

# Asian Resonance

## Check List of the Vascular Plants of Deedwana Tehsil, District Nagaur, Rajasthan, India

### Abstract

The floristic survey of Deedwana tehsil resulted in collection of 331 species belonging to 218 genera and 65 families. A check list is presented along with a brief account on topography, climate, vegetation and floristic analysis. The halophytic association of *Suaeda fruticosa*-*Cressa cretica*-*Heliotropium curassavicum* series is unique feature in the area which has been recorded during extensive survey of the region. It is the characteristic of the salty wetland. Emphasis has been given on the vegetation distribution pattern in arid and semi-arid region along with area occupied by salt lake.

**Keywords:** Vascular Plants Check List, Deedwana, Nagaur, Rajasthan.

### Introduction

India occupies a special status in terms of ecosystem, species and genetic diversity because of its location in the tropical zone, physical features and eco-climatic conditions. Rajasthan is the largest state of India and is situated in the north-western part of India between 23°3'N and 30°12'N latitude and 69°30'E and 78°17'E longitude, occupying an area of 3,42,239 sq.km. The elevation of land surface varies from 214 to 1375 m. In shape, it is an irregular rhomb with north-south and east-west diagonals, the former about 784 km. and the latter 850 km. long. The remarkable feature of Rajasthan is the Aravalli range, perhaps the oldest folded mountain range in the world. It intersects Rajasthan from end to end, diagonally running from Delhi to the plains of Gujarat for a distance of about 692 km. It has a wide range of habitats, climatic factors, physiography, soil types and geological antiquity. Aravalli range divides the whole of Rajasthan into two natural divisions i.e. three fifth lying on north-west and two fifth on the east and south-east.

Like other contiguous districts of the State, Nagaur, in terms of climate, is conspicuous for extreme dryness, large variations of temperature and highly variable rainfall. While the period from April to June is the summer month, November to March constitutes the winter season. The period from July to September comprises the rainy season. The relative humidity is generally low. Barring moderate to strong winds during May- August, winds are generally light to moderate. From November to February, the winds blow is mainly from directions between north-west and north westerly to south-westerly winds begin in March and these become more common with the advance of directions between west and south. During October, winds are light and variable in direction. The normal annual rainfall in the district is 38.86 cm. Temperature keep on rising intensely from March till May and June which are known as the mean hottest month. The maximum temperature in Nagaur district goes up to 47.0 C and the minimum 00 C. The mean temperature remained at 23.50 C. With the onset of south-west monsoon by July, there is a significant fall in the day temperature. However, after the monsoon is over by the first week of September, the day temperature shows a steady rise while the night temperature continues to fall, till January which is considered as the coldest month. Deedwana is situated at a distance of 92 kilometers east of district head quarter, Nagaur and 165 kilometers to the north-west to the Jaipur. Deedwana is famous for salt lake which is locally known as "KHARDA". The study area lying in the northeastern part of the district covers about 1637.59 sq. kms area.



**Jehangeer Rehman  
Quereishi**

Associate Professor,  
Deptt. of Botany  
Government Bangur College,  
Deedwana, Nagaur,  
Rajasthan, India

Nagaur district is located in the centre of the Rajasthan state between 26°23' and 27°42' north latitudes and 73°40' and 75°15' east longitudes. This district covers an area of 17,718 sq. km. which is about 5.177% of total area of the state. The present study is a report based on survey of angiospermic plants of Deedwana tehsil of Nagaur district (Fig.1). A total of **three hundred thirty one** species, grouped into **two hundred eighteen** genera, assigned to **sixty five** families according to Bentham and Hooker's system of classification have been recorded from Deedwana tehsil.

