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RESEARCH ARTICLE

Pattern of Plant Species Diversity in Grasslands of Rajasthan, India

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ABSTRACT: Quantitative data on patterns of distribution and diversity of grasslands is necessary for conservation planning and sustainable utilization. This is the first study to document and analyse the phytosociological data of grasslands of entire Rajasthan state, India. The data was collected through stratified random sampling method by laying 515 sample plots. The study found 375 species belonging to 188 genera and 46 families. Species diversity (Shannon-Weiner diversity) in seven grassland community types ranged between 2.59 and 3.18. The highest Shannon-Weiner diversity index (H'= 3.18) was found in *Aristida-Dichanthium* grassland followed by *Sehima-Apluda* grassland (H' = 3.17). The Simpson diversity index and Similarity index are quite different from each other reveals the uniqueness of these grasslands types. Based on our analysis we are concluding that, saline grasslands and swampy grasslands are narrow-niched and ecologically unique. Analysis showed grasslands of Rajasthan as highly species diverse communities and requires prioritization in the long term conservation planning.

KEY WORDS: Aravallis, desert, grasslands, India, phytosociology, Rajasthan.

INTRODUCTION

Tropical grasslands are present nearer to the equator and characterized by the presence of hot weather throughout the year (Coupland, 1978). Conservation of grassland is necessary to maintain biodiversity and to provide nutritious forages and to arrest desertification. Grassland vegetation differs from forests in that the above ground vegetation is completely renewed each year. The length of growing season in tropical grasslands is determined by duration of rainy season. The increasing human and livestock populations have caused a serious stress on the grassland resources. Investigation of species composition and sociological interaction of species in communities are integral part of vegetation ecology (Mueller-Dombois and Ellenberg, 1974). It is necessary to conduct the phytosociological studies to understand the current status of vegetation, species richness, diversity, explain or predict its pattern, relationships, classification and distribution of plant communities for proper planning and conservation (Jayakumar et al., 2002; Ilorkar and Khatri, 2003). Being located in arid and semi-arid part of India, Rajasthan represents very high area (9,829 km^2) under grasslands which occupies 2.9% of total geographical area of State (Reddy et al., 2011). So far, there is no comprehensive phytosociological study on grassland ecosystems of Rajasthan have been undertaken. A few floristic studies are however, available from the different parts of Rajasthan (Katewa, 1996; Sharma and Upadhyaya, 2002; Galav et al., 2005; Mertia et al., 2006). The objective of the present study was to generate baseline information on the distribution patterns and composition of the species of grasslands of entire Rajasthan State in order to support long term conservation strategies and species level monitoring.

MATERIALS AND METHODS

Study area

Rajasthan in unique state which shows great contrast from one area to another is noticeable in respect of climate, altitude and vegetation. Rajasthan is the largest state in India, occupying an area of about 3,42,239 sq km nearly about 11 percent of total area of India, and lies between 23º30' and 30º12' North latitude and 69º30' and 78º17' East longitude. Rajasthan is bordered by Pakistan in the west and northwest, the states of Punjab, Uttar Pradesh and Haryana in the north and northeast. The state of Madhya Pradesh lies in the southeast and Gujarat in the southwest (Fig. 1). Administratively, the State is divided into 33 districts (Ajmer, Alwar, Banswara, Baran, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittorgarh, Churu, Dausa, Dholpur, Dungarpur, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhalawar, Jhunjhunu, Jodhpur, Karauli, Kota , Nagaur, Pali, Pratapgarh, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Sri Ganganagar, Tonk and Udaipur).

The most striking geographical feature is the Aravalli range-the oldest folded mountain range in the

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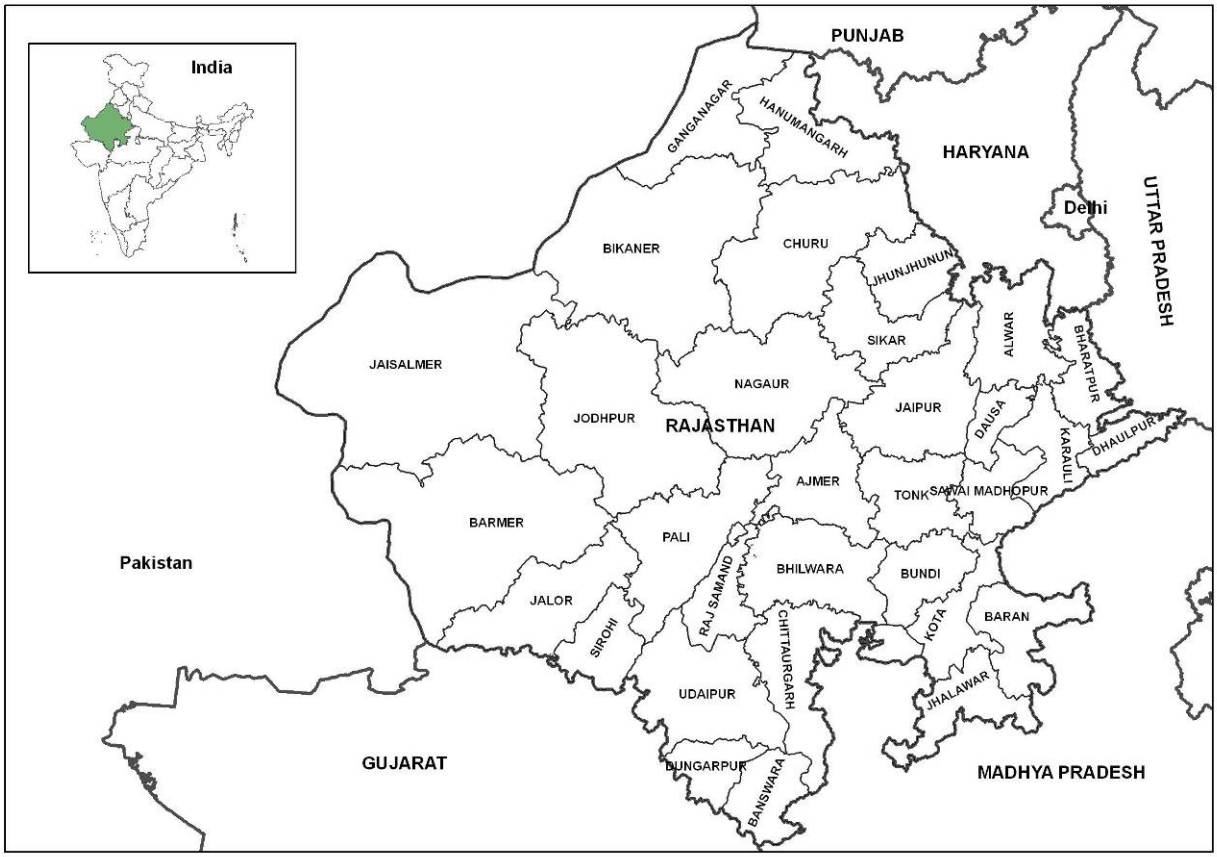


Fig. 1. Map of study area (Rajasthan, India)

world, which intersects the state diagonally end to end north-east to south-west into three-fifth north-western desertic zone and two-fifth eastern semi-arid region. Grasslands have mostly occurred continuously in Desert regions, while in Aravallis they are found as fragments embedded in other types of vegetation. Occasionally tree/shrub savannah and scrublands were associated in the fringes of grasslands. The population of the State is 68.6 million (Census, 2011). Rajasthan experiences varied climatic conditions ranging from extreme aridity in the northwestern parts to sub-humid conditions in the southern parts. However, most of the state (94.0%) falls under arid and semi-arid conditions with low and erratic rainfall patterns. Pre-monsoon season extends from April to June, is the hottest period, with temperatures ranging from 32°C to 45°C (Shetty and Singh, 1987). The total forest area of the State is 16,087 km^2, which occupies 4.70% of the total geographical area (FSI, 2011). There are seven grassland communities were identified in Rajasthan using multi-season satellite data (Reddy et al., 2011). Of the total grassland area of Rajasthan, *Cenchrus-Dactyloctenium* grassland is the predominant community occupies 5430.01 km^2 (55.25%) followed by *Lasiurus-Panicum* grassland 3339.45 km^2 (33.98%), *Sehima-Apluda* grassland 667.28 km^2 (6.79%), *Aristida-Dichanthium* grassland 283.59 km^2 (2.89%), *Aristida-Oropetium* grassland 80.15 km^2 (0.82%), Saline grassland 25.36 km^2 (0.26%), Swampy grassland 2.80 km^2 (0.03%) (Reddy et al., 2011) (Fig. 2).

