya bipinnata* is used against rheumatism (Table 3) in Soon Valley of Salt Range, while 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 (Ahmad *et al.*, 2010). Ash of the leaves *Saccharum benghalensis* is mixed with water, after an hour it will settle down in the bottom. The strained water is given to the animals suffering from 'urine retention' disease (Marwat *et al.*, 2008). *Saccharum spontaneum* is also used for medicinal purpose, its root decoction is given to cure eruptions on the skin caused due to excessive consumption of country liquor by different tribes of India (Mitra & Mukherjee, 2005). Its root decoction is taken for intestinal worms, fever and body pain (Ahmad *et al.*, 2009).

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