#### Objective of the Study

An enumeration of all the species of angiospermic plants occurring in an area gives manifold informations such as floristic contents of the region, vegetation types, vegetation association types, environmental factors and its effect on vegetation, idea about biological spectrum of an area etc. Phytodiversity study leads to updated knowledge of the vegetation of the study area. The present work on the flora of Deedwana tehsil has been taken up by the author for investigation along these lines and to enumerate all the vascular plants species occurring in the area. It also include the study of the vegetation types specially the halophytic species growing in the region and comparison of the floral contents available in the study area with that of adjoining areas for evaluating the biological spectrum of the region. In this respect Delhi, upper Gangatic plains, Western Rajasthan has been taken up in the present study. Ecological studies including habitat-wise classification and distribution patterns of plant communities, effect of biotic and climatic stress conditions on this flora have been discussed. This work will also be helpful in compilation of the flora of Nagaur district.

#### Review of Literature

In recent years a large number of publications dealing with the flora and floral composition of Rajasthan have been published. These have been reviewed by Jain (1970) Bhandari (1978), Sharma (1980). Publication of Flora of Indian Desert (Bhandari, 1990), Flora of north-east Rajasthan (Sharma & Tiagi, 1979) and Flora of Rajasthan (Shetty & Singh, 1987) have further added to our knowledge of the flora and floral composition of Rajasthan. District flora of Tonk (Shetty & Pandey, 1983) and Banswara (Singh, 1983) of Rajasthan have been published. Quereishi (2002, 2017, 2018) and Sharma & Aggarwal (2008), have significantly contributed towards our knowledge about the vegetation of Deedwana and Nagaur. Intensive botanical exploration of Nagaur district of Rajasthan is in progress including study of phytodiversity of Deedwana tehsil.

#### Research Methodology

The surveys for plant collection were conducted at regular interval throughout the year. Excursions were undertaken minimum two times a month. Field trips were arranged in such a way to cover all the locations at more or less regular intervals to collect most of the plants in flowering and fruiting stages. All the specimens collected were serially

numbered for ready reference. The field notes included habit, habitat, colour of flowers, associations etc. The present study is also an attempt to work out the phytodiversity of this region. Herbarium methodology given by Jain & Rao (1976) was followed. Provisional identification was made by the help of Duthie's FUGP (Vol 1-2 repr. 1952), Santapau's Fl. Saur. (Vol 1952), Hooker's flora (Vol 1-7 repr. 1952) and Flora of North-Eastern Rajasthan (Sharma & Tiagi, 1979; Bhandari, 1990, and Shetty & Singh 1987). Further help was taken from many other monographs and revisions. These identification were later on confirmed by matching the plants with authentic specimens at the RUBL Jaipur and JAC Jodhpur.

#### Regional Physiography

Nagaur district shares its border with several other districts of the state. On the North, it is bounded by Bikaner and Churu districts, on the east by Sikar and Jaipur districts, on the south by Ajmer and Pali districts and on the west by Jodhpur district. The district is irregular in shape and resembles a deformed parallelogram. Two strangulated triangles with their vertices protruding in the neighboring districts are on its eastern and western sides. The topography generally is fairly even. A part of the district falls in the category of "Desert" as the north-western region is covered with large sand dunes, extending sometimes in a continuous series. The district has its general slopes towards the west. Its elevation is about 300 meters; ranging between 250 meters in south and 640 meters in the north. The district is conspicuous in the absence of high hills. Dots of hillocks, particularly in the south-eastern sector, are sporadically scattered. At Jayal and Khatu, the hillocks are utilized for stone extraction. There is no vegetation anywhere on these hillocks. Tikli hills are situated near Raisinghpura village in Deedwana Tehsil. Koliya and Patan hills coming within the jurisdiction of Deedwana tehsil are not very high. In Merta, Nawa and Parbatsar Tehsils, off-shoots of Aravalli range are projected specially along the common border with Ajmer district. Hills near Kuchaman and Nawa attain some height. Masonary stones especially "Pattis" used as beams in the building are extracted from these hills. A segment of the Great Indian Desert covers the north, north-west and north-east parts of the district. No river has its source in the district. Seasonal streams and nallahs do not have a sizeable number and their flow depends on the frequency of rainfall. Harsor stream which has its source from the Aravalli off-shoots flows north-west for a run of about 48 kilometers. Subsequently, it meets other streamlets past Harsor village where after both the streams combined together lose their identity by discharging into the Pundlotasar. Some river lets and nallahs rise during monsoons and disappear after a short run into sandy plains near Khatu, Barnal, Jayal and Jani villages. A big salt lake exists about 4 kms to the south-west of Deedwana.

