

Taxonomic assessment of Samtipura site in Jalore district of Rajasthan

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Abstract

Field survey for analysis of vegetation has been done. During this analysis total, 81 plants were observed along with 64 angiosperm genera of 28 families. Fabaceae is the largest family with 09 genera and 16 species. *Acacia* is the largest genera. The largest monocot family is Poaceae having 05 genera and 06 species. Herbs (66%) are followed by trees (22%). Majority of plants used as fodder (52%) followed by firewood (19%). Shrubs and climbers are equal in number.

Keywords: taxonomy, indigenous, invasive plants, vegetation and fodder

Introduction

The Jalore district is well known of Isabgol (*Plantago ovata* Forssk.) producer of India. Isabgol is a cash crop of this region. The study site is Samtipura, an area of Jalore district, situated in the Western part of Rajasthan state. Jalore coordinated between 25.22 N latitude and 72.58 E longitudes with an elevation of 160 meters from sea level. It lays South of Sukri River, a tributary of Luni River and foothills of Swarnagiri Mountain. There is a trend in the study area related to the origination of the name Jalore. The local people provide information that the name "Jalore" comes from the abundance of the plant Jaal (*Salvadora* ssp), meaning Jaal= *Salvadora* species + Lor = Hedges or the boundary of fields. Selected the site is important having natural habitats with least anthropogenic impacts on vegetation as well as a modern irrigation system. Because of these reasons taxonomic assessment of this site will be done.

Material and Methods

The investigation was done by intensive field survey, collection and data were collected by floras and literature. The preliminary observation of the vegetation of the site Samtipura was calculated from 2016 to September 2019 and final observation was made during the field survey from October 2019 to February 2020.

To the collection of the data for floristic diversity of site frequently visits were conducted in the morning hours.

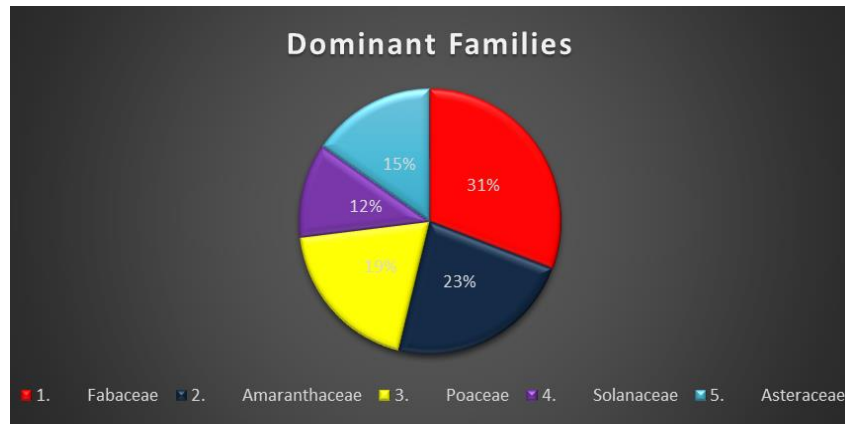
During fieldwork, important photographs of plants along with their habits, leaves, stem and floral parts were taken. Collected plant specimens were identified by using Flora of Rajasthan by Shetty and Singh, 1987; 1991 & 1993, Flora of the Indian Desert by Bhandari, 1995 and Flora of Rajasthan by Kotiya *et al.*, 2020^[1, 2, 3, 4, 5].

Result and Discussion

The present study contains a total of 81 plant species belonging to 28 families and 64 genera (Table-1). Most of the recorded plant species are dicots whereas some are monocots. The top 05 families are Fabaceae (08 genera & 16 species), Amaranthaceae (06 genera & 07 species), Poaceae (05 genera & 06 species), Asteraceae (04 genera & 04 species) and Solanaceae (03 genera & 05 species) (Table-1 & Graph-1). Hence Fabaceae, Amaranthaceae and Poaceae are largest families of the study site compare to the world where Fabaceae, Poaceae and Asteraceae are largest with having 745 genera & 19560 species, 707 genera & 11337 species and 1620 genera & 23600 species respectively (Stevens, 2012). The dominant dicot family is Fabaceae with 08 genera and 16 species whereas the largest monocot family is Poaceae with 05 genera and 06 species. The largest genera are *Acacia* consider 5 species such as *A. jacquemontii* Benth, *A. leucophloea* (Roxb.) Willd, *A. nilotica* (L.) Delile, *A. senegal* (L.) Willd. and *A. tortilis* (Forssk.) Hayne.

