Inventory and Ecological Evaluation of Grasses (Poaceae) of Abheda Biological Park, Kota, Rajasthan, India

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Article

Inventory and Ecological Evaluation of Grasses (Poaceae) of Abheda Biological Park, Kota, Rajasthan, India

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Abstract

The present study documents the diversity and ecological attributes of grass species (family Poaceae) recorded from Abheda Biological Park (ABP), Kota, Rajasthan. Floristic surveys conducted between July 2024 and December 2025 resulted in the documentation of 42 grass species. Species were evaluated based on life span (annual/perennial) and palatability, which are key indicators of grassland stability and forage potential. The dominance of palatable (65.8%) and perennial (53.6%) species suggests that ABP supports a productive and ecologically balanced grassland system. Herbarium specimens of selected taxa were prepared to ensure taxonomic accuracy and future reference. The study provides baseline information crucial for grassland management and conservation planning in southeastern Rajasthan.

Keywords: Poaceae; grass diversity; palatability; herbarium; grassland ecology; Kota; Rajasthan

Introduction

Grasslands are among the most important terrestrial ecosystems, contributing significantly to biodiversity conservation, nutrient cycling, soil stabilization, and carbon sequestration (Misra 1989). Grasses belonging to the family Poaceae dominate these ecosystems and serve as the primary forage base for herbivorous fauna. (Barbhuiya, H.A., B.K. Dutta, A.K. Das & A.K. Baishya 2013).

Abheda Biological Park (ABP), located on the Hadoti Plateau of southeastern Rajasthan, represents a heterogeneous landscape comprising open grasslands, dry deciduous forest patches, wetlands, and disturbed habitats (Joy, B.A. 1992). Despite its ecological importance and protected status, systematic studies on grass diversity from ABP are limited. Floristic inventories of grasses are essential for understanding grassland structure and for developing effective habitat management strategies (Singh & Pandey 2003 ; SONU KUMAR, & Om Prakash Bairwa 2025).

The present study aims to document the grass flora of ABP and assess their ecological characteristics based on life span and palatability.

Materials and Methods

Grass species were surveyed in Abheda Biological Park, Kota, Rajasthan, from July 2024 to December 2025 using an opportunistic sampling method. Species were recorded whenever encountered during repeated field visits conducted across different seasons and habitat types, including open grasslands, forest edges, wetland margins, and disturbed sites.

Representative specimens of selected species were collected and processed following standard herbarium preparation techniques, including pressing, drying, mounting, and labeling. Herbarium specimens were preserved for taxonomic verification and future reference. Species identification was based on morphological characters and confirmed using standard regional floras (Misra 1989; Singh & Pandey 2003; Khandelwal & Mathur 2022; Sreekumar, P.V & V.J. Nair 1991). Recorded species were

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categorized according to life span (annual or perennial) and palatability, and the data were analyzed using descriptive statistics.

Results and Discussion

A total of 42 grass species (Table 1), all belonging to the family Poaceae, were documented from Abheda Biological Park. Analysis of ecological attributes revealed distinct patterns in terms of palatability and life span, reflecting the functional structure of the grassland ecosystem.

Out of the total recorded species, 27 species (65.8%) were identified as palatable, while 15 species (34.1%) were unpalatable. The dominance of palatable grasses indicates a high-quality forage base capable of supporting herbivorous wildlife. Frequently observed palatable species included Cynodon dactylon, Dicanthium annulatum, Heteropogon contortus, Eleusine indica, and Digitaria ciliaris. These species are well known for their nutritional value, grazing tolerance, and adaptability to semi-arid climatic conditions, and their prevalence suggests favorable habitat conditions within the park (Kumar & Yadav 2021).

In terms of life span, 23 species (53.6%) were perennial, while 19 species (46.3%) were annual. The slightly higher proportion of perennial grasses contributes to long-term ecosystem stability through continuous ground cover, soil binding, and sustained biomass availability (SONU KUMAR, & Om Prakash Bairwa 2025). Annual grasses, on the other hand, play a crucial role in seasonal productivity by rapidly colonizing open spaces during the monsoon period and enhancing short-term forage availability.