#### Vegetation

Most of the study area under investigation lies in the arid and semi-arid climate. Consequently, it

is characterized by sandy, salty and gravelly plain, more or less barren of vegetation except in the rainy season when multitudes of ephemerals come up and transform the bare land into a green carpet. These ephemerals complete their life-cycle before the advent of summer heat and the bulk of the area is again transformed into open sandy, salty and gravelly plain. (Bhandari, 1990). In general the vegetation in the semi-arid region is sparse. Plants with only xerophytic adaptations are able to establish themselves. The bulk of vegetation consists of stunted, thorny or prickly shrubs and perennial herbs capable of drought resistance. Distinctly scattered trees of stunted growth are found along depressions. Such type of vegetation is known as **desert scrub**. In the semi-arid region the vegetation mainly consists of dwarf grasses interspersed with few characteristic desert shrubs. Permanent vegetation of the entire area is, therefore, xerophytic in characters. Though the floral composition of the vegetation of western Rajasthan is fairly well-known through the exhaustive work of Blatter and Hallberg (1918-21), yet adequate details on ecology are lacking. Blatter and Hallberg (1918-21) call the main types of plant communities as formations which are exclusively controlled by edaphic factors; they divided these formations into smaller units known as associations and families. Almost all the subsequent workers have followed these authors in describing the vegetation of this region. Since the climate is more or less homogeneous, the vegetation can better be said to be edaphically controlled. Depending upon the rain water, the vegetation can also be distinctly divided into ephemerals and perennials. The vegetation of Deedwana Tehsil represents the characteristic natural flora of the State, which is a thorny, secondary forest, or an arid, open, scrub forest (Quereishi, 2002, 2017, 2018).

The permanent vegetation is xerophytic in character and shows various xeromorphic features such as a thick tomentum, succulence, stunted growth, coating of wax, thick cuticle protected stomata, etc. The plants occur in open, clump formations with plenty of vacant spaces between trees and shrubs. Most of the woody species regenerate vegetatively and some propagate even by natural layering. Unless the stumps and roots are grubbed out, the thorny forest tends to maintain itself by producing root suckers and coppicing shoots. These features appear common in dry situations. The noteworthy examples are: *Prosopis cineraria*, *Acacia nilotica*, *Balanites roxburghii*, *Grewia tenax*, *Capparis decidua*, *Zizyphus nummularia* and *Anogeissus pendula*. The trees comprising perennial vegetation of Deedwana Tehsil are both indigenous and introduced (Quereishi, 2002). The former are represented chiefly by *Prosopis cineraria*, *Acacia leucophloea*, *A. senegal*, *A. nilotica*, *Salvadora persica*, *S. oleoides*, *Wrightia tinctoria*, *Cordia mixa*, *Tecomella undulata*, *Zizyphus mauritiana* and *Balanites aegyptiaca*. Among the latter, the noteworthy example is *Prosopis chilensis*, an evergreen, spiny, small tree, native of the arid regions of Mexico and Central America. It was first introduced in India in 1877. It is very common on

the entire area and has become a part and parcel of the native flora. Other successfully introduced trees are: *Azadirachta indica*, *Dalbergia sissoo*, *Parkinsonia aculeata*, *Albizia lebbek*, and *Acacia tortalis* (Quereishi, 2002). The thorny shrubs occur in widely spaced clumps supporting a number of twinners and climbers. Of these *Capparis decidua* is very common and abundant, growing along or associated with *Grewia tenax*, *Maytenus emarginatus* and *Clerodendrum phlomidis*. Other shrubs occur in localized, isolated patches include *Mimosa hamata*. There are no epiphytes in a thorny, scrub forest because of adverse climate but few lianas like *Maerua arenaria* and *Cryptostegia grandiflora* are known to occur on the common trees. Other undershrubs which come into vigour and growth after rains are: *Indigofera tinctoria*, *I. astragalina*, *Tephrosia purpuria*, *T. villosa* and *Ocimum americanum*. The Peer pahari hill is dominated by *Euphorbia caducifolia* and *Grewia tenax*, and Tikli dungari is dominated by *Acacia tortalis* and *Maytenus emarginatus*, although other trees and shrubs like *Acacia leucophloea*, *Prosopis cineraria*, *Grewia tenax*, *Balanites aegyptiaca* are common and Koliya dungari is dominated by *Wrightia tinctoria* (Quereishi, 2002).

