



## Grasses, A Valuable icon of Phyto-diversity:- Case study

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### Abstract

The present study mainly focused to document grass diversity in the Deva Matha college campus, Kuravilangad of Kottayam district, Kerala. The present investigation results in the systematic documentation of total of 23 species of grasses were included in 19 genera. Among them, *Bambusa* is the dominant genera, with 3 species followed by *Digitaria* and *Panicum* are the second largest genera containing 2 species respectively. All the remaining other 16 genera contain single species only. The present study also observed that, there are about 7 species of grasses from the study area are possessing various medico-potentiality with respect to their various parts for treating many ailments. Most of the grasses are also used as fodder.

### 1. Introduction

Monocots are a class of angiosperms distinguished from dicots by several reasons. The distinction was first established by the botanist John Ray in 1682. Monocot seedlings typically have one cotyledon in contrast to the two cotyledons typical of dicots. The simplest way to distinguish monocots is that the leaf in tend to run parallel to the length of the leaf, while dicots leaves feature more branching, reticulate veins. Vascular systems are randomly scattered in the monocot stem. Monocots have adventitious roots that arise from nodes on the stem. It is also distinguished by the lack of secondary growth. Grass is the common word that generally describes monocotyledonous green plants (Watson & Dallwitz, 1992).

The economically most important family in this group are true grasses family *Poaceae* (*Graminae*). These include all the true grain, the pasture grasses, sugar cane and the bamboos. Other economically

important monocot families are *Arecaceae*, *Musaceae*, *Zingiberaceae*, and the onion family *Alliaceae* (Peter *et. al.*, 2005). *Poaceae* rank among the top five families of flowering plants in terms of number of species; but they are clearly most abundant and important family of the earth's flora. They grow on all continents, in desert to fresh water and marine habitats, and at all but the highest elevation (Stevens, 2007). The grass family *Poaceae* is of major economic and ecological importance. The grass from natural homogenous group of plants, with remarkable diversity plays a significant role in the lives of human beings and animals (Yadav, 2010).

Grasslands occupy about 25% of earth's vegetation cover. Grasses are rather uniformly distributed on all continents and in all climatic zones. They are found even in Arctic, in Antarctic and ice covered regions. High percentage of grasses is found in the mountainous region. They grow in marshes, desert, prairies, woodlands, on sands, rocks and almost all type of soils from tropic to polar regions and

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from sea level to the highest elevation (Yadav, 2010). Although it is difficult to calculate exact number of species of grasses, fair estimate is about 10,000 to 11,000 belonging to about 700 genera for the world (Clayton & Renvoize, 1989; Watson & Dallwitz, 1992). In India, it is estimated that there are more than 1200 species belonging to 268 Genera (Karthikeyan *et al.*, 1989; Moulik, 1997).

The grasses are one of the most successful terrestrial life forms on the earth due to their adaptability to changeable environments. They may be annual and perennials and range from herbs of few centimeters to arborescent bamboos measuring a height of 25 meters or more. Most of the grasses can tolerate long period of drought. Climate have big effects in making species diversity among grasses, even in small areas, as the edge of the forest, desert etc showed visible species range (Sreekumar & Nair, 1991). Edaphic or soil factors also influence the distribution of plants (Sarfaraz *et al.*, 2012). The most important climate factors are temperature and precipitation, day length, soil quality etc. govern in the distribution of vegetation. The distribution is limited by extreme temperature; drought, light etc. The light, intensity, humidity, wind speed etc. act as trigger for the growth and development of plants. These factors are specific for every species (Metcalf, 1960).

## **2. Materials and Methods**

### **2.1 Field observation & Documentation**

The present study was based on the specimens collected from Deva Matha College campus, Kuravilangadu,

Kottayam at regular intervals, for a period of one year from June 2015 to February, 2016. During the period of study, all the species were collected in flowering and fruiting stages. Detailed field notes were taken from the field itself. Each specimen was carefully examined in fresh condition using hand lens and it also checked with description given by Gamble & Fischer, 1915-1936) and other relevant Floras (Sasidharan, 2004).

### **2.2 Collection Method**

The grasses were uprooted from its site and removed the soil particles attached to the root surface by washing in running tap water and also kept it in the polythene bags for detailed laboratory studies, using dissection microscope and compound microscope. Final identification of the material was done after consulting relevant literature.

