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Biodiversity Assessment of Angiosperms in Semi-Natural Grasslands of Champa Region

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ORIGINAL ARTICLE

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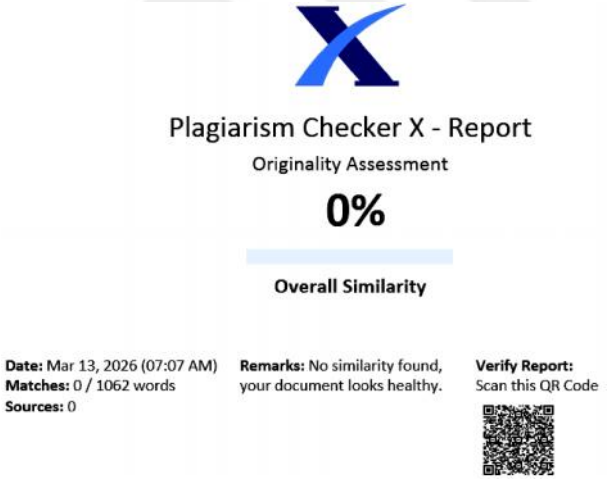

ABSTRACT

Semi-natural grasslands are key reservoirs of plant biodiversity, providing ecosystem services such as soil stabilization, carbon sequestration, and habitat for pollinators. This study evaluates the species composition, diversity indices, and distribution patterns of angiosperms in semi-natural grasslands around the Champa region (Chhattisgarh, India). Sampling was conducted across 10 quadrats (1 m² each) during the post-monsoon season (September–November 2025). A total of 78 angiosperm species belonging to 32 families were identified. Fabaceae, Poaceae, and Asteraceae were the most dominant families. The results highlight the ecological significance of grassland habitats in supporting plant diversity and emphasize the need for conservation management to mitigate anthropogenic disturbances.

KEY WORDS

Angiosperms, Semi-Natural Grasslands, Biodiversity.

INTRODUCTION

Grasslands, often neglected in biodiversity studies, harbor a unique assemblage of plant species, especially angiosperms (Kumar et al., 2019). In India, semi-natural grasslands occur as remnants of historic grazing and disturbance regimes and are characterized by a mix of native and opportunistic species (Singh & Singh, 2017). The Champa region supports extensive semi-natural grasslands influenced by tropical monsoon climate and anthropogenic pressures such as grazing and land conversion. However, systematic studies on angiosperm diversity in these grasslands are limited. Assessing biodiversity is fundamental for

ecological research, conservation planning, and sustainable land management (Gaston, 2018).

Objectives

- To document the angiosperm species composition in semi-natural grasslands.
- To assess diversity using quantitative indices.
- To understand the ecological distribution patterns of dominant families.

Materials and Methods

Study Area

The study was carried out in semi-natural grasslands surrounding Champa (approx. 21.85° N, 82.62° E), Chhattisgarh, India. The climate is tropical monsoon with marked wet (June–September) and dry (October–May) seasons.

Sampling Design

Vegetation sampling was conducted between September and November 2025, coinciding with peak vegetative growth. Ten sample plots (1 m^2 each) were laid out using stratified random sampling across representative grassland patches.

Data Collection

Within each quadrat, all angiosperms were recorded and identified to species level using standard floras (Jain & Rao, 1977). Voucher specimens were collected and deposited at the college herbarium.

Results

Species Composition

A total of 78 angiosperm species belonging to 28 families and 71 genera were observed (Table 1).

The most species-rich families were:

- Poaceae (12 species)
- Fabaceae (10 species)
- Asteraceae (7 species)

Other families recorded included Euphorbiaceae, Cyperaceae, Malvaceae, Amaranthaceae, Solanaceae etc.

Distribution Patterns

Dominance-diversity curves revealed a steep initial decline, indicating a few dominant species (e.g., *Cynodon dactylon*, *Desmodium triflorum*) followed by many rare species.

Table 1: Angiosperm Species Recorded from Semi-Natural Grasslands of Champa Region

S.No.	Botanical Name	Family	Habit
01	*Cynodon dactylon*	Poaceae	Grass
02	*Dactyloctenium aegyptium*	Poaceae	Grass
03	*Echinochloa colona* (L.)	Poaceae	Grass
04	*Eragrostis tenella*	Poaceae	Grass
05	*Setaria pumila*	Poaceae	Grass
06	*Chloris barbata*	Poaceae	Grass
07	*Heteropogon contortus*	Poaceae	Grass
08	*Brachiaria ramose*	Poaceae	Grass
09	*Digitaria sanguinalis*	Poaceae	Grass
10	*Panicum antidotale*	Poaceae	Grass