Monsoon season induces marked changes; when all the three hillocks wear a new cloak of green and the whole ground becomes carpeted with a variety of herbs which cover the surface with a vivid green. These plants complete their life history in three to four months after the rains. They help in increasing the humus content of the soil and extending the vegetation to barren areas. The commonest and most successful annuals belong to the families Amaranthaceae, Tiliaceae, Capparidaceae, Papilionaceae, Asteraceae, Convolvulaceae, Pedaliaceae, Cleomaceae, Boraginaceae, Aizoaceae, Molluginaceae, Acanthaceae, Commelinaceae, Cyperaceae, and Poaceae (Quereishi, 2002, 2017). Among them the most common annuals are *Corchorus aestuans*, *Tribulus rajasthanensis*, *T. terrestris*, *Cleome viscosa*, *Trianthema portulacastrum*, *Vernonia cineria*, *Bidens biternata*, *Heliotropium curassavicum*, *H. ovalifolium*, *H. subulatum*, *Trichodesma amplexicaule*, *Sesamum indicum*, *Peristrophe bicaliculata*, *Justicia simplex*, *Boerhavia diffusa*, *Achyranthes aspera*, *Pupalia lappacea*, *Euphorbia hirta*, *Phyllanthus fratenus*, *Commelina benghalensis*, *Cyperus rotundus*, *C. triceps*, *C. irio*, *Heteropogon contortus*, *Cenchrus setigerus*, *C. ciliaris*, *Eragrostis cilianensis*, *Digitaria pennata*, *Eleusine compressa*, *Brachiaria ramosa*, *Dactyloctenium aegyptium* and *Aristida adscensionis*. Besides, a number of annual and perennial twinners and climbers belonging to the Convolvulaceae, Asclepiadaceae, Cucurbitaceae and Papilionaceae add to the rainy season aspects of the vegetation. Among the common ones are: *Ipomoea obscura*, *I. pes-tigridis*, *I. sindica*, *Rivea hypocrateformis*, *Coccinia cordifolia*, *Melothria maderaspatana*, *Rhynchosia minima*, *Cryptostegia grandiflora* (Quereishi, 2002, 2017). In areas where the soil consists of gravel or a thin, superficial mantle of soil

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over the rock, *Indigofera linneaii* forms a dense tufted growth and form a pioneer plant community on the parent rock. Amongst introduced weeds, *Heliotropium curassavicum*, *Glinus lotoides*, and *Xanthium strumarium*, *Launaea resedifolia*, *Eclipta indica* thrive commonly in depressed areas or more often along roadsides and paths. There are also met some perennial weeds which occurs almost all round the year, e.g. *Calotropis procera*, *Withania somnifera*, *Abutilon indicum* and others (Quereishi, 2002, 2017).

#### Result and Discussion

The present work enumerates 331 vascular plant species belonging to 218 genera under 65 families (Table-1) occurring in Deedwana tehsil of Nagaur district. It is clear from table 2 that the ratio of total number of genera to species is 1: 1.51, which is rather low in comparison to a corresponding ratio for whole of India (1:7), but it is more or less in conformity with this ratio for the Gangatic plain region (1:2.2) and that of Delhi region (1: 1.63) as reported by Maheshwari 1963 and it is more or less comparable to the flora of Rajasthan 1: 2.4 (Shetty and Singh, 1993). it is also interesting to note from table 2 that the percentage occurrence of the genera (84.86%) and species (85.80%) of dicotyledons is more or less identical. This is also evident in the monocotyledons genera and species (15.13% and 14.19%). A perusal of table 3 reveals that family Fabaceae (33 species) occupies the top position in the flora of Deedwana tehsil. Family Poaceae (29 species) occupies the second, Asteraceae (26 species) occupies the third position in the flora of Deedwana tehsil.