Field sampling

Phytosociological studies have been carried out to estimate species richness, species diversity and similarity among the grassland types during post monsoon (September to December) season of 2009 and 2010 (Fig. 3). Stratified random samples were generated based on grassland type map of Rajasthan (Reddy et al., 2011). Accordingly sample plot data was collected from 515 square quadrats (each 1 × 1 m) and analysed in the study. The number of sample plots allocated in seven grassland community types varies from 15 to 134 (*Lasiurus-Panicum* grassland: 67; *Cenchrus-Dactyloctenium* grassland: 134; *Aristida-Oropetium* grassland: 62; *Sehima-Apluda* grassland: 108; *Aristida-Dichanthium* grassland: 106; Saline grassland: 23 and Swampy (fresh water swampy) grassland: 15). Localities of sample plots were recorded using GPS. Voucher

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Table 1. Species diversity of Grassland types of Rajasthan

Sl.no.	Class	Species	Genera	Families	H'	Simpson Index
1	*Lasiurus-Panicum* grassland	95	55	26	3.03	0.34
2	*Cenchrus-Dactyloctenium* grassland	145	82	30	3.11	0.41
3	*Aristida-Oropetium* grassland	86	66	28	2.59	0.43
4	*Sehima-Apluda* grassland	181	120	33	3.17	0.26
5	*Aristida-Dichanthium* grassland	188	134	35	3.18	0.45
6	Saline grassland	32	26	16	3.00	0.23
7	Swampy grassland	29	18	11	2.95	0.44
	Sub total	375	188	46		

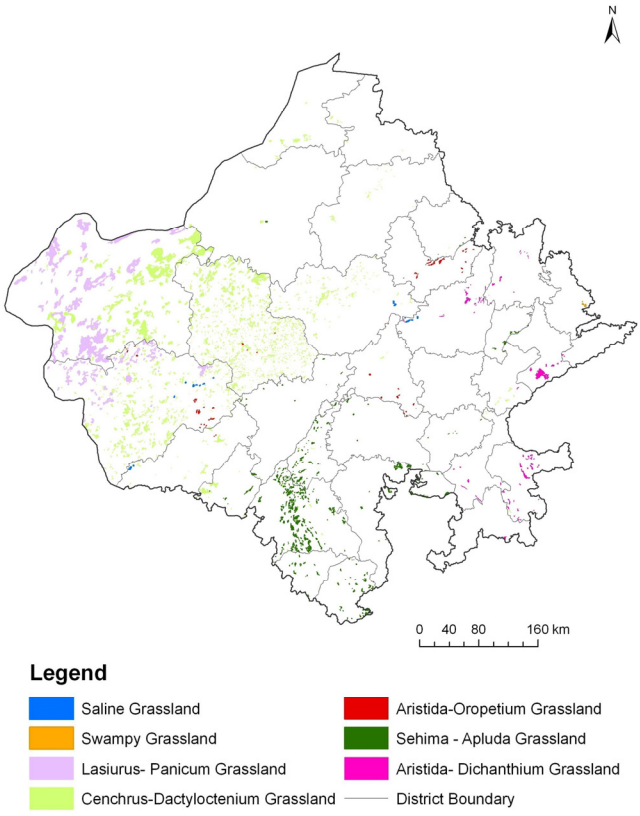


Fig. 2. Grassland map of Rajasthan

specimens were deposited at BSI, Jodhpur and ML Sukhadia University, Udaipur. Apart from field identification, the names of species were further confirmed with the Flora of Rajasthan (Shetty and Singh, 1993) and PLANTLIST database (www.theplantlist.org).

Data analysis

Species accumulation curve for grassland community types was presented in Fig. 4. Importance Value Index (IVI) depicts the sociological structure of a species in its totality in the community. IVI as a function of relative density, relative frequency and relative abundance was calculated to know dominance and association of species (Table 3, Fig. 5a, 5b and 5c). Based on the IVI values the predominant 2–5 species were considered as representatives of grassland communities. Shannon and Weiner index was calculated as per Shannon and Weiner (1963) and Simpson index was calculated as per Magurran (2004). Proportion of species of grasses, legumes and other herbs (forbs) were evaluated to find out the biological distinction of seven grassland communities. Similarity between the communities was determined using Sorenson's index of similarity based on incidence of occurrence (Sorenson, 1948).

RESULTS

Species Richness and Diversity

Altogether 375 species belonging to 188 genera and 46 families were recorded from grasslands of Rajasthan (Appendix 1, Table 1). The predominant grasses at state level are *Aristida funiculata, Cenchrus biflorus, Dichanthium pertusum, Heteropogon contortus* and *Lasiurus scindicus*. The group of predominant species varied between grassland communities. Shannon-Weiner diversity in seven grassland community types ranged between 2.59 and 3.18. Analysis indicated high species diversity (H'= 3.18) in *Aristida-Dichanthium* grassland represented by 188 species, 134 genera and 35 families followed by *Sehima-Apluda* grassland (3.17) with 181 species 120 genera and by 33 families, then *Cenchrus-Dactyloctenium* grassland (3.01) with 145 species by 82 genera and 30 families. The species with highest IVI in *Lasiurus-Panicum* grassland were *Lasiurus scindicus* (63.6) nearly double that of the next higher, *Panicum turgidum* (32.9). Following these were *Ochthochloa compressa* (17.3), *Indigofera cordifolia* (12.6) and *Aerva persica* (6.9). The top five species in seven grasslands communities were responsible for 55.6% to 133.3% of the total IVI obtained in the individual types. The top five species in *Cenchrus-*

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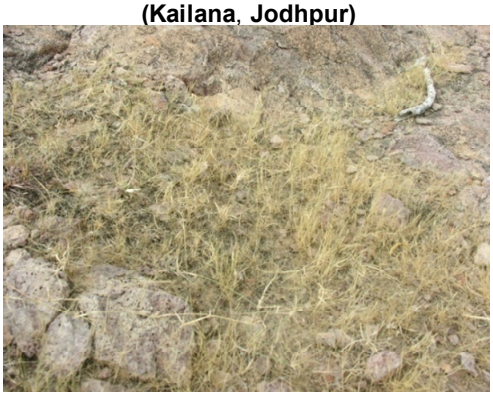
Lasiurus-Panicum
(Jaisalmer)



Cenchrus-Dactyloctenium
(Barmer)



Aristida-Oropetium
(Kailana, Jodhpur)



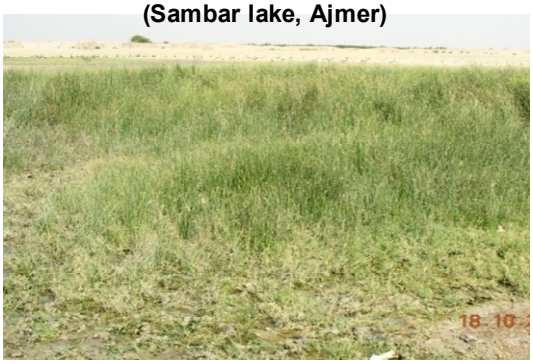
Sehima-Apluda
(Rajsamand to Udaipur)



Aristida-Dichanthium
(Ranthambore tiger reserve)



Saline grassland
(Sambar lake, Ajmer)



Swampy grassland
(Keoladeo Ghana National Park, Bharatpur)



Fig. 3. Grassland community types of Rajasthan.