11	*Pennisetum pedicellatum*	Poaceae	Grass
12	*Bothriochloa pertusa*	Poaceae	Grass
13	*Ischaemum rugosum*	Poaceae	Grass
14	*Alysicarpus monilifer (L.) DC*	Fabaceae	Herb
15	*Alysicarpus vaginalis* (L.) DC	Fabaceae	Herb
16	*Cassia occidentalis*	Fabaceae	Shrub
17	*Cassia tora* L.	Fabaceae	Herb
18	*Crotalaria medicagine*a DC.	Fabaceae	Herb
19	*Desmodium triflorum* (L.)	Fabaceae	Herb
20	*Indigofera linifolia* (L.f.) Retz.	Fabaceae	Herb
21	*Mimosa pudica*	Fabaceae	Herb
22	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Herb
23	*Senna sophera*	Fabaceae	Herb
24	*Vigna trilobata* (L.) Verdc.	Fabaceae	Shrub
25	*Tridax procumbens*	Asteraceae	Herb
26	*Eclipta prostrata*	Asteraceae	Herb
27	*Blumea lacera*	Asteraceae	Herb
28	*Parthenium hysterophorus*	Asteraceae	Herb
29	*Vernonia cinerea*	Asteraceae	Herb
30	*Xanthium strumarium*	Asteraceae	Herb
31	*Ageratum conyzoides*	Asteraceae	Herb
32	*Sida acuta*	Malvaceae	Herb
33	*Sida cordifolia*	Malvaceae	Herb
34	*Abutilon indicum*	Malvaceae	Shrub
35	*Urena lobata*	Malvaceae	Shrub
36	*Corchorus aestuans*	Malvaceae	Herb
37	*Malvastrum coromandelianum*	Malvaceae	Herb
38	*Achyranthes aspera*	Amaranthaceae	Herb
39	*Amaranthus viridis*	Amaranthaceae	Herb
40	*Aerva lanata*	Amaranthaceae	Herb
41	*Chenopodium album*	Amaranthaceae	Herb
42	*Celosia argentea*	Amaranthaceae	Herb
43	*Euphorbia hirta*	Euphorbiaceae	Herb
44	*Euphorbia thymifolia*	Euphorbiaceae	Herb
45	*Croton bonplandianus*	Euphorbiaceae	Herb
46	*Phyllanthus niruri* L.	Euphorbiaceae	Herb
47	*Pergularia daemia*	Apocynaceae	Climber
48	*Ipomoea pes-tigridis*	Convolvulaceae	Climber
49	*Ipomoea carnea*	Convolvulaceae	Shrub
50	*Evolvulus nummularius*	Convolvulaceae	Herb
51	*Cyperus rotundus*	Cyperaceae	Sedge
52	*Cyperus compressus*	Cyperaceae	Sedge
53	*Fimbristylis dichotoma*	Cyperaceae	Sedge
54	*Ruellia tuberosa*	Acanthaceae	Herb

55	*Justicia adhatoda*	Acanthaceae	Shrub
56	*Cleome viscosa*	Cleomaceae	Herb
57	*Portulaca oleracea*	Portulacaceae	Herb
58	*Boerhavia diffusa*	Nyctaginaceae	Herb
59	*Ocimum americanum*	Lamiaceae	Herb
60	*Leucas aspera*	Lamiaceae	Herb
61	*Hyptis suaveolens*	Lamiaceae	Shrub
62	*Physalis minima*	Solanaceae	Herb
63	*Solanum virginianum*	Solanaceae	Herb
64	*Tribulus terrestris*	Zygophyllaceae	Herb
65	*Argemone mexicana*	Papaveraceae	Herb
66	*Commelina benghalensis*	Commelinaceae	Herb
67	*Lantana camara*	Verbenaceae	Shrub
68	*Ziziphus nummularia*	Rhamnaceae	Shrub
69	*Lepidium sativum*	Brassicaceae	Herb
70	*Heliotropium indicum*	Boraginaceae	Herb
71	*Polygonum plebeium*	Polygonaceae	Herb
72	*Rumex dentatus*	Polygonaceae	Herb
73	*Scoparia dulcis*	Plantaginaceae	Herb
74	*Scoparia dulcis*	Plantaginaceae	Herb
75	*Trianthema portulacastrum*	Aizoaceae	Herb
76	*Oxalis corniculata*	Oxalidaceae	Herb
77	*Cardiospermum halicacabum*	Sapindaceae	Climber
78	*Coccinia grandis*	Cucurbitaceae	Climber

Discussion

The relatively high diversity values reflect the ecological richness of semi-natural grasslands in Champa. Poaceae and Fabaceae dominance agree with grassland ecology studies where grasses efficiently and legumes exploit open habitats (Tilman & Lehman, 2001). The presence of rare species suggests that even disturbed grasslands can be important biodiversity refuges. Human activities such as grazing and land conversion may influence species composition by favoring disturbance-tolerant taxa. Conservation measures such as controlled grazing and habitat restoration could help preserve biodiversity.

CONCLUSION

The Champa grasslands support considerable angiosperm diversity, highlighting their ecological significance. This research provides baseline data that can inform conservation planning and grassland management strategies. Future research should integrate seasonal dynamics and soil–plant interactions for comprehensive ecological insights.

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