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Documentation on grasses of Bellary district, Karnataka

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Abstract
The value of Grass to mankind has been recognized since very early times and the culture of cereal grasses dates back to period when man was emerging out of the wild beast stage. Poaceae (grass family) is the dominant a diverse, widespread plant species families in Bellary, Karnataka, India. This study aimed to document Poaceae species in the region. A comprehensive survey was conducted during 2022 - 24 in various habitats, including grasslands, wetlands, and agricultural fields. The current research recorded total 32 plant species belongs to 26 genera, The most common Poaceae Genera were *Echinochloa*, *Setaria*, *Chloris*, *Cenchrus*, *Panicum*. Herbs were dominant with 31 species (96.9%). Annuals are 13 (39.39%) and Perennials are 19 (57.57%). Among conservation category 11 (27.28%) belongs to least concerned and 1 under Vulnerable (V). Habitat-specific species composition, highlighting the importance of conservation efforts to protect these species and their habitats. This study provides a foundation for further research on the ecology, evolution, and conservation of Poaceae species in the region.

Keywords: Poaceae, diversity, conservation, IUCN status, Bellary

Introduction

Grasses occupy 23% of forestland area and provide 80% food to the Global population. The staple foods of the great majority of mankind come mostly from grasses. The grains of grasses such as maize in the Americas, rice in Asia, Wheat, Rye, Barley and Oats in Europe, and the sorghums in Africa (and India) provide the main basis of man's carbohydrate diet while flesh of animals that graze on Pastures provides the main source of his proteins and fats. Thus, the nurture of grasses and grasslands is a matter of great importance to him and has always been so. (Barnard and Frankel 1964).

Approximately there are 780 genera and 12000 species across India and in Karnataka 114 genera and 364 species. The members belonging to the family Poaceae are termed as grasses, Approximately 56 genera and 130 species are found in the research area where, they are considered as a highly evolved group in the plant kingdom.

Many of his migrations and invasions have resulted from his search of grasslands. Increasing skill in growing cereal crops and maintaining grazing animals has been a fundamental nature of his progress in civilization. Indeed, the future of his present-day civilization depends largely on his ability to extend these basic resources to his nourishment (Barnard and Frankel 1964). Although the great importance of grasslands lies in providing sustenance, grasses also serve humanity in other ways. It may be used for building homes and furniture (walls, thatch, matting, and brooms), lawns, play grounds and as components of some cosmetics and medicines. (K.Kotresh 2016).

Materials and methods

Study area

Bellary district is situated in the Eastern part of Karnataka. The city is covered over an area of 85.95 Km^2 and it is situated at an altitude of 485m from the mean sea level with 15˚ 09' North latitude to 76˚ 55' East longitude. The district has semi-arid to arid climate and hot summers with 600mm rainfall. Bellary vegetation consists of dry deciduous forests, scrublands, and grasslands. The fig1 shows map of Karnataka and Fig 2 shows the map of Bellary district located in Karnataka State.

Collection & Identification

The specimens of Poaceae were collected across the Bellary district, such as Fort area, Tumati hills, Kottur, Kudligi and Sandur hilly regions. The collected specimens were identified with the help of floras (Gamble, 1935, Cooke, 1908; Hooker, 1896) and Monographs (Blatter & McCann, 1935; Bor, 1960). The collected, poisoned and identified specimens are then mounted on standard Herbarium sheets with wet method, given the number, place and date of collection, etc. These specimens are deposited on the Herbarium sheets.