Table 1: Dominant families of the area

Sr. no	Family	Genera	Species
1.	Fabaceae	08	16
2.	Amaranthaceae	06	07
3.	Poaceae	05	06
4.	Solanaceae	03	05
5.	Asteraceae	04	04

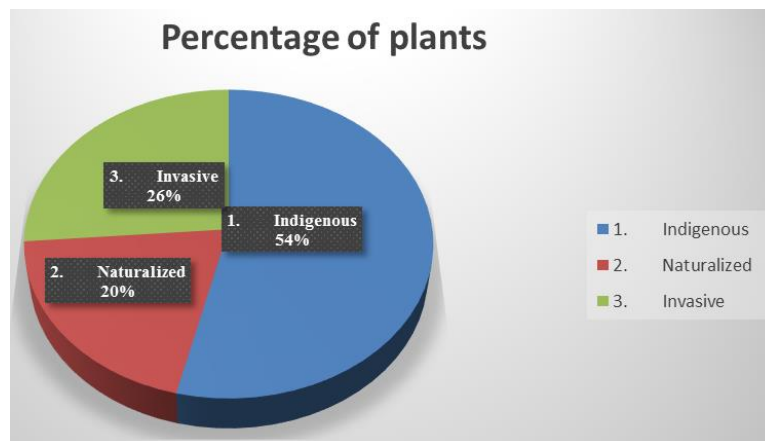


Graph 1: Showing percentage of dominant families of the area

Two newly recorded plants from Rajasthan i.e. *Solanum villosum* Mill. (Kumar *et al.*, 2020) [6] and *Solanum americanum* Mill. (Solanki *et al.*, 2020) [7] are recorded from the study site.

A total of 21 species of invasive plants Amaranthaceae has a maximum percentage (19%) of invasive plants (Table-3).

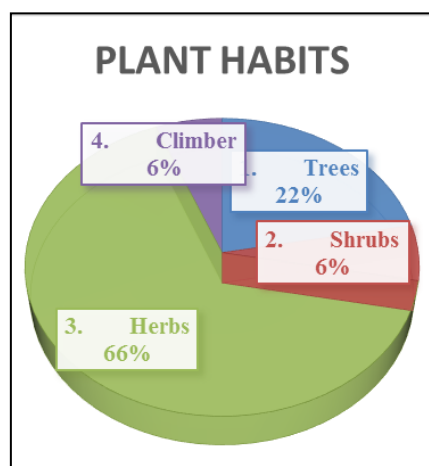
Indigenous and naturalized species represent 53% and 21% of the total species respectively. Out of total indigenous species, 21% species (highest) belongs to family Fabaceae, whereas 31% plant species of Fabaceae belongs to naturalized categories (Table-2 & Graph-2).



Graph 2

Table 2

Sr. no	Plant habit	Percentage	Origin status of plant	Percentage
1.	Trees	22%	Indigenous	54%
2.	Shrubs	06%	Naturalized	20%
3.	Herbs	66%	Invasive	26%
4.	Climber	06%		