**Table-1: Check List of Vascular Plants of Deedwana Tehsil**

1. MENISPERMACEAE  
*Cocculus hirsutus* (L.) Diels.  
*Cocculus pendulus* (J.R. & G. Forst.) Diels  
*Tinospora cordifolia* (Willd.)
2. PAPAVERACEAE  
*Argemone mexicana* Burm.f.
3. FUMARIACEAE  
*Fumaria indica* (Haussk.) Pugsley.
4. BRASSICACEAE  
*Farsetia hamiltonii* Royle.  
*Lepidium sativum* L.
5. CLEOMACEAE  
*Cleome gynandra* L. var. *gynandra*  
*Cleome gynandra* L. var. *nana* (Blatt. & Hall.)  
*Cleome viscosa* L.
6. CAPPARACEAE  
*Capparis decidua* (Forssk.) Edgew.  
*Crateva adansonii*  
*Maerua oblongifolia* (Forsk.) A. Rich  
*Maerua arenaria* (DC.) Hook.f. & Thoms.
7. POLYGALACEAE  
*Polygala erioptera* DC.  
*Polygala irregularis* Boiss.
8. CARYOPHYLLACEAE  
*Spergula fallax* (Lowe) Krause.  
*Stellaria media* (L.) Vill.
9. PORTULACACEAE  
*Portulaca meridiana* Linn. f.  
*Portulaca oleracea* L.
- Portulaca quadrifida* L.
10. TAMARICACEAE  
*Tamarix aphylla* (L.) Karst.  
*Tamarix dioica* Roxb. ex Roth
11. ELATINACEAE  
*Bergia ammannioides* Heyne ex. Roth.  
*Bergia suffruticosa* (Del.) Fenzl.
12. MALVACEAE  
*Abutilon indicum* (L.) Sweet  
*Abutilon ramosum* (Cav.) Guill & Perr.  
*Hibiscus ovalifolius* (Forssk.) Vahl.  
*Malva parviflora* L.  
*Malvastrum coromandelianum* (L.) Garcke  
*Pavonia arabica* Hochst ex. Steud.  
*Pavonia arabica* var. *glutinosa* Blatt. & Hallb.  
*Pavonia zeylanica* (L.) Cav.  
*Sida cordifolia* L.  
*Sida ovata* Forssk.
13. TILIACEAE  
*Corchorus aestuans* L.  
*Corchorus depressus* (L.) Stocks  
*Corchorus tridens* L.  
*Corchorus trilocularis* L.  
*Grewia tenax* (Forssk.) Fiori.  
*Grewia villosa* Willd.
14. ZYGOPHYLLACEAE  
*Fagonia indica* Burm. f.  
*Fagonia schweinfurthii* (Hadidi) Hadidi  
*Seetzenia lanata* (Willd.) Bullock  
*Tribulus rajasthanensis* Bhandari et Sharma  
*Tribulus terrestris* L.  
*Zygophyllum simplex* L.
15. OXALIDACEAE  
*Oxalis corniculata* L.
16. SIMAROUBACEAE  
*Ailanthus excelsa* Roxb.
17. BALANITACEAE  
*Balanites aegyptiaca* (L.) Coleb.
18. BURSERACEAE  
*Commiphora wightii* (Arnott) Bhandari
19. MELIACEAE  
*Azadirachta indica* A. Juss.  
*Melia azadirachta*
20. CELASTRACEAE  
*Maytenus emarginatus* (Willd.) Ding Hou
21. RHAMNACEAE  
*Zizyphus mauritiana* Lam.  
*Zizyphus nummularia* (Burm. f.) Wight & Arn
22. MORINGACEAE  
*Moringa oleifera* Lamk.
23. FABACEAE (PAPILIONACEAE nom. alt.)  
*Alhagi maurorum* Medik.  
*Alysicarpus longifolius* (Rottb. Ex. Spreng.) Wt & Arn.  
*Alysicarpus monilifer* (L.) DC.  
*Crotalaria burhia* Buch.-Ham. ex Benth.  
*Crotalaria medicaginea* Lam.  
*Crotalaria medicaginea* Lamk. var. *luxurians* (Benth.) Baker  
*Cyamopsis tetragonoloba* (L.) Taub.  
*Dalbergia sissoo* Roxb.  
*Derris indica* (Lamk.) Bennet  
*Goniogyna hirta* (Willd.) Ali