Although unpalatable grasses such as Aristida funiculata, Saccharum spontaneum, and Cymbopogon citratus are less preferred by grazers, their ecological significance cannot be overlooked (SONU KUMAR, & Om Prakash Bairwa 2025). These species contribute to habitat heterogeneity, regulate grazing pressure on palatable species, and provide shelter and resources for insects and other microfauna. Unpalatable grasses are also known to function as pioneer species in disturbed habitats and play an important role in ecological succession (Misra 1989).

The combined presence of palatable and unpalatable species, along with a balanced representation of annual and perennial life forms, indicates that the grassland ecosystem of Abheda Biological Park is structurally diverse and functionally resilient. The preparation of herbarium specimens further strengthens the reliability of the inventory by ensuring accurate species identification and providing permanent reference material.

Table 1. Grass species checklist of Abheda biological park.

S.N.	Family	Botanical name	Common name	Life trend	Palatability
1	Poaceae	*Acrachne racemosa*	• ΰ∏þ° ρæ	A	Palatable
2	Poaceae	*Apluda mutica*	≥ǻπ €™β/≥ǻπ €™	P	Palatable
3	Poaceae	*Aristida adscensionis*	π ρ≤π ρ	A	Unpalatable
4	Poaceae	*Aristida funiculate*	π ρŁůύ π ρ≤π ρ	A	Unpalatable
5	Poaceae	*Arundo donax*	æ∏ûÏ™β	P	Unpalatable
6	Poaceae	*Bambusa balcooa*	∞± ∫¥ρæ	P	Unpalatable
7	Poaceae	*Aristida funiculate*	π ρ≤π ρ	A	Unpalatable
8	Poaceae	*Chloris barbata*	y ≤Ï ° ρæ	P	Palatable
9	Poaceae	*Chloris virgata*	y ≤Ï ° ρæ	P	Palatable
10	Poaceae	*Chrysopogon zizanioiides*	ü æ-ü æ	P	Unpalatable

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11	Poaceae	*Cymbopogon citrates*	† ï¿½ (Lemon grass)	P	Unpalatable
12	Poaceae	*Cynodon dactylon*	Ø° æ	P	Palatable
13	Poaceae	*Dactyloctenium aegyptium*	∂ û ™ß° æ	A	Palatable
14	Poaceae	*Desmostachya bipinnata*	™µ	P	Unpalatable
15	Poaceae	*Dicanthium annulatum*	y ï ± ° æ	P	Palatable
16	Poaceae	*Dicanthium foveolatum*	û ∏e° æ/¥ƒ∏Þ° æ	P	Palatable
17	Poaceae	*Digitaria ciliaris*	Finger grass	A	Palatable
18	Poaceae	*Dinebra retroflexa*	æ∏£®∂ ρºª π ∫° æ	P	Palatable
19	Poaceae	*Echinochloa colona*	æß ρ	A	Palatable
20	Poaceae	*Eleusine indica*	¥π ∏• , ± ° Øω∂ û ς	A	Palatable
21	Poaceae	*Eragrostis artrovirens*	Thalia Lovegrass	A	Unpalatable
22	Poaceae	*E. japonica*	Ŷ§ § ±ς° æ	A	Unpalatable
23	Poaceae	*E. pilosa*	£ œς° æ	A	Palatable
24	Poaceae	*E. tenella*	Indian love, £ œς° æ	A	Palatable
25	Poaceae	*E. unioloides*	Chinese Lovegrass	A	Unpalatable
26	Poaceae	*Eriochloa procera*	æf ρ £ œς£ ß π	A	Palatable
27	Poaceae	*Heteropogon contortus*	û ∂ï fi , º ß ° æ	P	Palatable
28	Poaceae	*Isachne globosa*	§ ý®υ û ∫®û ï	P	Palatable
29	Poaceae	*Ischaemum rugosum*	æ ρ∏∂ úπ ρ	A	Unpalatable
30	Poaceae	*Iseilema anthephoroides*	† ïØ° æ	P	Palatable
31	Poaceae	*Melanocenchris jacquemontii*	Black desert millet	A	Palatable
32	Poaceae	*Oryza rufipogon*	• ï π υ∞ρ±	P	Palatable
33	Poaceae	*Paspalum distichum*	Knot grass	A	Unpalatable
34	Poaceae	*Saccharum spontaneum*	û ∂ë	P	Unpalatable
35	Poaceae	*Schoenefeldia gracilis*	≠π ª ∂∏° æ	A	Palatable
36	Poaceae	*Sehima nervosum*	æ û | ° æ	P	Palatable
37	Poaceae	*Setaria pumila*	§ ý®υ ¥š π υ	A	Palatable
38	Poaceae	*Setaria verticillata*	¥ œς ¥š π υ	P	Palatable
39	Poaceae	*Sorghum halepense*	¥H	P	Unpalatable
40	Poaceae	*Tetrapogon tenellus*	Ŷ®≤ς° æ	A	Palatable
41	Poaceae	*Themeda quadrivalvis*	† ïØ°	A	Palatable
42	Poaceae	Urochlo adeflexa	£ œς£ ß π	A	Palatable