### **2.3 Preparation of herbarium**

For herbarium preparation; collected plants were poisoned with 1gm mercuric chloride in 400ml methylated spirit. The excess water is removed using blotters. The Plants were identified and herbarium was prepared. After that the plant materials were spread on dried newspaper and are pressed under plant press. The voucher specimens are deposited in the herbarium of PG, Department of Botany, Deva Matha College, Kuravilangad for future reference.

## **3. Results and Discussion**

### **3.1 Diversity of grasses in the study area**

The present study on the diversity of grasses in the Deva Matha College campus Kuravilangad, Kerala, reveals that, there are 23 species of



grasses in 19 genera. The plants which are documented from the study area are having diverse economic potentialities. Out of the 19 genera represented, the *Bambusa* is the dominant one with 3 species, followed

by *Digitaria* and *Panicum* with two species each and all others with only one species respectively (Table-1).

**Table-1: List of grass diversity in the study area**

Sl. No.	Name of a grass species
1	<i>Arundinella purpurea</i> Hochst. Ex Steud.
2	<i>Axonopus compresses</i> (Sw.) Beauv.
3	<i>Bambusa multiplexes</i> (Lour.) Raeusch. ex Schult. &Schult.f.
4	<i>Bambusa variegata</i> Siebold ex Miq.
5	<i>Bambusa vulgaris</i> var. <i>aureovariegata</i> Beadle.
6	<i>Choris barbata</i> Sw.
7	<i>Chrysopogon contortus</i> (Retz.)Trin.
8	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) Wats.
9	<i>Cynodon dactylon</i> (L.) Pers.
10	<i>Cyrtococcum oxyphyllum</i> (Steud.) Stapf.
11	<i>Dactyloctenium aegyptianum</i> (L.) Willd.
12	<i>Digitaria ciliaris</i> (Retz.) Descr.
13	<i>Digitaria setigera</i> Roth.
14	<i>Eleusine indica</i> (L.) Gaertn .
15	<i>Eragrostistenella</i> (L.) P. Beauv. ex Roem. & Schult.
16	<i>Heteropogon contortus</i> (L) P. Beauv. ex Roem. & Schult.
17	<i>Oplismenus bermannis</i> (Retz.) P.Beauv.
18	<i>Panicum brevifolium</i> L.
19	<i>Panicum notatum</i> Retz.
20	<i>Paspalum flavidium</i> (Retz.) A. Camp.
21	<i>Pennisetum polystachyon</i> (L) Schult .
22	<i>Rottboellia cochinchinensis</i> (Lour.) W.D. Clylton,



23	<i>Vetiveria zizanioides</i> (L.) Nash.
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### 3.2 Vernacular Names of grasses in the study area

The present study has got the credit of collecting vernacular names (local names in local language) of 14 species of grasses from the study area (Table-2). Vernacular names may vary with respect to the regions. The inhabitants of an area are usually

identifying many of the plants which are connected to their daily life only through their vernacular names. The major issue related to this is the occurrence of different local names for same plants with respect to various regions/locality.

**Table-2: Vernacular Names of the Grasses**

Sl. No.	Name of a grass species	Vernacular Name
1	<i>Axonopus compresses</i> (Sw.) Beauv.	Kaalappullu
2	<i>Bambusa multiplex</i> (Lour.) Raeusch. ex Schult. & Schult.f.	Karmmaram
3	<i>Choris barbata</i> Sw.	Kodappullu
4	<i>Chrysopogon contortus</i> (Retz.) Trin.	Snehapullu, Asthrapullu
5	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) Wats.	Inchipullu
6	<i>Cynodon dactylon</i> (L.) Pers.	Karukappullu
7	<i>Dactyloctenium aegyptianum</i> (L.) Willd.	Kavarapullu, Kakkakalanpullu
8	<i>Eleusine indica</i> (L.) Gaertn .	Wire grass
9	<i>Heteropogon contortus</i> (L) P. Beauv. ex Roem. & Schult.	Soojipullu
10	<i>Panicum brevifolium</i> L.	Thavalappullu
11	<i>Paspalum flavidium</i> (Retz.) A. Camp.	Varakapullu
12	<i>Pennisetum polystachyon</i> (L) Schult .	Oolappullu
13	<i>Rottboellia cochinchinensis</i> (Lour.) W.D. Cylton,	Itch grass
14	<i>Vetiveria zizanioides</i> (L.) Nash.	Ramacham