Fig 1: Map of Karnataka state

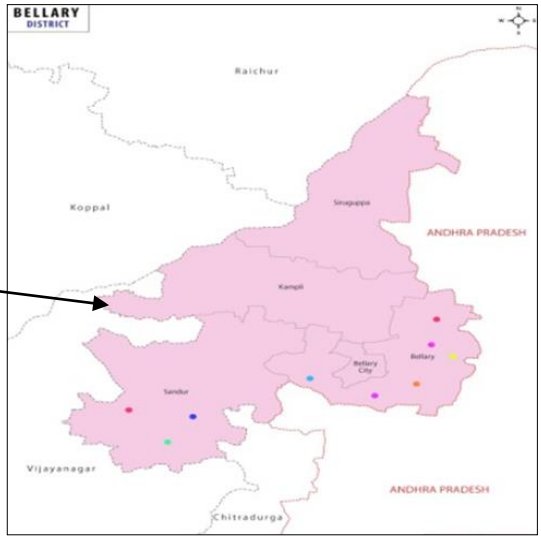

Fig 2: Map of Bellary District

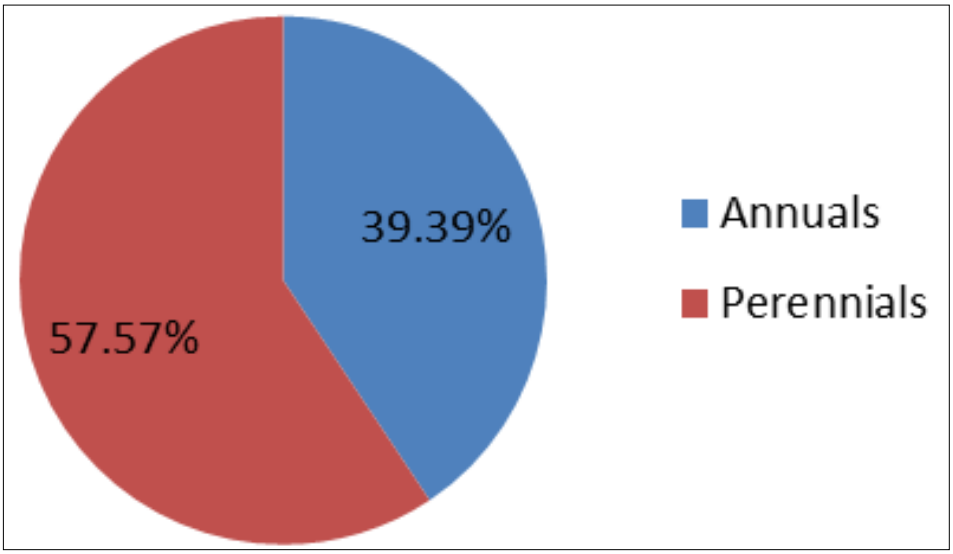

Fig 3: Life forms of Poaceae plant species

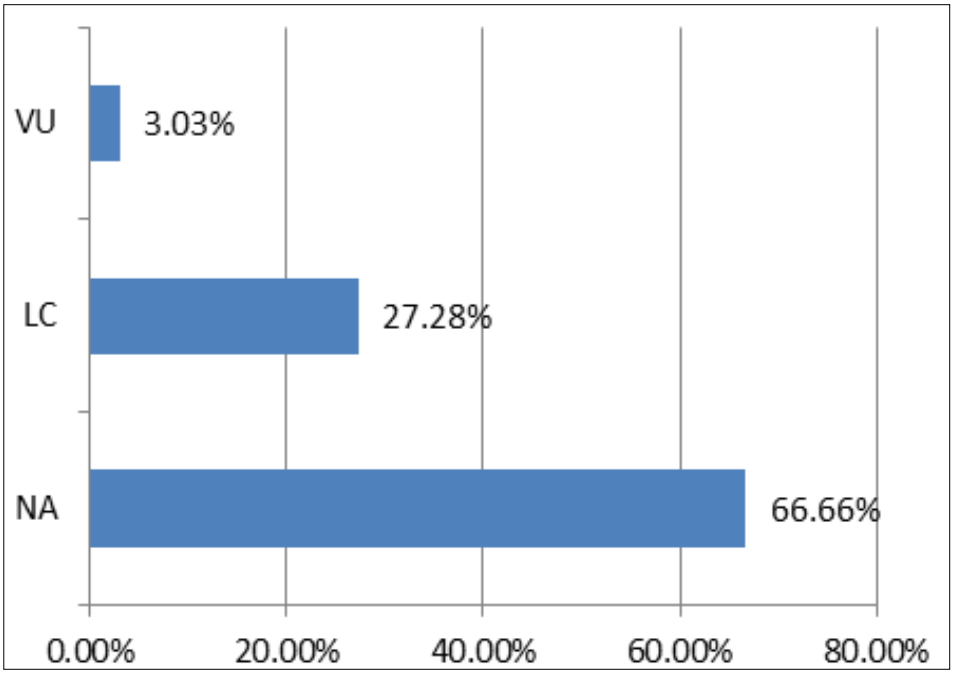

Fig 4: IUCN status of Poaceae species diversity in Bellary District

Result and discussion

The current research recorded totally 32 Poaceae plant species belongs to 26 genera. Dominant Genera were *Chloris*, *Cenchrus*, *Echinochloa*, Etc. An evaluation of 32 species revealed that 31 species life forms are categorized into 2 types, where Annuals are 13 with (39.39%), 19 are Perennials (57.57%). (Fig.3). IUCN status of 32 Poaceae plant species demonstrates, 9 (27.28%) are least concerned and only 1 (3.03%) is Vulnerable (Fig.4). Total 32 plant species were tabulated including their botanical name, vernacular name, IUCN status and habit, life forms along with their common uses where most of them are used for the purpose of Forage for livestock and some of them have medicinal uses (Table 1.)

Fig 4: A-*Aristida adscensionis* L. B-*Bambusa arundinacea* var. gigan C-*Cenchrus biflorus* Roxb D-*Cenchrus ciliaris L.* E-*Cenchrus setigerus* Vahl. F-*Chloris barbata* Sw. G-*Chloris bornei* Rang & Tadul H-*Chrysopogon fulvus* (Spreng.) Chlov I- *Coelachyrum lagopoides* (Burm.f.)