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Table 2. Species of grasses, legumes and forbs along with their population density

Sl.no.	Class	Grasses	Legumes	Forbs	% of grass density	% of legume density	% of forbs density
1	*Lasiurus-Panicum* grassland	36	12	47	84.6	7.3	8.1
2	*Cenchrus-Dactyloctenium* grassland	48	17	80	57.1	11.0	31.9
3	*Aristida-Oropetium* grassland	33	7	46	86.7	1.2	12.1
4	*Sehima-Apluda* grassland	68	17	96	81.6	4.7	13.7
5	*Aristida-Dichanthium* grassland	69	16	103	70.5	9.0	20.5
6	Saline grassland	7	3	22	53.5	0.4	46.1
7	Swampy grassland	11	3	15	85.0	2.4	12.6
	Total	131	35	209	75.3	6.6	18.1

Dactyloctenium grassland contributes 218.4% of IVI followed by Saline grasslands (164.9), swampy grasslands (158.7), *Aristida-Oropetium* Grassland (138.9), *Lasiurus-Panicum* grassland (133.3), *Sehima-Apluda* grassland (88.5) and *Aristida-Dichanthium* grassland (55.6) indicates high resource sharing and predominance of few species (Table 3).

Simpson index for all grassland types shows value of <0.5 infer gregarious occurrence of dominant species. Simpson's concentration of dominance index has predicted the heterogeneity of seven communities and the values ranged between 0.23–0.44. This value gives the probability of randomly chosen two individuals belonging to the same species. The low value of 0.23 in saline grassland indicates the system being highly heterogeneous than the *Aristida-Dichanthium* grassland (0.45).

Species Density

Species density is a quantitative indicator of the numerical strength of species growing in an area. The highest density was recorded in *Lasiurus-Panicum* grassland (115 individuals/m^2) followed by *Aristida-Dichanthium* grassland (101), *Sehima-Apluda* grassland (100), *Aristida-Oropetium* grassland (85), *Cenchrus-Dactyloctenium* grassland (60), Swampy grassland (41) and Saline grassland (34).

Proportion of grasses, legumes and forbs

All grassland community types show high number of species of forbs, but their representation was found to be less than 50% of population density of various grass species (Table 2). *Aristida-Oropetium* grassland has highest (86.7%) cumulative percentage of individuals of all species followed by Swampy grassland (85%) and *Lasiurus-Panicum* grassland (84.6%). Forbs represent 46.1% of total population in saline grassland. Legumes occupy 11% of population in *Cenchrus-Dactyloctenium* grassland.

Similarity index

The index value shows that less than 30% of species are common or shared by the grassland types. High similarity (29%) was found between *Aristida-Dichanthium* grassland and *Sehima-Apluda* grassland types (Table 4). Saline grasslands are unique ecosystems and do not share any species common with other grasslands. In case of swampy grasslands only *Cynodon dactylon* (Indian doob grass) is the ubiquitous species and found scattered in *Aristida-Dichanthium* grassland and *Sehima-Apluda* grassland.

Rarity of species

Singletons and doubletons were considered as rare and form about 11% (42 species) of the total sampled area of Rajasthan. Rarity of species varies between seven grasslands. The highest rarity was recorded in Saline grassland (28%), Swampy grassland (24%), *Cenchrus-Dactyloctenium* grassland (21%), *Lasiurus-Panicum* grassland (20%), *Aristida-Oropetium* grassland (18%), *Sehima-Apluda* grassland (17%) and *Aristida-Dichanthium* grassland (11%). The species rarity in Rajasthan was found to be low as compared to different areas of Western Ghats, e.g. Pascal and Pelissier, 1996 (40%) and Parthasarathy and Karthikeyan, 1997 (47%).

DISCUSSION

The grasslands of Rajasthan have been broadly categorized as dry grasslands by Champion and Seth (1968). The Shannon, Simpson diversity indices and Similarity index of grasslands types are quite different from each other reveals the uniqueness of these vegetation systems. *Lasiurus scindicus* grasslands are climax vegetation systems adapted to very low rainfall (annual < 300mm) areas of Thar desert. *Lasiurus scindicus* (king of desert grasses) and *Panicum turgidum* are predominant species in this system and found *in loose sandy soils.*

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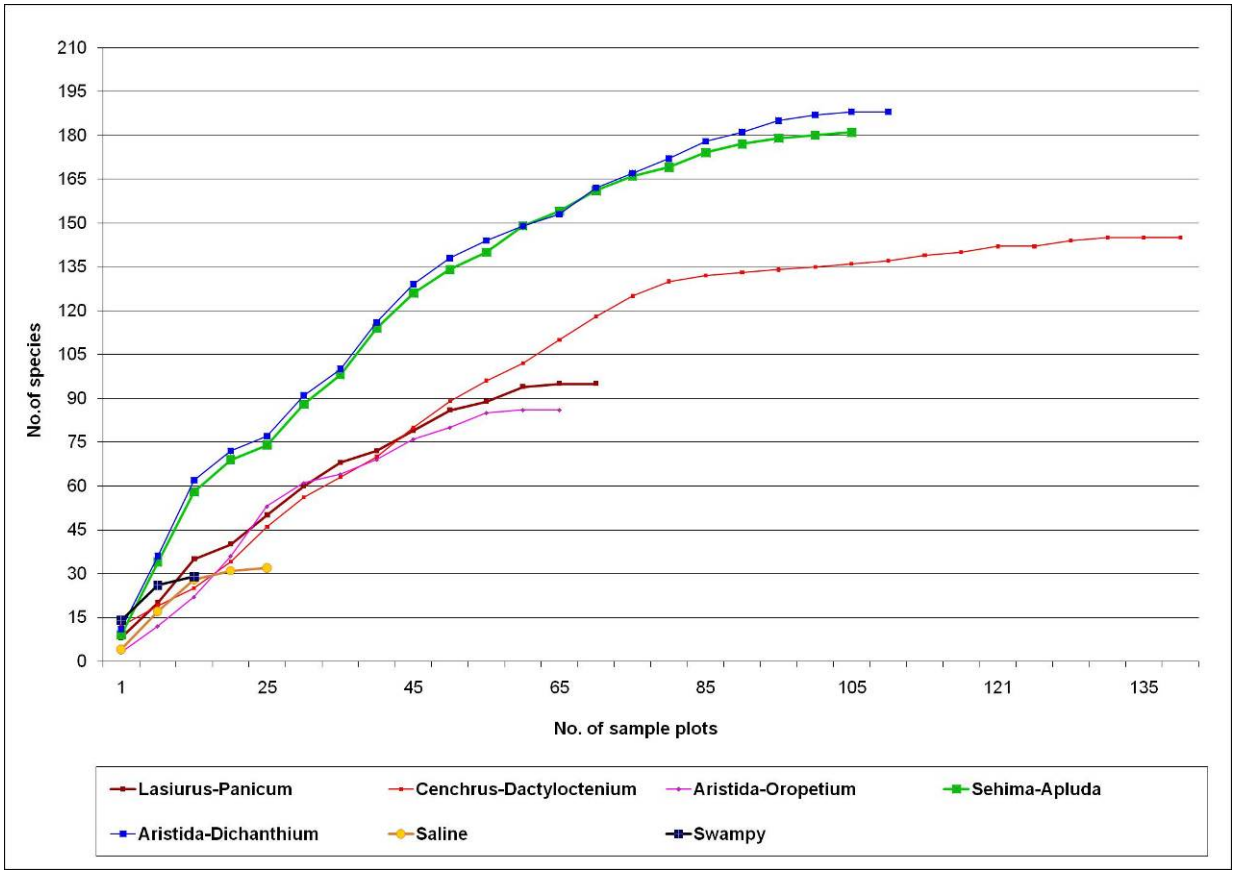


Fig. 4. Species accumulation curve for grasslands of Rajasthan

Lasiurus scindicus represents very high importance value index (63.6) among *Lasiurus-Panicum* grassland (Table 3). The study conducted in three sites of Jaisalmer district provides clear picture of grazing pressure (Mertia et al., 2006). Site I with no grazing had 9200 tussocks/ha, Site II with controlled grazing had 8300 tussocks/ha and Site III with open (uncontrolled) grazing had only 5700 tussocks/ha. *Cenchrus-Dactyloctenium* grassland shows dominance of both grass (*Cenchrus biflorus, Dactyloctenium scindicum, Aristida adscensionis*) and non grass species (*Farsetia hamiltonii, Crotalaria burhia, Tribulus terrestris, Tephrosia purpurea, Aerva persica, Indigofera cordifolia*). It was distributed throughout central and eastern part of Rajasthan desert. This grassland receives annual rainfall of 300 mm to 550 mm.

