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Preliminary Survey of Sedge and Grass flora of GCW, Gandhi Nagar, College Campus, Jammu, J&K and their Ethno Botanical Uses

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Anju Koul
Assistant Professor
Dept. of Botany,
Government College for Women,
Gandhi Nagar, Jammu, J&K, India

Sania Hamid
Assistant Professor
Dept. of Botany,
Government College for Women,
Gandhi Nagar, Jammu, J&K, India

Abstract

Govt. College for Women, Gandhi Nagar, Jammu is located in suburbs of Jammu, on the southern bank of Tawi river. The college spreads over 186 Kanals of land. The vegetation of the college campus is of a dry, mixed deciduous type and sedges and grasses form an important component of its wild flora. Although sedges and grasses represent the main wild plant component of the vegetation of college campus they have never been studied so far.

Taking into consideration taxonomic diversity of sedges and grasses and their functional role in the restoration of ecosystem, biogeochemical cycling and their ethnobotanical uses, a preliminary survey of sedge and grass species was conducted in the college campus from July 2019 to March 2020. The study revealed a total of 1 genus and 2 species of sedges and 17 genera and 22 species of grasses. Many of these sedge and grass species have known ethno botanical uses.

Keywords: Sedges, Grasses, Ethno Botanical Uses.

Introduction

The term “Grasses” commonly refers to monocotyledonous, annual and perennial herbs with narrow leaves growing from the base and having fibrous roots. They include both the "true grasses", from the Poaceae family and the sedges from Cyperaceae family. The true grasses include cereals, bamboo and the turf grasses, while sedges include many grass-like non grass plants particularly, wildmarsh and grassland plants from Cyperaceae family.

Poaceae and Cyperaceae are the two largest families of Monocotyledons. Cyperaceae is represented by 70-80 genera and 4000 species distributed throughout the world. The Family Poaceae comprises of about 11,290 species in approximately 707 genera [1] worldwide. Grasses and sedges are the dominant vegetation in many habitats, including grassland, marshes, reed swamp etc., and they form important part of almost every other ecosystem. Grasslands are among the largest ecosystems in the world. Their area is estimated at 52.5 million square Kilometers, or 40.5 percent of the terrestrial area excluding Greenland and Antarctica [2]**.**Grasses are very important source of food and fodder. Many types of animals including many herbivorous mammals and insects are dependent on these grasses and grass like plants as their main food. In addition they also find their use in ethno medicinal and various religious practices. Many of grasses and sedges find their mention in ancient Indian medicine literature.

From the ecological point of view also they are very important as good soil binders as they make a carpet over the soil thus preventing soil erosion. They also add lot of Soil Organic matter (SOM), thus increasing fertility of soil. In addition they also play important role in biogeochemical cycling of Carbon, Nitrogen and Phosphorus [3]. They are an important component of the urban and suburban landscapes in most parts of the world. Despite the importance of grasses to humans in various ways, the grasses remain to be less studied plant groups as compared to other flowering plants especially in India. This may be due to difficulty in identification because of their small size of floral organs and complicated structure of inflorescence. Some important works on diversity of grasses in Indian include “A Handbook of some South Indian Grasses” by Achariyar

and Tadulinga, 1921 [4], "The Bombay Grasses" by Blatter, 1935 [5], "The Grasses of Burma, Ceylon, India and Pakistan" by Bor, 1960 [6], "The Grass flora of India" by Jain, 1986 [7], "Grasses of North-Eastern India" by Shukla, 1996 [8], and "Important grasses of Eastern Ghats"; Moulik, 2000 [9].

Jammu city is the winter capital of Indian Union territory of Jammu and Kashmir and the headquarters of Jammu district. It is located at 32°73' N and 74°87' E, at approximately 300m altitude above sea level on a sub hilly area. It is situated on the banks of Tawi River with an area of around 240 Km^2. There is large diversity of grass species growing in Jammu city as part of wild flora. Inspite of the great diversity of the grass species very less research work has been done in this direction [10].