Fig 5: J-*Cymbopogon citratus* (DC.) Stapf K-*Cynodon dactylon* (L.) Pers. L-*Dichanthium annulatum* (Forssk.) Stapf. M-*Digitaria stricta* Roth ex. Roem. Et N- *Echinochloa colona* (Kunth) Hitchc. O-*Eleusine indica* (L.) Gaertn. P-*Eragrostis ciliaris* Host Q-*Eustachys petraea* (Sw.) Desv. R-*Leptochlea fusca* (Michx.) Kunth

Table 1: Poaceae plant diversity of Bellary District

Sl no	Scientific name	Habitat	Vernacular name	Habit	Life form	IUCN	Uses
1	*Aristida adscensionis* L.	Moist land	Kaadu nose hullu	Herb	P	NA	Fodder
2	*Bambusa arundinacea* var.gigan	Open land	Bidiru	Tree	P	NA	Arts and crafts
3	*Cenchrus biflorus* Roxb	Sandy soils	Indian sandbur	Herb	A	NA	Fodder
4	*Cenchrus ciliaris L.*	Sandy soils	Buffel grass	Herb	P	LC	Forage
5	*Cenchrus setigerus* Vahl	Open land	Bird wood grass	Herb	P	LC	Fodder
6	*Chloris barbata* Sw.	Dry area	Sevaragu	Herb	P	NA	Medicine
7	*Chloris bornei* Rang &Tadul	Open land	Deccan finger grass	Herb	P	NA	To control erosion and wind break
8	*Chrysopogon fulvus* (Spreng.)Chlov	Open land	Ganjigarike	Herb	A	NA	Fodder
9	*Coelachyrum lagopoides* (Burm.f.)	Moist land	Feather grass	Herb	A	NA	Arts and crafts
10	*Cymbopogon citratus* (DC.)Stapf	Grassland area	Lemon grass	Herb	P	NA	Natural cleanser for skin
11	*Cynodon dactylon* (L.) Pers.	Tropical area	Bermuda grass	Herb	A	NA	Forage
12	*Dichanthium annulatum* (Forssk.) Stapf	Tropical area	Marvel grass	Herb	P	NA	Forage
13	*Digitaria stricta* Roth ex. Roem.et	Tropical area	Crab grass	Herb	A	NA	Forage
14	*Echinochloa colona*(Kunth) Hitchc.	Aquatic and semi-aquatic	German grass	Herb	P	LC	Forage