Aristida-Oropetium grasslands are edaphically adapted to rocky gravelly areas of Jodhpur, Ajmer, Nagaur, Sikar and Chittaurgarh districts. It is very low productive grassland in terms of biomass due to very start stature (< 15 cm height) and low species diversity. *Sehima-Apluda* grasslands are dominant in southern Aravallis. *Sehima nervosum* is the indicator species of grasslands in southern Aravallis. The grass species i.e. *Heteropogon contortus, Aristida adscensionis, Apluda mutica* replaces *Sehima nervosum* in foot hills, plains and hill slopes especially in northern and central Aravallis. The high species diversity in *Aristida-Dichanthium* grassland is attributed to fertile alluvial soils of eastern Aravallis. The species diversity of Terai grasslands of Uttar Pradesh also similar in Shannon-Weiner diversity index and estimated as 4.0 (Shukla, 2009). The study in Himalayan grasslands has estimated Shannon-Weiner diversity index in the range of 1.75 to 2.63 (sub-alpine: 1.75; alpine: 2.50 and in valley plain grasslands: 2.63) (Reshi et al., 2009). *Aristida-Dichanthium* community is prevalent in eastern part of Aravallis. *Chrysopogon fulvus* is the common grass species in east of Aravallis and locally abundant in Ranthambore tiger reserve. The number of species in saline grassland and swampy grassland are low and estimated as 32 and 29 species respectively. It is may be attributed to narrow niche and representation of very low area. Saline grasslands are locale specific vegetation systems occur only in saline tracts of Sambhar lake, Didwana lake and Pachpadra. Swampy grasslands (*Vetiveria* community) are found in marshes

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Table 3. Top five species of Grassland community types of Rajasthan

Sl.no.	Grassland/dominant species	IVI	IV	*Sehima-Apluda* grassland	IVI
1	*Aristida funiculata*	38.0	1	*Sehima nervosum*	27.7
2	*Cenchrus biflorus*	25.8	2	*Apluda mutica*	22.4
3	*Dichanthium pertusum*	24.8	3	*Heteropogon contortus*	12.5
4	*Heteropogon contortus*	22.0	4	*Aristida adscensionis*	18.1
5	*Lasiurus scindicus*	21.8	5	*Cymbopogon martinii*	7.8
I	***Lasiurus-Panicum* grassland**		**V**	***Aristida-Dichanthium* grassland**	
1	*Lasiurus scindicus*	63.6	1	*Aristida funiculata*	22.7
2	*Panicum turgidum*	32.9	2	*Aristida adscensionis*	12.1
3	*Ochthochloa compressa*	17.3	3	*Dichanthium pertusum*	8.8
4	*Indigofera cordifolia*	12.6	4	*Eragrostis ciliaris*	7.6
5	*Aerva persica*	6.9	5	*Tephrosia purpurea*	4.4
II	***Cenchrus-Dactyloctenium* grassland**		**VI**	**Saline grassland**	
1	*Cenchrus biflorus*	62.6	1	*Sporobolus virginicus*	45.8
2	*Crotalaria burhia*	45.5	2	*Eleusine compressa*	34.4
3	*Aerva persica*	41.0	3	*Cressa cretica*	33.3
4	*Farsetia hamiltonii*	38.6	4	*Aeluropus lagopoides*	28.2
5	*Dactyloctenium scindicum*	30.6	5	*Suaeda fruticosa*	23.2
III	***Aristida-Oropetium* grassland**		**VII**	**Swampy grassland**	
1	*Aristida funiculata*	42.4	1	*Vetiveria zizanoides*	92.3
2	*Oropetium thomaeum*	42.0	2	*Cynodon dactylon*	17.7
3	*Melanocenchris jacquemontii*	32.8	3	*Phragmites karka*	17.6
4	*Dactyloctenium aegyptium*	11.0	4	*Saccharum spontaneum*	17.1
5	*Dactyloctenium scindicum*	10.4	5	*Paspalum distichum*	14.0

and fringes of fresh water wetlands in Keoladeo Ghana bird sanctuary.

Conclusions

The present work is an attempt to provide information on phytosociological aspects to understand the species diversity patterns of grasslands of Rajasthan. Some of the best grassland systems observed in Rajasthan includes Desert National Park, Talchapper wildlife Sanctuary, Keoladeo Ghana National Park and Ranthambore Tiger Reserve. There is an urgent need to understand the affect of ongoing anthropogenic pressure on the species diversity of grasslands to prepare long term conservation plans.

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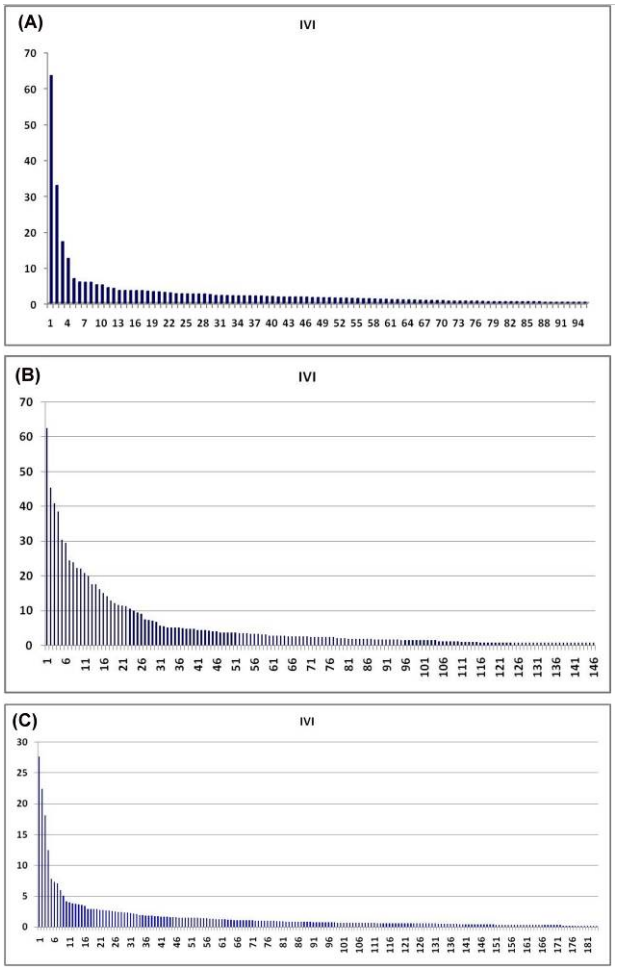


Fig. 5. IVI representation of species of grasslands. A: *Lasiurus-Panicum* Grassland. B: *Cenchrus-Dactyloctenium* grassland. C: *Sehima-Apluda* grassland.