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*Indigofera astragalina* DC.  
*Indigofera cordifolia* Heyne ex Roth.  
*Indigofera hochstetteri* Baker  
*Indigofera linifolia* (Linn.f.) Retz.  
*Indigofera linnaei* Ali  
*Indigofera sessiliflora* DC.  
*Indigofera tinctoria* L.  
*Medicago laciniata* (L.) Mill.  
*Medicago sativa* L.  
*Melilotus alba* Medik ex Desr.  
*Melilotus indica* (L.) All.  
*Psoralea plicata* Delile  
*Rhynchosia minima* var. *laxiflora* (L.) DC.  
*Rhynchosia pulverulenta* Stocks  
*Rhynchosia schimperii* (Hochst.) Boiss.  
*Tephrosia leptostachya* DC.  
*Tephrosia purpurea* (L.) Pers.  
*Tephrosia wallichii* Graham  
*Trigonella foenum-graecum* L.  
*Trigonella hamosa* L. subsp. *uncata* (Boiss. & Noe)  
*Vigna aconitifolia* (Jacq.) Marechal  
*Vigna radiata* (L.) Wilczek.  
*Zornia gibbosa* Span.

24. CAESALPINIACEAE  
*Cassia obtusifolia* L.  
*Delonix regia* (L.) Gamble.  
*Parkinsonia aculeata* L.

25. MIMOSACEAE  
*Acacia jacquemontii* Benth  
*Acacia leucophloea* (Roxb.) Willd.  
*Acacia nilotica* (L.) Willd. Ex sub sp.  
*cupressiformis* (J.L. Stewart) Ali & Faruki  
*Acacia nilotica* (L.) Willd. ex sub sp. *indica* (Benth.) Brenan  
*Acacia senegal* (L.) Willd.  
*Acacia tortalis* (Forsk.) Hayne  
*Albizia lebbekii* (L.) Benth.  
*Mimosa hamata* Willd.  
*Leucaena latisiliqua* (L.) Gillis.  
*Pithecellobium dulce* (Roxb.) Benth.  
*Prosopis chialensis* (Molina) Stunz  
*Prosopis cineraria* (L.) Druce

26. COMBRETACEAE  
*Anogeissus sericea* Brandis var. *nummularia* King ex Duthie

27. LYTHRACEAE  
*Ammannia baccifera* L.

28. CUCURBITACEAE  
*Benincasa hispida* syn *B. cerifera*  
*Blastania cerasiformis* (Stocks) Hook.f.  
*Citrullus colocynthis* (L.) Schard  
*Citrullus fistulosus* Stocks  
*Citrullus lanatus* (Thunb.) Matsumara & Nakai  
*Coccinia grandis* (L.) J.O. Voigt  
*Corallocarpus conocarpus* (Dalz. & Gibs.) Hook. f.  
*Corallocarpus epigaeus* (Rottl. & Willd.) Hook. f./Clarke  
*Cucumis callosus* (Rottl.) Cogn.  
*Cucumis melo* Linn. var. *agrestis* Nanud

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*Cucumis melo* L. var. *momordica* Duthie & Fuller  
*Dactyliandra welwitschii* Hook. f.  
*Luffa acutangula* (L.) Roxb. var. *amara* (Roxb.) Clarke  
*Melothria maderaspatana* (L.) Cogn.  
*Momordica balsamina* L.  
*Momordica charantia* L.  
*Momordica dioica* Roxb. ex Willd

29. CACTACEAE  
*Opuntia elatior* Mill.

30. MOLLUGINACEAE  
*Corbichonia decumbens* (Forsk.) Jack ex. Exell  
*Gisekia pharnacioides* L. var. *pharnacioides*  
*Glinus lotoides* L.  
*Limeum indicum* Stocks ex. T. Anderson.  
*Mollugo cerviana* (L.) Seringe  
*Mollugo nudicaulis* Lamk.