Graph 3: Showing percentage of growth habits

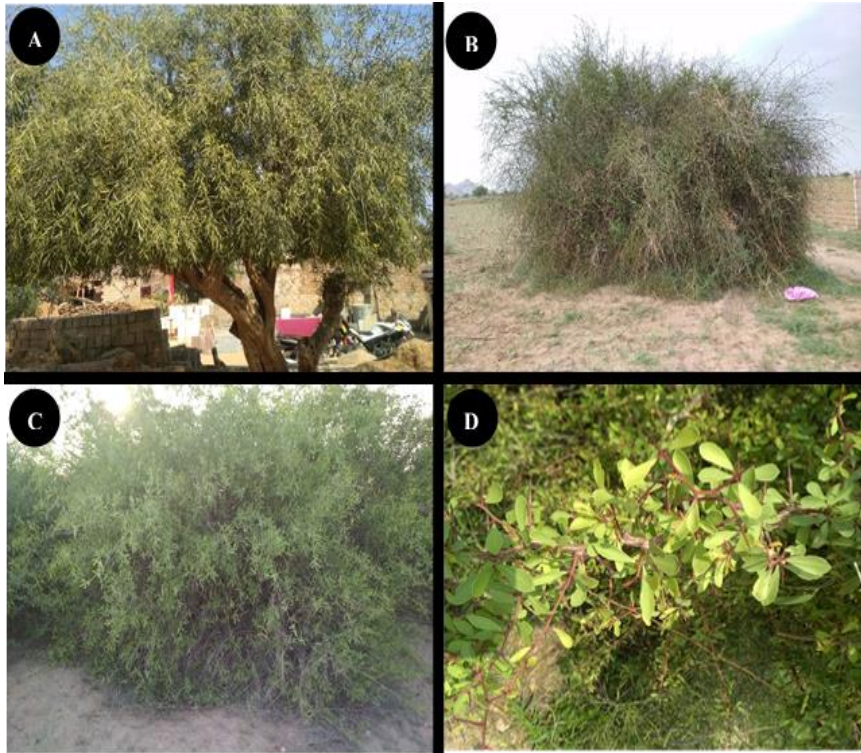


Fig 1: (A) *Salvadora oleoides* (B) *Capparis decidua* (C) *Salvadora oleoides* (as hedge) (D) *Maytenus emarginatus*

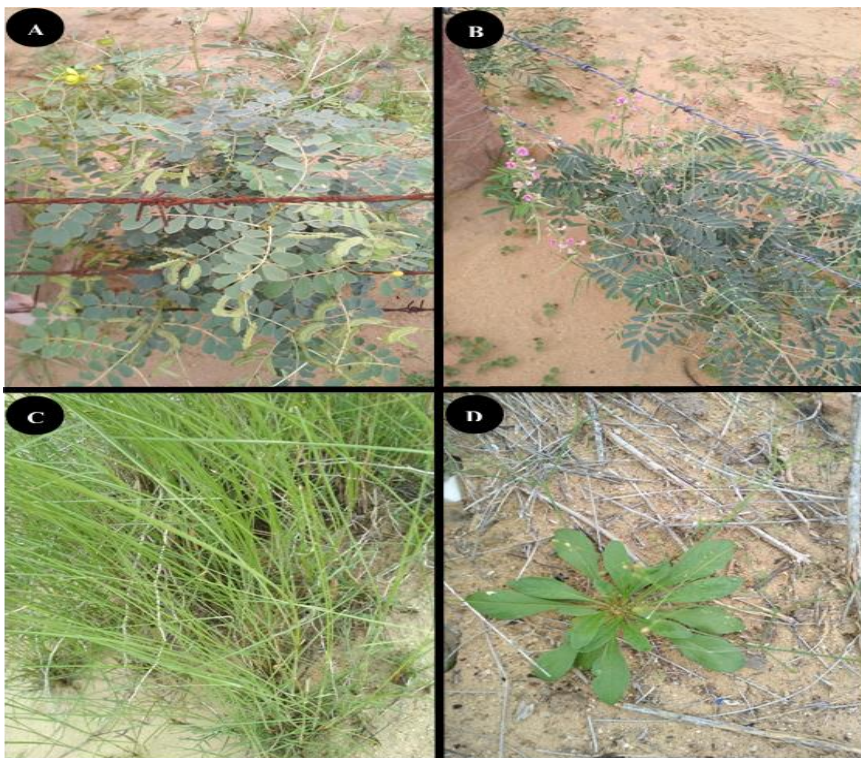


Fig 2: (A) *Cassia italica* (B) *Tephrosia falciformis* (C) *Desmostachya bipinnata* (D) *Mollugo naudiculis*

According to Whigham (2004),^[8] most plant biodiversity in an ecosystem is found in the herbaceous layer. The present study reveals similar observations and recorded the highest percentage (66%) of plants as a herbaceous habit. Among all 22% species show tree habit ahead of shrubs and climbers i.e. each of 6% species (Table-2 & Graph-3). The plants are being used as food, shelter, hedge, firewood and medicinally purpose from human civilization. Most of the studies plants (52%) recorded as useful for their fodder

values, 19% used as firewood and only 9% plant species used as a hedge (live fencing). According to the present observation population of *Balanites aegyptiaca* (L.) Del., *Leptadenia pyrotechnica* (Forsk.) Decne and *Fagonia indica* Burm, are decreasing in the past 10 years may be due to over exploitation and removal from fields. *Prosopis juliflora* (Swartz) DC, *Acacia tortilis* (Forssk.) Hayne. and *Salvadora* is dominant species of the study area.

There is no modern irrigation system hence weeds like *Parthenium hysterophorus* L., *Ageratum conyzoides* L., *A. houstonianum* Mill., *Lantana camara* L. and *Verbesina*

encelioides (Cav.) Benth & Hook. f. ex A. Gray are not common in the study site.

Table 3: Showing the list of the plant with a habit, indigenous/ exotic/ invasive status with uses.