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Appendix 1

(Taxonomic inventory of all the 375 species)

Sl.no.	Species Name	Family	Habit
1	*Acalypha ciliata* Forsk.	Euphorbiaceae	Forb
2	*Acanthospermum hispidum* DC.	Asteraceae	Forb
3	*Achyranthes aspera* L.	Amaranthaceae	Forb
4	*Acrachne racemosa* (Heyne ex Roem. & Schult.) Ohwi	Poaceae	Grass
5	*Actiniopteris radiata* (Koen.) Link.	Actiniopteridaceae	Forb
6	*Aeluropus lagopoides* (L.) Thwaites	Poaceae	Grass
7	*Aerundo donax* L.	Poaceae	Grass
8	*Aerva lanata* (L.) A.L.Juss.	Amaranthaceae	Forb
9	*Aerva persica* (Burm. f.) Merr.	Amaranthaceae	Forb
10	*Aerva pseudotomentosa* Blatt. & Hallb.	Amaranthaceae	Forb
11	*Aerva sanguinolenta* (L.) Blume	Amaranthaceae	Forb
12	*Aeschynomene indica* L.	Papilionaccae	Legume
13	*Ageratum conyzoides* L.	Asteraceae	Forb
14	*Alloteropsis cimicina* (L.) Stapf.	Poaceae	Grass
15	*Alternanthera sessilis* (L.) R.Br. ex DC.	Amaranthaceae	Forb
16	*Alysiarpus monilifer* (L) DC.	Papilionaccae	Legume
17	*Alysicarpus hamosus* Edgew.	Papilionaccae	Legume
18	*Alysicarpus rugosus* (Willd.) DC.	Papilionaccae	Legume
19	*Alysicarpus tetragonolobus* Edges.	Papilionaccae	Legume
20	*Alysicarpus vaginalis* (L.) DC.	Papilionaccae	Legume
21	*Amaranthus hybridus* L.	Amaranthaceae	Forb
22	*Amaranthus spinosus* L.	Amaranthaceae	Forb
23	*Amaranthus viridis* L.	Amaranthaceae	Forb
24	*Ammannia baccifera* L.	Lythraceae	Forb
25	*Ammannia desertorum* Blatt & Hallb.	Lythraceae	Forb
26	*Ammannia multiflora* Roxb.	Lythraceae	Forb
27	*Anagallis arvensis* L.	Primulaceae	Forb
28	*Andrographis paniculata* (Burm.f.) Wall.ex Nees.	Acanthaceae	Forb
29	*Andropogon pumilus* Roxb.	Poaceae	Grass
30	*Anisomeles indica* (L.) Kuntze	Lamiaceae	Forb
31	*Anisomeles malabarica* (L.) R.Br.	Lamiaceae	Shrub
32	*Apluda mutica* L.	Poaceae	Grass
33	*Argemone mexicana* L.	Papavaraceae	Forb

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34	*Aristida adscensionis* L. var. *pumila* (Decne.) Coss. & Dur.	Poaceae	Grass
35	*Aristida adscensionis* L. var. *adscensionis* L.	Poaceae	Grass
36	*Aristida funiculata* Trin. & Rupr.	Poaceae	Grass
37	*Aristida hirtigluma* Steud ex Trin er Rupr.	Poaceae	Grass
38	*Aristida hystrix* L.	Poaceae	Grass
39	*Aristida mutabilis* Trin.&Rupr.	Poaceae	Grass
40	*Aristida pogonoptila* (Jaub. & Spach) Boiss	Poaceae	Grass
41	*Arnebia hispidissima* (Lehm.) DC.	Boraginaceae	Forb
42	*Arthraxon lancifolius* (Trin.) Hochst.	Poaceae	Grass
43	*Arthraxon prionoides* Steud.	Poaceae	Grass
44	*Barleria prionitis* L.	Acanthaceae	Shrub
45	*Bergia ammannioides* Roth. ex Roth	Elantinaceae	Forb
46	*Bidens biternata* (Lour) Merr.	Asteraceae	Forb
47	*Blainvillea acmella* (L) Lam.	Asteraceae	Forb
48	*Blastania fimbristipula* Kotschy & Peyr.	Cucurbitaceae	Climber
49	*Blepharis maderaspatensis* (L.) Hyne ex Roth.	Acanthaceae	Forb
50	*Blepharis molluginifolia* Pers	Acanthaceae	Forb
51	*Blepharis repens* (Vahl.) Roth.	Acanthaceae	Forb
52	*Blumea mollis* (D.Don) Merr.	Asteraceae	Forb
53	*Blumea obliqua* (L) Druce	Asteraceae	Forb
54	*Boerhavia diffusa* L.	Nyctaginaceae	Forb
55	*Boerhavia elegans* Choisy	Nyctaginaceae	Forb
56	*Boerhavia erecta* L.	Nyctaginaceae	Forb
57	*Bonamia latifolia* (Hochst. & Steud.) Sant.	Convolvulaceae	Forb
58	*Borreria articularis* L.f.	Rubiaceae	Forb
59	*Borreria hispida* (Linn.) K. Schum.	Rubiaceae	Forb
60	*Borreria pusilla* (Wall.) DC.	Rubiaceae	Forb
61	*Borreria stricta* Linn.	Rubiaceae	Forb
62	*Brachiaria distachya* (L.) Stapf.	Rubiaceae	Forb
63	*Brachiaria ramosa* (L.) Stapf.	Poaceae	Grass
64	*Brachiaria reptans* (L.) Garder & Hubbard.	Poaceae	Grass
65	*Brachiaria eruciformis* (Sm.) Griseb.	Poaceae	Grass
66	*Capillipedium huegelii* (Hack.) Blatt. & McCann	Poaceae	Grass
67	*Carthamus oxyacantha* M. Bieb.	Asteraceae	Forb
68	*Cassia absus* L.	Caesalpiniaceae	Forb
69	*Cassia italica* (Mill) Lam ex Anderws.	Caesalpiniaceae	Forb
70	*Cassia obtusifolia* L.	Caesalpiniaceae	Shrub

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71	*Cassia occidentalis* L.	Caesalpiniaceae	Shrub
72	*Cassia pumila* Lam.	Caesalpiniaceae	Forb
73	*Cassia senna* L.	Papilionaccae	Legume
74	*Cassia tora* L.	Caesalpiniaceae	Forb
75	*Catharanthus pusillus* (Murr.) G. Don, Gen. Hist	Apocynaceae	Forb
76	*Celosia argentea* L.	Amaranthaceae	Forb
77	*Cenchrus biflorus* Roxb.	Poaceae	Grass
78	*Cenchrus ciliaris* L.	Poaceae	Grass
79	*Cenchrus pennisetiformis* Hochst.& Steud.	Poaceae	Grass
80	*Cenchrus prieurii* var. *prieurii* (Kunth) Marie.	Poaceae	Grass
81	*Cenchrus setigerus* Vahl,	Poaceae	Grass
82	*Chenopodium album* L.	Chenopodiaceae	Forb
83	*Chloris barbata* Sw.	Poaceae	Grass
84	*Chloris dolichostachya* Lag.	Poaceae	Grass
85	*Chloris montana* Roxb.	Poaceae	Grass
86	*Chloris roxburghiana* Schult.	Poaceae	Grass
87	*Chloris virgata* Sw.	Poaceae	Grass
88	*Chrysopogon fulvus* (Spreng.) Chiov.	Poaceae	Grass
89	*Cleome gracilis* Edgew.	Cleomaceae	Forb
90	*Cleome gynandra* L.	Cleomaceae	Forb
91	*Cleome scaposa* DC.	Cleomaceae	Forb
92	*Cleome viscosa* (L.) L.	Cleomaceae	Forb
93	*Coldenia procumbens* L.	Boraginaceae	Forb
94	*Commelina benghalensis* L.	Commalinaceae	Forb
95	*Commicarpus verticillatus* (Poir.) Standl.	Nyctaginaceae	Forb
96	*Convolvulus auricomus* var. *auricomus* (A. Rich.) Bhandari	Convolvulaceae	Forb
97	*Convolvulus deserti* Hochst. & Steud.	Convolvulaceae	Forb
98	*Convolvulus Erectus* Cake	Convolvulaceae	Forb
99	*Convolvulus microphyllus* Sieb. ex Spreng.	Convolvulaceae	Forb
100	*convolvulus prostratus* Forsk.	Convolvulaceae	Forb
101	*Corchorus aestuans* L.	Tiliaceae	Forb
102	*Corchorus depressus* (L.) Vicary	Tiliaceae	Forb
103	*Corchorus tridens* L.	Tiliaceae	Forb
104	*Corchorus trilocularis* L.	Tiliaceae	Forb
105	*Cressa cretica* L.	Convolvulaceae	Forb
106	*Crotalaria burhia* Buch.-Ham. ex Benth.	Papilionaccae	Legume
107	*Crotalaria hirsuta* Willd.	Papilionaccae	Legume