### 3.3 Medico-potential grasses

Medicinal and aromatic plants play an important role in rural economy, all over the world, especially the developing countries. The present study also observed that, there are about 7 species of grasses from the

study area are possessing various medico-potentiality in their various parts for treating many ailments like stomach problems, head ache, tooth ache, cuts wounds etc. Some of the grasses with medicinal uses are listed in Table-3. The value of grass 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

**Table-3 List of medicinal grasses and their uses**

Sl. No.	Name of a grass species	Medico-potentiality
1.	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Rhizome-paste is mixed with Piper nigrum seeds and it is given at early morning in empty stomach to cure stomach-ache and gastric disorder (Anshuman <i>et al.</i> , 2013).
2.	<i>Cymbopogon flexuos</i> Nees <i>ex</i> Steud.	The leaf extract is used as balm to cure head-ache of the children. (Anshuman <i>et al.</i> , 2013).
3.	<i>Cynadondactyon</i> (Linn.) Pers.	Leaf extract is applied on the external portion of the eyelid to cure redness and irritation of the eye caused due to summer heat. The crushed plants are also applied on the cuts to check bleeding (Anshuman <i>et al.</i> , 2013).
4.	<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.	The plant extract is applied for worm infection (Dileep & Geetha, 2015).
5.	<i>Eleusine indica</i> (L.) Gaertn	Plant extract used for the treatment of stomach problems and digestive troubles (Sarfaraz <i>et al.</i> , 2012).
6.	<i>Heteropogon contortus</i> (L.) P.Beauv	The plant extract is used to cure toothache. Roots of the plant are used for the treatment of snake-bite (Dileep & Geetha, 2015).
7.	<i>Vetiveria zizanioides</i> (L.) Nash.	Fresh roots made into paste, and it is applied on the fore-head to cure head-ache. The decoction of the plant is given for urinary problems. Fresh root decoction is used as a mouth freshener (Anshuman <i>et al.</i> , 2013).

### 3.4 Fodder grasses

Animal nutrition is one of the “most ancient” areas of grass utilization closely related to human history. Besides natural grasses, grassland products are cut green for forage in the vegetation period from areas established subsequently; after the vegetation period, they are used as hay grasses. These are used as forage for domesticated animals (Ahmad *et al.*,

2009). The present study reveals that, there are about 10 species of grasses are used as fodder. Most of these grasses are grazed by animals from the field itself. The diversity and distribution of these fodder grasses are mainly depends on the phytogeographical conditions of an area, it may varies with respect to an area (Table-4).

**Table-4 List grasses used as fodder**

Sl. No.	Name of a grass species
1.	<i>Arundinella purpurea</i> Hochst.
2.	<i>Axonopus compressus</i> (Sw.) P. Beauv.
3.	<i>Chloris barbata</i> Sw.
4.	<i>Digitaria ciliaris</i> (Retz.) Koeler
5.	<i>Digitaria setigera</i> Roth.
6.	<i>Eragrostis tenella</i> (L.) P. Beauv.
7.	<i>Panicum notatum</i> Retz.
8.	<i>Panicum brevifolium</i> L.
9.	<i>Pennisetum polystachyon</i> (L.) Schult.
10.	<i>Rottboellia cochinchinensis</i> Lour.

#### 4. Conclusion

The present investigation aims to document the grass diversity in the Deva Matha College campus, Kuravilangad, Kottayam. As a result of present documentation results the in the systematic treatment of a total of 19 genera including 23 species. The commonly seen grasses in the study area are *Digitaria ciliaris*, *Panicum brevifolium*, *Panicum gardneri*, *Eragrostis tenella* and *Eleusine indica*. The present study also observed that, there are about 7 species of grasses from the study area are possessing various medico-potentiality in their various parts for treating many ailments like stomach problems, head ache, tooth ache, cuts and wounds etc. Moreover, there are about 10 species of grasses which are used as fodder. The present documentations also highlights the importance of grasses to the existing phytodiversity of an area is highly remarkable. Hence they are properly conserved for future.

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