15	*Eleusine indica* (L.)Gaertn.	Marshy lands	Indian goose grass	Herb	A	NA	Forage
16	*Eragrostis ciliaris* Host	Tropical grasslands	Little lovegrass	Herb	A	NA	Forage
17	*Eustachys petraea* (Sw.) Desv.	Flat land	Rock finger grass	Herb	P	VU	Fodder
18	*Leptochlea fusca* (Michx.) Kunth.	Sandy area	Red sprangle top	Herb	A	LC	Fodder
19	*Leymus cinereus* (Scribn. & Merr.)	Sandy area	Wild rye	Herb	P	NA	Fodder
20	*Microchloa indica* (L.f.) P.Beauv.	Tropical areas	Small grass	Herb	P	NA	Raw material for mattresses
21	*Oryza sativa* L.	Open land	Bhatta	Herb	A	NA	Fodder
22	*Panicum repens* L.	Open land	Branching grass	Herb	P	LC	Fodder
23	*Panicum sumatrens* Roxb	Temperate area	Panic grass	Herb	P	NA	Fodder
24	*Poa annua* L.	Temperate area	Annual Bluegrass	Herb	A	NA	Forage
25	*Setaria italica* (L) P. Beauv	Grassland area	Navane	Herb	P	NA	Forage
26	*Setaria longisetaP.Beauv.*	Temperate area	Bristle foxtail grass	Herb	P	NA	Food
27	*Setaria viridis (L) P. Beauv*	Temperate area	Green foxtail	Herb	A	LC	Fodder
28	*Sporobolus aculeatus* (L.) P.M. Peterson	Shady area	Sharp leaved grass	Herb	A	LC	Gardening uses
29	*Tetrapogon roxburghinia* Schult.	Wet land	Plume grass	Herb	P	LC	Forage
30	*Trachys muricata* (L.) Pers. ex. Trin.	Tropical area	Indian rough grass	Herb	A	LC	Fodder
31	*Urochloa setigera* (Retz.) Stapf	Tropical area	Signal grass	Herb	P	NA	Forage
32	*Zea mays* L.	Tropical area	Makke jola	Herb	P	NA	Food crop

*__Note: IUCN status-__LC=Least concern, NA=Not applicable, VU=Vulnerable, __Habit-__ H=Herb, T=Tree, __Life Forms-__ P=Perennials, A=Annuals

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Conclusion
This study has demonstrated the significance of the Poaceae family in various ecosystems, highlighting their diversity, adaptability, and importance in supporting biodiversity. Through our research, we have gained a deeper understanding of the morphological, anatomical, and molecular characteristics of Poaceae species, as well as their ecological roles in different environments. Grasses represent a rich and enduring resource that has shaped human culture, industry, and art throughout history. From ancient civilizations to modern innovations, these plants have provided natural benefits that not only artworks, cosmetics, and medicinal preparations. The future of Grass plants promises continued innovation and integration into diverse sectors such as healthcare, fashion. In recent years it is updating as Advances in biotechnology, agricultural practices. Further research is needed to fully explore the potential of Poaceae species and address the challenges facing their conservation and sustainable use. By continuing to investigate this fascinating family of plants, we can unlock new opportunities for ecological, agricultural, and biotechnological advancements.

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