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108	*Crotalaria medicaginea* Lam.	Papilionaccae	Legume
109	*Croton bonplandianum* Baill.	Euphorbiaceae	Forb
110	*Crypsis schoenoides* (L.) Lam.	Poaceae	Grass
111	*Cucumis prophetarum* L.	Cucurbitaceae	Climber
112	*Cymbopogon jawarancusa* (Jones) Schult.	Poaceae	Grass
113	*Cymbopogon martinii* (Roxb.) Watson.	Poaceae	Grass
114	*Cymbopogon parkeri* Stapf	Poaceae	Grass
115	*Cymbopogon schoenanthus* (L.) Spreng.	Poaceae	Grass
116	*Cynodon dactylon* (L.) Pers.	Poaceae	Grass
117	*Cyperus alopecuroides* Rottb.	Cyperaceae	Sedge
118	*Cyperus atkinsonii* Clarke.	Cyperaceae	Sedge
119	*Cyperus cuspidatus* HBK.	Cyperaceae	Sedge
120	*Cyperus iria* L.	Cyperaceae	Sedge
121	*Cyperus niveus* Retz.	Cyperaceae	Sedge
122	*Cyperus rotundus* L. ssp. *rotundus* (Rottb.) Kuk.	Cyperaceae	Sedge
123	*Cyperus tuberosus* Rottb.	Cyperaceae	Sedge
124	*Dactyloctenium aegyptium* (L.) Willd.	Poaceae	Grass
125	*Dactyloctenium aristatum* Link	Poaceae	Grass
126	*Dactyloctenium scindicum* Boiss.	Poaceae	Grass
127	*Desmostachya bipinnata* (L.) Stapf.	Poaceae	Grass
128	*Dichanthium annulatum* (Forsk.) Stapf.	Poaceae	Grass
129	*Dichanthium caricosum*(L.) A. Camus.	Poaceae	Grass
130	*Dichanthium foveolatum* (Del.) Roberty.	Poaceae	Grass
131	*Dichanthium pertusum* (L.) Calyton.	Poaceae	Grass
132	*Dicliptera paniculata* (Forssk.) I.Darbysh	Poaceae	Grass
133	*Dicliptera verticillata* (Forsk.) C.Christens.	Acanthaceae	Forb
134	*Dicoma tomentosa* Cass .	Asteraceae	Forb
135	*Digera muricata* (L.) Mart.	Amaranthaceae	Forb
136	*Digitaria bicornis* (Lam.) Roem. & Schult.	Poaceae	Grass
137	*Digitaria cilliaris* (Retz.) Koel.	Poaceae	Grass
138	*Digitaria pennata* (Hochst.) T.Cooke,	Poaceae	Grass
139	*Digitaria adscendens* (Kunth) Henrard	Poaceae	Grass
140	*Dinebra retroflexa* (Vahl.) Panzer.	Poaceae	Grass
141	*Dipcadi erythraeum* Webb. & Berth.	Liliaceae	Forb
142	*Diplachne fusca* (L.) P. Beauv.	Poaceae	Grass
143	*Dipteracanthus patulus* (Jacq.) Nees	Acanthaceae	Forb
144	*Dipteracanthus prostatus* (Poir.) Nees in Wall.	Acanthaceae	Forb
145	*Dipterygium glaucum* Decne.	Capparaceae	Shrub

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146	*Echinochloa colona* (L.) Link.	Poaceae	Grass
147	*Echinochloa crus-galli* (L.) P.Beauv.	Poaceae	Grass
148	*Echinops echinatus* Roxb.	Asteraceae	Forb
149	*Eclicpta alba* (L) Hassk.	Asteraceae	Forb
150	*Edyotis corymbosa* (L.) Lam.	Rubiaceae	Forb
151	*Eleocharis plantaginea* R. Br.	Cyperaceae	Sedge
152	*Eleusine coracana* (L.) Gaertn.	Poaceae	Grass
153	*Eleusine indica* (L.) Gaertn.	Poaceae	Grass
154	*Elytraria acaulis* (L.f.) Lindau in Engl.& Prantl.	Acanthaceae	Forb
155	*Enicostema axillare* (Lam.) Raynal in Adansonia.	Gentiaceae	Forb
156	*Enneapogon brachystachyus* (Jaub. & Spach.) Stapf.	Poaceae	Grass
157	*Enneapogon desvauxii* P.Beauv.	Poaceae	Grass
158	*Eragrostiella bifaria* (Vahl.) Bor.	Poaceae	Grass
159	*Eragrostiella brachyphylla* (Stapf.) Bor.	Poaceae	Grass
160	*Eragrostis amabilis* (L.) Hook. & Arnott	Poaceae	Grass
161	*Eragrostis aspera* (Jacq.) Nees.	Poaceae	Grass
162	*Eragrostis ciliaris* (L.) R.Br. var. *brachystachya* Boiss.	Poaceae	Grass
163	*Eragrostis ciliaris* (L.) R.Br. var. *ciliaris*	Poaceae	Grass
164	*Eragrostis gangetica* (Roxb.) Steud.	Poaceae	Grass
165	*Eragrostis japonica* (Thunb.) Trin.	Poaceae	Grass
166	*Eragrostis minor* Host.	Poaceae	Grass
167	*Eragrostis nigra* Nees ex Steud.	Poaceae	Grass
168	*Eragrostis tenella* (L.) P.Beauv.	Poaceae	Grass
169	*Eragrostis unioloides* (Retz.) Nees.	Poaceae	Grass
170	*Eremopogon foveolatus* (Delile) Stapf	Poaceae	Grass
171	*Euphorbia clarkeana* Hook.f.	Euphorbiaceae	Forb
172	*Euphorbia geniculata* Orteg.	Euphorbiaceae	Forb
173	*Euphorbia granulata* Forsk.	Euphorbiaceae	Forb
174	*Euphorbia heterophylla* L.	Euphorbiaceae	Forb
175	*Euphorbia heyneana* Spreng.	Euphorbiaceae	Forb
176	*Euphorbia hirta* L.	Euphorbiaceae	Forb
177	*Euphorbia indica* Lam.	Euphorbiaceae	Forb
178	*Euphorbia prostrata* Aiton	Euphorbiaceae	Forb
179	*Euphorbia thymifolia* L.	Euphorbiaceae	Forb
180	*Evolvulus alsinoides* (L.) L.	Convolvulaceae	Forb
181	*Fagonia indica* Burm.	Zygophyllaceae	Shrub