Our study area, Government College for Women Gandhi Nagar Jammu campus is part of newly urbanized part of Jammu city situated on southern banks of river Tawi. It is part of outer plains which extend from Kathua up to Jammu. Total area of college campus is 186 kanals of land covered by a boundary wall on all sides. Flora of college campus comprises of variety of annual and perennial weeds in addition to large number of cultivated plant species. Sedges and grasses form a major component of college campus flora. Both annual and perennial grasses and other grass like species are observed. Most of these species are wild in addition to two species of cultivated grasses in college botanical garden. Taking into consideration the taxonomic diversity of grasses and sedges, their functional role in the restoration of ecosystem, biogeochemical cycling and their various ethno botanical uses,present study was initiated. Earlier sedge and grass flora from different parts of India and abroad have been studied by Bhat and Narayan, 2001[11], Ravi and Mohanan, 2002[12], Desai R, 2013[13], Ullah Z *et al.,* 2015[14], Dashahre *et. al.,* 2020 [15], Subramanian *et al.,* 2021 [16]

Aim of the Study

This study is very important, as it will form baseline for further research on identified spectes and their ecological and other elthnobotanical uses.

Materials and Methods

Primary data was obtained by extensive and exhaustive field survey conducted in different areas of college campus from July 2019 to March 2020. Study included all parts of college campus. Different sedge and grass species were collected in polythene bags to conserve moisture. These specimens were taken to laboratory for herbarium preparation. Specimens after drying in plant press were pasted on the herbarium sheets. After field survey and herbarium preparation, identification of collected plant specimens was done using available literature and confirmed with the help of experts.

Results and Discussion

In this preliminary investigation, a total of two species (2), belonging to one genus of sedges and 22 species belonging to 17 genera of grasses were identified. Out of these plant species 22 sedge and grass species were wild and two species of grasses are cultivated in college botanical garden (Table 1). These recorded sedge and grass species form an important part of the ecosystem and provide food to large number of graminivores including many species of insects, birds, rodents etc.

Table 1: List of Sedge and Grass Species Identified from College Campus

S. No.	Name of species	Common Name/ Names	Family	Cultivation Status
1.	*Cyperus difformis*	Variable flat sedge, small flower umbrella-sedge, rice sedge	Cyperaceae	Wild
2.	*Cyperus rotundus*	Coco-grass, Java grass, Nut grass	Cyperaceae	Wild
3.	*Bothriochloa pertusa*	Indian couch grass, Indian-bluegrass.	Poaceae	Wild
4.	*Brachiaria ramosa*	Browntop Millet	Poaceae	Wild
5.	*Brachiaria reptans*	Running grass, Para grass	Poaceae	Wild
6.	*Cenchrus prieurii*	Large-Spike Buffel Grass	Poaceae	Wild
7.	*Cenchrus setigerus*	Birdwood Grass	Poaceae	Wild
8.	*Chloris barbata*	Swollen Finger Grass.	Poaceae	Wild
9.	*Cyanodon dactylon*	Bermuda grass, Dhoob grass	Poaceae	Wild
10.	*Cymbopogon citriatus*	Lemon grass	Poaceae	Cultivated
11.	*Cymbopogon martini*	Palmarosa, Indian Geranium	Poaceae	Cultivated
12.	*Dactyloctenium aegyptium*	Egyptian crowfoot grass	Poaceae	Wild
13.	*Desmostachya bipinnata*	Halfa grass, Big cordgrass	Poaceae	Wild
14.	*Digitaria ciliaris*	Wild Crabgrass	Poaceae	Wild
15.	*Digitaria sanguinalis*	Hairy crabgrass, Hairy finger-grass, Large crabgrass	Poaceae	Wild
16.	*Eleusine indica*	Indian goosegrass	Poaceae	Wild
17.	*Elymus repens*	Quackgrass.	Poaceae	Wild

18.	*Eragrostis cilianensis*	Stinkgrass	Poaceae	Wild
19.	*Microstegium ciliatum*	Browntop grass	Poaceae	Wild
20.	*Oplismanus burmanii*	Burmann's basketgrass	Poaceae	Wild
21.	*Panicum antidotale*	Blue panicgrass	Poaceae	Wild
22.	*Paspaldium flavidum*	Yellow Watercrown Grass	Poaceae	Wild
23.	*Setaria pumila*	Yellow foxtail, yellow bristle-grass	Poaceae	Wild
24.	*Setaria viridis*	Green foxtail, Green bristlegrass	Poaceae	Wild

Many species of these identified sedges and grasses are known to have various Ethno botanical uses in addition to their role in various ecological processes (Table 2). In addition, many identified species are known to have ethno medicinal uses for curing various ailments Jain 1991[17], Katewa & Sharma 2004. [18], Phondani *et. al.,* 2010[19], Jakhar 2015[20], Kabeer *et. al.,* 2017 [21], Nacakci & Dutkuner 2018 [22], Sanjayrao and Sanjay [23] 2019. Earlier also ethno botanical and ethno medicinal properties of various grass and sedge species have been reported from different parts of the world (Simpson and Inglis, 2001[24], Mitra and Mukherjee, 2009, [25], Ahmad *et. al.,* 2010, [26], Chaudhri *et. al*., 2013 [27], Kumari and Saggoo, 2015 [28], Harun *et*. *al*., 2017 [29], Udari, 2018 [30].