Sr. no	Plant name	Family	Indigenous/ Exotic/ Invasive	Habit	Uses/ Used in
1	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Invasive	Herb	Firewood
2	<i>Acacia jacquemontii</i> Benth.	Fabaceae	Indigenous	Shrub	Firewood & Hedge
3	<i>Acacia leucophloea</i> (Roxb.) Willd.	Fabaceae	Indigenous	Tree	Firewood & Shelter
4	<i>Acacia nilotica</i> (L.) Delile	Fabaceae	Indigenous	Tree	Firewood & Hedge
5	<i>Acacia senegal</i> (L.) Willd.	Fabaceae	Indigenous	Tree	Vegetables & Firewood
6	<i>Acacia tortilis</i> (Forssk.) Hayne.	Fabaceae	Naturalized	Tree	Firewood & Hedge
7	<i>Achyranthus aspera</i> L.	Amaranthaceae	Invasive	Herb	Fodder
8	<i>Aerva javanica</i> (Burm.f.) Juss. Ex Schult.	Amaranthaceae	Naturalized	Herb	
9	<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	Indigenous	Tree	Firewood & Hedge
10	<i>Amaranthus hybrids</i> L.	Amaranthaceae	Naturalized	Herb	Fodder
11	<i>Amaranthus viridis</i> L.	Amaranthaceae	Invasive	Herb	Fodder
12	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Indigenous	Tree	Toothbrush & Skin disease
13	<i>Balanites aegyptiaca</i> (L.) Del.	Zygophyllaceae	Naturalized	Tree	Firewood & Soap
14	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Indigenous	Herb	Fodder
15	<i>Boerhavia erecta</i> L.	Nyctaginaceae	Indigenous	Herb	Fodder
16	<i>Calotropis procera</i> (Ait.) Ait.	Asclepiadaceae	Invasive	Shrub	Leaf used in for curing back pain
17	<i>Capparis decidua</i> (Forssk.) Edgew	Capparaceae	Indigenous	Tree	Firewood & Fruit used in pickle
18	<i>Cassia italica</i> (Mill.) Lam. Ex Andrews	Fabaceae	Invasive	Herb	
19	<i>Celosia argentea</i> L.	Amaranthaceae	Invasive	Herb	Fodder
20	<i>Cenchrus ciliaris</i> L.	Poaceae	Indigenous	Herb	Fodder
21	<i>Cenchrus setigerus</i> Vahl.	Poaceae	Indigenous	Herb	Fodder
22	<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Indigenous	Herb	Fodder
23	<i>Cleome viscosa</i> L.	Cleomaceae	Invasive	Herb	Fodder
24	<i>Coccinia grandis</i> (L.) J.O. Voigt	Cucurbitaceae	Naturalized	Climber	Vegetable
25	<i>Commelina benghalensis</i> L.	Commelinaceae	Naturalized	Herb	
26	<i>Convolvulus arvensis</i> L.	Convolvulaceae	Indigenous	Herb	Fodder
27	<i>Corchorus deprassus</i> (L.) Stocks	Tiliaceae	Invasive	Herb	Fodder
28	<i>Cordia gharaf</i> (Forsk.) Ehrenb. & Aschers.	Boraginaceae	Naturalized	Tree	Firewood & edible fruits
29	<i>Crotalaria burhia</i> Buch. Han.	Fabaceae	Naturalized	Herb	Fodder and Shelter
30	<i>Crotalaria medicaginea</i> Lam.	Fabaceae	Naturalized	Herb	Fodder
31	<i>Cucumis callosus</i> (Rottl.) Cogn.	Cucurbitaceae	Indigenous	Climber	Fodder
32	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Invasive	Herb	Fodder
33	<i>Cyperus iria</i> L.	Cyperaceae	Indigenous	Herb	Fodder
34	<i>Desmostachya bipinnata</i> (L.) Stapf	Poaceae	Indigenous	Herb	Fodder
35	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Poaceae	Naturalized	Herb	Fodder
36	<i>Datura metel</i> L.	Solanaceae	Invasive	Herb	Skin disease
37	<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Invasive	Herb	Fodder
38	<i>Digitaria ciliaris</i> (Retz.) Koel.	Poaceae	Indigenous	Herb	Fodder
39	<i>Echinops echinatus</i> Roxb.	Asteraceae	Invasive	Herb	Fodder
40	<i>Erigeron canadensis</i> L.	Asteraceae	Naturalized	Herb	Fodder
41	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Indigenous	Herb	
42	<i>Euphorbia thymifolia</i> L.	Euphorbiaceae	Invasive	Herb	
43	<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Invasive	Herb	Fodder
44	<i>Fagonia indica</i> Burm.	Zygophyllaceae	Indigenous	Herb	Leather clearing
45	<i>Fagonia schweinfurthii</i> (Hadidi) Hadidi	Zygophyllaceae	Indigenous	Herb	Leather clearing
46	<i>Ficus benghalensis</i> L.	Moraceae	Indigenous	Tree	Firewood
47	<i>Ficus religiosa</i> L.	Moraceae	Indigenous	Tree	Firewood
48	<i>Gisekia pharnecoides</i> L.	Molluginaceae	Indigenous	Herb	Fodder
49	<i>Heliotropium marifolium</i> Retz.	Boraginaceae	Naturalized	Herb	Fodder
50	<i>Leptadenia pyrotechnica</i> (Forsk.) Decne.	Asclepiadaceae	Indigenous		Broom and fodder
51	<i>Lycium barbarum</i> L.	Solanaceae	Naturalized	Shrub	Hedge
52	<i>Malvestrum coromandelianum</i> (L.) Garcke	Malvaceae	Invasive	Herb	Fodder
53	<i>Mearua arenaria</i> (DC.) Hook. f. and Thoms.	Capparaceae	Indigenous	Climber	Fodder
54	<i>Mimosa hamate</i> Willd.	Fabaceae	Indigenous	Tree	Firewood & Hedge
55	<i>Mollugo naudiculis</i> Lam.	Molluginaceae	Indigenous	Herb	Fodder
56	<i>Ocimum basilicum</i> L.	Lamiaceae	Indigenous	Herb	Mosquito repellent
57	<i>Parkinsonia aculeata</i> L.	Fabaceae	Naturalized	Shrub	Fodder
58	<i>Pergularia deamea</i> (Forsk.) Chiov.	Asclepiadaceae	Indigenous	Climber	Fodder
59	<i>Phyllanthus fraternus</i> G.L. Webster	Euphorbiaceae	Indigenous	Herb	
60	<i>Portulaca oleracea</i> L.	Portulacaceae	Invasive	Herb	Fodder