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182	*Fagonia schweinfurthii* (Hadidi) Hadidi. ex Ghafoor.	Zygophyllaceae	Shrub
183	*Fagonia burguieri* DC.	Zygophyllaceae	Shrub
184	*Fagonia cretica* L.	Zygophyllaceae	Shrub
185	*Farsetia hamiltonii* Royle.	Brassicaceae	Shrub
186	*Fimbristylis bisumbellata* (Forssk.) Bubani.	Cyperaceae	Sedge
187	*Gisekia pharnaceoides* L.	Molluginaceae	Forb
188	*Glinus lotoides* L.	Molluginaceae	Forb
189	*Glossocardia bosvallea* (L.f) DC.	Asteraceae	Forb
190	*Gnaphalium luteo-album* L.	Asteraceae	Forb
191	*Gomphrena celosioides* Mart.	Amaranthaceae	Forb
192	*Goniogyna hirta* (Willd) Ali	Papilionaceae	Legume
193	*Grangea maderaspatana* (L.) Poir.	Asteraceae	Shrub
194	*Hackelochloa granularis* (L.) O. Kuntze.	Poaceae	Grass
195	*Haloxylon salicornicum* (Moq.) Bunge.	Chenopodiaceae	Shrub
196	*Hedyotis puberula* (G. Don) Arn.	Rubiaceae	Forb
197	*Heliotropium bacciferum*Forsk.	Boraginaceae	Forb
198	*Heliotropium curassavicum* L.	Boraginaceae	Forb
199	*Heliotropium europaeum* L. var. *lasiocarpum* (Fish & Mey.) Kazmi	Boraginaceae	Forb
200	*Heliotropium indicum* L.	Boraginaceae	Forb
201	*Heliotropium marifolium* Retz.	Boraginaceae	Forb
202	*Heliotropium ovalifolium* Forsk.	Boraginaceae	Forb
203	*Heliotropium strigosum*Wild.	Boraginaceae	Forb
204	*Heliotropium subulatum* (Hochst. ex DC.) Vatke	Boraginaceae	Forb
205	*Heliotropium supinum* L.	Boraginaceae	Forb
206	*Heliotropium zeylanicum* (Burm.f.) Lam.	Boraginaceae	Forb
207	*Heliotropium strigosum* subsp. *brevifolium* (Wall.) Kazmi	Boraginaceae	Forb
208	*Hemarthria compressa* (L.f.)R.Br.	Poaceae	Grass
209	*Hemigraphis latebrosa* (Heyne ex Roth) Nees	Acanthaceae	Forb
210	*Heteropogon conortus* (L.) P. Beauv.	Poaceae	Grass
211	*Hibiscus ovalifolius* (Forssk.) Vahl	Malvaceae	Shrub
212	*Hibuscus micranthus* L.f	Malvaceae	Shrub
213	*Hoppea dichotoma* Heyne ex Willd.	Gentiaceae	Forb
214	*Hygrophyila serpyllum* (Nees) T. Anders	Acanthaceae	Forb
215	*Imperata cylindrica* (L.) Raeschel.	Poaceae	Grass
216	*Indigofera argentea* Burm.f.	Papilionaccae	Legume
217	*Indigofera cordifolia* Heyne ex Roth.	Papilionaccae	Legume

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218	*Indigofera hochstetteri* Baker.	Papilionaccae	Legume
219	*Indigofera linifolia* (L.f.) Retz.	Papilionaccae	Legume
220	*Indigofera linnaei* Ali.	Papilionaccae	Legume
221	*Indigofera oblongifolia* Forssk.	Papilionaccae	Legume
222	*Indigofera prostrata* Willd.	Papilionaccae	Legume
223	*Indigofera tinctoria* L.	Papilionaccae	Legume
224	*Indigofera trifoliata* L.	Papilionaccae	Legume
225	*Indigofera trita* L.f.	Papilionaccae	Legume
226	*Indoneesiella echioides* (L.) Sreemadh.	Acanthaceae	Forb
227	*Iseilema laxum* Hack.	Poaceae	Grass
228	*Iseilema prostratum* (L.) Anders.	Poaceae	Grass
229	*Iselima rugosum* Salisb.	Poaceae	Grass
230	*Justicia procumbens* L.	Acanthaceae	Forb
231	*Justicia quinqueangularis* Koenig ex Roxb.	Acanthaceae	Forb
232	*Justicia simplex* D.Don.	Acanthaceae	Forb
233	*Justicia trinervia* Vahl.	Acanthaceae	Forb
234	*Kickxia ramosissima* (Wall.) Janchen	Scrophulariaceae	Forb
235	*Lasiurus scindicus* Henr.	Poaceae	Grass
236	*Launaea resedifolia* (L) Kuntze.	Asteraceae	Forb
237	*Launaea procumbens* (Roxb.) Ramayya & Rajagopal.	Asteraceae	Forb
238	*Lepidagathis trinervis* Wal.ex Nees	Acanthaceae	Forb
239	*Leucas aspera* (Willd.) Link	Lamiaceae	Forb
240	*Leucas cephalotes* (Koen.ex Roth.) Spreng.	Lamiaceae	Forb
241	*Leucas urticifolia* (Vahl.) R.Br.	Lamiaceae	Forb
242	*Lindenbergia indica* (L.) Vatke	Scrophulariaceae	Forb
243	*Lindernia ciliata* (Colsm.) Pennell	Scrophulariaceae	Forb
244	*Ludwigia perennis* L.	Onagraceae	Forb
245	*Marsilea minuta* L.	Marsileaceae	Forb
246	*Marsilea quadrifolia* L.	Marsileaceae	Forb
247	*Martynia annua* L.	Martyniaceae	Forb
248	*Melanocenchris abyssinica* (R.Br. ex Fresen.) Hochst.	Poaceae	Grass
249	*Melanocenchris jacquemontii* Jaub. & Spach.	Poaceae	Grass
250	*Mollugo cerviana* (L.) Seringe.	Molluginaceae	Forb
251	*Mollugo nudicaulis* Lam.	Molluginaceae	Forb
252	*Murdannia nudiflora* (L.) Brenan	Commalinaceae	Forb
253	*Nothosaerva brachiata* (L.) Wight	Amaranthaceae	Forb
254	*Ochthochloa compressa* (Forsk.) Hill.	Poaceae	Grass

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255	*Ocimum americanum* L.	Lamiaceae	Shrub
256	*Ocimum gratissimum* L.	Lamiaceae	Shrub
257	*Oligochaeta ramosa* (Roxb) Wagenitz	Asteraceae	Forb
258	*Oplismenus burmannii* (Retz.) P.Beauv.	Poaceae	Grass
259	*Oplismenus compositus* (L.) P. Beauv.	Poaceae	Grass
260	*Oropetium thomaeum* (L.f.) Trin.	Poaceae	Grass
261	*Oxalis corniculata* L.	Oxalidaceae	Forb
262	*Panicum antidotale* Retz.	Poaceae	Grass
263	*Panicum miliaceum* L.	Poaceae	Grass
264	*Panicum paludosum* Roxb.	Poaceae	Grass
265	*Panicum repens* L.	Poaceae	Grass
266	*panicum turgidum* Forsk.	Poaceae	Grass
267	*Parthenium hysterophoru* L.	Asteraceae	Forb
268	*Paspalidium flavidum* (Retz.) A.Camus .	Poaceae	Grass
269	*Paspalum distichum* L.	Poaceae	Grass
270	*Paspalum paspaloides* (Michx) Scribner	Poaceae	Grass
271	*Pavonia zeylanica* (L.) Cav.	Malvaceae	Shrub
272	*Pedalium murex* L.	Pedaliaceae	Forb
273	*Pennisetum orientale* L.	Poaceae	Grass
274	*Pennisetum pedicellatum* Trin.	Poaceae	Grass
275	*Pennisetum purpureum* K.Schum.	Poaceae	Grass
276	*Peristrophe paniculata* (Forsk.) Brumitt	Acanthaceae	Forb
277	*Perotis hordeiformis* Nees in Hook .& Arn.	Poaceae	Grass
278	*Perotis indica* (L.) O. Ktze.	Poaceae	Grass
279	*Phragmites karka* (Retz.) Trin ex Steud.	Poaceae	Grass
280	*Phyla nodiflora* (L.) Greene.	Verbenaceae	Forb
281	*Phyllanthus amarus* Schum.& Thom.	Euphorbiaceae	Forb
282	*Phyllanthus maderaspatensis* L.	Euphorbiaceae	Forb
283	*Physalis angulata* L.	Solanaceae	Forb
284	*Polycarpea corymbosa* Lam.	Caryophyllaceae	Forb
285	*Polygala arvensis* Willd.	Polygalaceae	Forb
286	*Polygala elongata* Klein. ex Willol.	Polygalaceae	Forb
287	*Polygala erioptera* DC.	Polygalaceae	Forb
288	*Polygonum plebeium* R.Br.	Polygonaceae	Forb
289	*Portulaca oleracea* L.	Postulacaceae	Forb
290	*Portulaca meridiana* Linn. f.	Postulacaceae	Forb
291	*Pulicaria angustifolia* DC.	Asteraceae	Forb
292	*Pulicaria crispa* (Forssk.) Benth. & Hook.f.	Asteraceae	Forb
293	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Forb