31. AIZOACEAE (FICOIDACEAE)  
*Sesuvium sesuvioides* (Fenzl.) Verdc  
*Trianthema portulacastrum* L.  
*Trianthema triquetra* Rottl. ex Willd. F.N. Willd  
*Zaleya decandra* (L.) Burm. f.  
*Zaleya redimita* (Melville) Bhandari. Var. *flava*

32. RUBIACEAE  
*Borreria articularis* (Linn. f.) F.N. Willd  
*Borreria pusilla* (Wall.) DC.  
*Hedyotis corymbosa* (Linn.) Lamk.  
*Kohautia aspera* (Heyne & Roth) Berm.  
*Oldenlandia corymbosa* L.

33. ASTERACEAE  
*Ageratum conyzoides* L.  
*Bidens biternata* (Lour.) Merr. & Sherff ex Sherff  
*Blumea lacera* (Burm. f.) DC.  
*Blumea laciniata* (Roxb.) DC.  
*Caesulia axillaris* Roxb  
*Echinops echinatus* Roxb.  
*Eclipta indica* (L.) Hassk.  
*Flaveria trinervia* (Spreng.) C. Mohr.  
*Glossocardia setosa* (Linn. f.) DC.  
*Gnaphalium luteo-album* L.  
*Gnaphalium polycaulon* Pers.  
*Inula cappa* (Buch.-Ham. ex D. Don) DC.  
*Launaea resedifolia* (L.) Kuntze  
*Oligochaeta ramosa* (Roxb.) Wagenitz  
*Pegolettia senegalensis* Cass.  
*Pluchea lanceolata* (DC.) Clarke  
*Pluchea tomentosa* DC  
*Pulicaria crispa* (Forsk.) Benth & Hook.  
*Pulicaria rajputanae* Blatt. & Hall  
*Pulicaria wightiana* (DC.) Clarke  
*Sonchus asper* (L.) Hill.  
*Tridax procumbens* L.  
*Verbesina encelioides* (Cav.) Benth & Hook f. ex A. Grey  
*Vicoa indica* (L.) {Syn. *Pentanema indicum* (L.) Ling}  
*Vernonia cinerea* (L.) Less.  
*Xanthium strumarium* L. Decn.