61	<i>Prosopis cineraria</i> (L.) Druce	Fabaceae	Indigenous	Tree	Fodder & vegetables
62	<i>Prosopis juliflora</i> (Swartz) DC.	Fabaceae	Invasive	Tree	Firewood & hedge
63	<i>Pulicaria crispa</i> Sch. Bip.	Asteraceae	Indigenous	Herb	
64	<i>Pupalia lappacea</i> (L.) Juss	Amaranthaceae	Indigenous	Herb	Fodder
65	<i>Rhynchosia minima</i> (L.) DC.	Fabaceae	Indigenous	Herb	Fodder
66	<i>Rivea hypocrateriformis</i> Choisy	Convolvulaceae	Indigenous	Climber	
67	<i>Salvadora oleoides</i> Decne.	Salvadoraceae	Indigenous	Tree	Firewood & Fodder
68	<i>Salvadora persica</i> L.	Salvadoraceae	Indigenous	Tree	Firewood
69	<i>Solanum americanum</i> Mill.	Solanaceae	Invasive	Herb	
70	<i>Solanum villosum</i> Mill.	Solanaceae	Indigenous	Herb	
71	<i>Solanum virginianum</i> L.	Solanaceae	Indigenous	Herb	
72	<i>Tamarindus indica</i> L.	Fabaceae	Naturalized	Tree	Food
73	<i>Tecomella undulata</i> (Sm.) Seem.	Bignoniaceae	Indigenous	Tree	Timber
74	<i>Tephrosia falciformis</i> S.V. Ramaswamy	Fabaceae	Indigenous	Herb	Fodder
75	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae	Indigenous	Herb	Fodder
76	<i>Trianthema portulacastrum</i> var. <i>Flava</i> L.	Aizoaceae	Invasive	Herb	Fodder
77	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Invasive	Herb	Fodder
78	<i>Trichodesma zeylanicum</i> (Burm. f.) R.Br.	Boraginaceae	Invasive	Herb	Fodder
79	<i>Tridax procumbens</i> (L.) L.	Asteraceae	Naturalized	Herb	
80	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Naturalized	Tree	Fodder & Hedge
81	<i>Ziziphus nummularia</i> (Burm. f.) Wight and Arn.	Rhamnaceae	Indigenous	Shrub	Fodder & hedge

Conclusion

The study concludes a total of 28 families are founded with 64 genera and 81 species. There are 26 dicot families and 2 monocot families. The largest angiosperm family were Fabaceae. The Poaceae were largest monocot family with 6 species. We got 10 monotypic families. Among plants, we observe 66% herbs, 6% shrubs, 6% climbers and 22% tree species.

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