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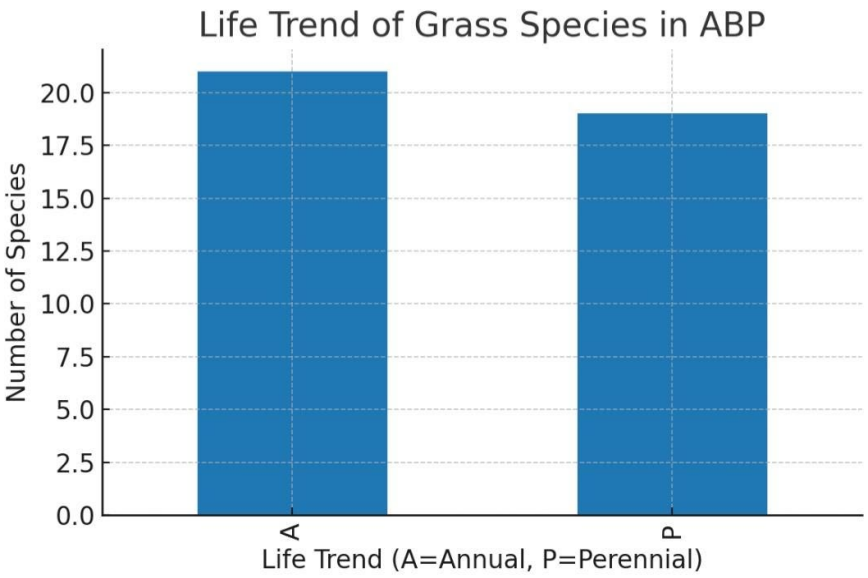

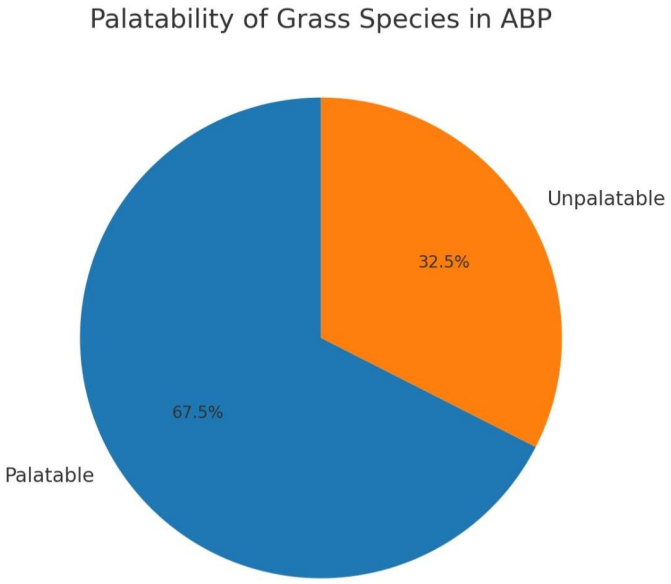

Conclusion

The present study provides a comprehensive account of grass diversity and ecological characteristics in Abheda Biological Park. The dominance of palatable and perennial grasses highlights the ecological stability and forage potential of the park's grasslands. The findings, supported by herbarium records, offer valuable baseline data for grassland management, wildlife habitat improvement, and conservation planning. Continued monitoring and detailed studies on seasonal biomass and nutritional attributes of grasses are recommended to support long-term conservation strategies.

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