Table 2: Ethno Botanical uses of Identified Sedge and Grass Species

S. No.	Name of species	Family	Ethno botanical Uses
1.	*Cyperus difformis*	Cyperaceae	Leaves used as antibiotic, paste applied externally for cutaneous infection.
2.	*Cyperus rotundus*	Cyperaceae	Root astringent, diuretic, used in jaundice, snake bite. Whole plant used in making mats.
3.	*Bothriochloa pertusa*	Poaceae	Used as fodder. Used for controlling soil erosion.
4.	*Brachiaria ramosa*	Poaceae	Used to provide ground cover, stabilize the soil and reclaim polluted soils
5.	*Brachiaria reptans*	Poaceae	Leaf used to treat anaemia. Juice obtained by Crushing and boiling.
6.	*Cenchrus prieurii*	Poaceae	Seeds used as substitute cereals during scarcity and famine.
7.	*Cenchrus setigerus*	Poaceae	Grain edible, plant used as fodder.
8.	*Chloris barbata*	Poaceae	Juice used as antimicrobial to treat skin disorders, fever, diarrhea, rheumatism and diabetes.
9.	*Cyanodon dactylon*	Poaceae	Leaf used to cure dropsy, whole plant for relieving menstrual cramps. Root for dysentery and hysteria. Leaf for piles and bleeding, urinary complaints, vomiting etc.Used in various religious practices.
10.	*Cymbopogon citriatus*	Poaceae	As flavouring agent. In folk medicine used as antispasmodic, hypotensive, anticonvulsant, analgesic, antiemetic, antiseptic and for treatment of nervous and gastrointestinal disorders.
11.	*Cymbopogon martini*	Poaceae	For treating ringworm, leaf powder is mixed with mustard oil and rubbed on infected part.
12	*Dactyloctenium aegyptium*	Poaceae	Grain used as medicine for stomachache.
13.	*Desmostachya bipinnata*	Poaceae	Medicinal uses to treat Asthma, kidney stone, diarrhea, wound healing etc. Very important in ethno religious practices in hindu dharma.
14.	*Digitaria ciliaris*	Poaceae	For forage, assists in protecting soil against erosion.
15.	*Digitaria sanguinalis*	Poaceae	Mostly used as fodder. A fiber obtained from the plant is used in making paper. A decoction of the plant is used in the treatment of gonorrhea.
16.	*Eleusine indicia*	Poaceae	To treat fever, influenza and hypertension
17	*Elymus repens*	Poaceae	Roots are boiled and consumed for diabetes.

18.	*Eragrostis cilianensis*	Poaceae	Seed used as cereal as famine food, root decoction used against Flu.
19.	*Microstegium ciliatum*	Poaceae	Preferred as fodder grass.
20.	*Oplismanus burmanii*	Poaceae	Leaf used as pain killer
21.	*Panicum antidotale*	Poaceae	Smoke of burning plant used to fumigate wound and as disinfectant in small pox. Leaves have antibacterial property.
22.	*Paspaldium flavidum*	Poaceae	Leaves antiseptic, paste used externally for cutaneous infections. Antioxidant activity.
23.	*Setaria pumila*	Poaceae	Seeds used for flour which is mixed with other flours for consumption.
24.	*Setaria viridis*	Poaceae	Seed diuretic, febrifuge, emollient tonic. Paste of plant with water applied to bruises externally.

Conclusion

This preliminary study revealed large diversity of grasses and sedges in Govt. College for Women Gandhi Nagar Jammu campus. Specimens of different grass species observed were collected, dried and mounted on herbarium sheets and were identified with the help of relevant literature. The plant species were tabulated alphabetically. This study revealed a total of 24 sedge and grass species, out of which two (2) are from Cyperaceae and 22 species are from Poaceae family. During analysis of these grass species it was found that some of these grass species have got various ethno botanical uses in addition to their ecological role. Some of the species are used for preparation of different medicines or for general consumption and fodder in different parts of the world. Hence this study will provide the baseline for future research on different aspects like ecological, ethno pharmacological studies of these plant species of the area.

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