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294	*Rostellularia quinquangularis* (Roxb.) Nees	Acanthaceae	Forb
295	*Rottboellia exaltata* L.	Poaceae	Grass
296	*Saccharum bengalense* Retz.	Poaceae	Grass
297	*Saccharum munja* Roxb.	Poaceae	Grass
298	*Saccharum spontaneum* L.	Poaceae	Grass
299	*Salvia aegyptica* L.	Lamiaceae	Forb
300	*Scirpus littoralis* Schard.	Cyperaceae	Sedge
301	*Sclerocarpus africanus* Jacq ex Murr	Asteraceae	Forb
302	*Sehima nervosum* (Rottl.) Stapf.	Poaceae	Grass
303	*Senna alexandrina* (Garsault) Thell.	Caesalpiniaceae	Forb
304	*Sesamum indicum* L.	Pedaliaceae	Forb
305	*Sesuvium portulacastrum* (L) L.	Aizoaceae	Forb
306	*Setaria glauca* (L.) P. Beauv.	Poaceae	Grass
307	*Setaria intermedia* Roem. & Schult.	Poaceae	Grass
308	*Setaria italica* (L.) P. Beauv.	Poaceae	Grass
309	*Setaria pumila* (Poir.) Roem. & Schult.	Poaceae	Grass
310	*Setaria tomentosa* (Roxb.) Kunth	Poaceae	Grass
311	*Setaria verticillata* (L.) P. Beauv.	Poaceae	Grass
312	*Sida cordata* (Burm.f) Borssum.	Malvaceae	Forb
313	*Sida cordifolia* Linn	Malvaceae	Shrub
314	*Sida ovata* Forssk.	Malvaceae	Shrub
315	*Sida rhombifolia* L.	Malvaceae	Forb
316	*Solanum incanum* L.	Solanaceae	Shrub
317	*Solanum surattense* Burm.f.	Solanaceae	Forb
318	*Solanum virginianum* L.	Solanaceae	Forb
319	*Sonchus asper* (L) Hill.	Asteraceae	Forb
320	*Sopubia delphinifolia* G. Don	Scrophulariaceae	Forb
321	*Sorghum halepense* (L.) Pers.	Poaceae	Grass
322	*Spermacoce articularis* L.f.	Asteraceae	Forb
323	*Sphaeranthus indicus* L.	Asteraceae	Forb
324	*Spodiopogon rhizophorus* (Steud.) Pilger.	Poaceae	Grass
325	*Sporobolus coromandelianus* (Retz.) Kunth.	Poaceae	Grass
326	*Sporobolus diander* (Retz.) P. Beauv.	Poaceae	Grass
327	*Sporobolus helvolus* (Trin.) Th.	Poaceae	Grass
328	*Sporobolus ioclados* (Nees ex Trin.) Nees	Poaceae	Grass
329	*Sporobolus marginatus* Hochst. ex A.Rich	Poaceae	Grass
330	*Sporobolus tenuissimus* (Schrank.) O. Kuntze	Poaceae	Grass
331	*Sporobolus virginicus* (L.) Kunth	Poaceae	Grass
332	*Striga angustifolia* (D.Don.) Saldhana	Scrophulariaceae	Forb

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333	*Striga gesnerioides* (Willd.) Vatke	Scrophulariaceae	Forb
334	*Suaeda fruticosa* (L.) Forssk.	Chenopodiaceae	Shrub
335	*Suaeda maritima* (L.) Dumort	Chenopodiaceae	Forb
336	*Suaeda monoica* Forssk. ex J.F	Chenopodiaceae	Forb
337	*Suaeda nudiflora* (Wild.) Moq.	Chenopodiaceae	Shrub
338	*Tephrosia falciformis* Ramaswammi	Papilionaccae	Legume
339	*Tephrosia pumila* (Lam) Pers.	Papilionaccae	Legume
340	*Tephrosia purpurea* (L.) Pers.	Papilionaccae	Legume
341	*Tephrosia strigosa* (Dalz.) Sant. & Mahesh.	Papilionaccae	Legume
342	*Tephrosia villosa* (L.) Pers.	Papilionaccae	Legume
343	*Tetrapogon tenellus* (Koen.ex Roxb.) Chiov.	Poaceae	Grass
344	*Tetrapogon villosus* Desf.	Poaceae	Grass
345	*Themeda quadrivalvis* (L.) O. Ktze.	Poaceae	Grass
346	*Tragus biflorus* Schult.	Poaceae	Grass
347	*Tragus roxburghii* Panigrahi in Kew Bull.	Poaceae	Grass
348	*Trianthema triquetra* Rottl.	Aizoaceae	Forb
349	*Trianthema decandra* L.	Aizoaceae	Forb
350	*Trianthema portulacastrum* L.	Aizoaceae	Forb
351	*Tribulus rajasthanensis* Bhandari & Sharma.	Zygophyllaceae	Forb
352	*Tribulus pentandrus* Forssk.	Zygophyllaceae	Forb
353	*Tribulus terrestris* L.	Zygophyllaceae	Forb
354	*Trichodesma amplexicaule* Roth.	Boraginaceae	Forb
355	*Trichodesma indicum* (L.) R. Br	Boraginaceae	Forb
356	*Tridax procumbens* L.	Asteraceae	Forb
357	*Trigonella occulta* Delile. ex DC.	Papilionaccae	Legume
358	*Tripogon jacquemontii* Stapf.	Poaceae	Grass
359	*Triumfetta pentandra* A.Rich.	Tiliaceae	Forb
360	*Triumfetta pilosa* Roth.	Tiliaceae	Shrub
361	*Triumfetta rhomboidea* Jacq.	Tiliaceae	Forb
362	*Typha angustata* Bory & Chaub.	Typhaceae	Forb
363	*Urginea indica* Kunth	Liliaceae	Forb
364	*Urochloa panicoides* P.Beauv.	Poaceae	Grass
365	*Verbesina encelioides* (Cav) Benth. & Hook. f. ex A. Gray.	Asteraceae	Forb
366	*Vernonia cinerea* (L) Less.	Asteraceae	Forb
367	*Vernonia anthelmintica* (L.) A Willd.	Asteraceae	Forb
368	*Vetivaria zizanioides* (L.) Nash	Poaceae	Grass
369	*Vigna trilobata* (L) Verdc.	Papilionaccae	Legume
370	*Waltheria indica* L.	Sterculiaceae	Shrub

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371	*Withania somnifera* (L.) Dunal.	Solanaceae	Shrub
372	*Xanthium indicum* J. Koenig.	Asteraceae	Forb
373	*Xanthium strumarium* L.	Asteraceae	Forb
374	*Zinnia elegans* Jacq.	Asteraceae	Forb
375	*Zornia gibbosa* Span	Papilionaccae	Forb

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