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34. SALVADORACEAE  
*Salvadora oleoides* Decne  
*Salvadora persica* Linn.
35. APOCYNACEAE  
*Wrightia tinctoria* (Roxb.) R.Br
36. ASCLEPIADACEAE  
*Calotropis procera* (Ait. F.) sub sp. hamiltonii (Wight) Ali  
*Ceropegia bulbosa* Roxb.  
*Glossonema varians* (Stocks.) Benth  
*Leptadenia pyrotechnica* (Forsk.) Decne.  
*Pergularia daemia* (Forsk.) Chiov.
37. PERIPLOCACEAE  
*Cryptostegia grandiflora* R.Br.
38. GENTIANACEAE  
*Enicostema axillare* (Lam.) Raynal
39. BORAGINACEAE  
*Arnebia hispidissima* (Lehm) DC.  
*Heliotropium curassavicum* L.  
*Heliotropium marifolium* Retz.  
*Heliotropium ovalifolium* Forsk.  
*Heliotropium paniculatum* R. Br.  
*Heliotropium rariflorum* Stocks.  
*Heliotropium subulatum* (Hochst.exDC.) Vatke.  
*Heliotropium zeylanicum* (Burm. f.) Lam.  
*Nonea pulla* A. DC.  
*Sericostoma pauciflorum* Stocks ex Wight  
*Trichodesma ampelxicaule* Roth.
40. EHRETIACEAE  
*Cordia gharaf* (Forst.) Ehrenb. ex Asch.  
*Cordia dichotoma* Forst. f.
41. CONVULVULACEAE  
*Argyreia nervosa* (Burm.f.)  
*Convolvulus arvensis* L.  
*Convolvulus auricomus* (A.Rich) Bhandari  
var. *volubilis* (Clarke) Bhandari  
*Convolvulus deserti* Hochst. & Steud. ex Baker & Rendle  
*Convolvulus stocksii* Boiss.  
*Cressa cretica* L.  
*Evolvulus alsinoides* (L.) L.  
*Ipomoea carnea* Jacq. subsp. *fistulosa* (Mart. ex Choisy)  
*Ipomoea dichroa* (Roem & Schult) Choisy  
*Ipomoea hederifolia* L.  
*Ipomoea obscura* (L.) Ker. Gawl  
*Ipomoea pes-tigris* L.  
*Ipomoea sindica* Stapf  
*Merremia aegyptia* (L.) Urban  
*Merremia emarginata* (Burn. F.) Hall. f.  
*Rivea hypocrateriformis* (Desr.) Choisy
42. CUSCUTACEAE  
*Cuscuta hyalina* Heyne ex Roth.  
*Cuscuta reflexa* Roxb.
43. SOLANACEAE  
*Datura metel* L.  
*Datura stramonium* L.  
*Lycium barbarum* L.  
*Physalis minima* L.  
*Physalis peruviana* L.  
*Solanum albicaule* Kotschy ex Dunal in DC.  
*Solanum nigrum* L.  
*Solanum surattense* Burm. f.
- Withania somnifera* (L.) Dunal.
44. SCROPHULARIACEAE  
*Anticharis glandulosa* Asch. var. *caerulea* Blatt. & Hall.  
*Anticharis senegalensis* (Walp) Bhandari  
*Bacopa monnieri* (L.) Wettst.  
*Kickxia ramosissima* (Wall.) Zanchen  
*Lindenbergia indica* (L.) Wettst.  
*Lindernia parviflora* (Roxb.) Haines  
*Striga gesnerioides* (Willd.) Vatke  
*Verbascum chinense* (L.) Santapau  
*Veronica agrestis* L.
45. OROBANCHACEAE  
*Cistanche tubulosa* (Schrenk.) Hook. f.  
*Orobanche aegyptiaca* Pers.
46. BIGNONIACEAE  
*Tecomella undulata* (Sm.) Seem.
47. PEDALIACEAE  
*Pedaliium murex* L.  
*Sesamum indicum* L.
48. MARTYNIACEAE  
*Proboscidea louisiana* (Mill) Weston & Standley
49. ACANTHACEAE  
*Adhatoda zeylanica* Medic.  
*Barleria prionitis* L.  
*Blepharis sindica* T. Anders.  
*Justicia simplex* D. Don  
*Lepidagathis trinervis* Nees.  
*Peristrophe paniculata* (Forsk) Brummit.  
{ syn. *P. bicalyculata* (Retz) Nees}  
*Ruellia tuberosa* L.
50. VERBENACEAE  
*Clerodendrum phlomidis* L.  
*Phyla nodiflora* (L.) E. Greene
51. LAMIACEAE ( LABIATAE nom. alt.)  
*Leucas aspera* (Willd.) Link  
*Leucas urticaefolia* (Vahl.) R. Br.  
*Ocimum americanum* L.  
*Ocimum canum* Sims.  
*Salvia aegyptiaca* L.
52. NYCTAGINACEAE  
*Boerhavia diffusa* L.
53. AMARANTHACEAE  
*Achyranthes aspera* L.  
*Aerva javanica* (Burm.f.) Juss. & Schult.  
*Aerva persica* (Burm. f.) Merrill.  
*Aerva pseudotomentosa* Blatt. & Hallb.  
*Alternanthera sessilis* (L.) R.Br. ex DC.  
*Amaranthus graecizans* L. subsp.  
*hellungianus* (Nevski) Gusev  
*Amaranthus hybridus* Linn. subsp. *cruentus* (Linn.) Thell  
*Amaranthus spinosus* L.  
*Amaranthus viridis* L.  
*Celosia argentia* L.  
*Digera muricata* (L.) Mart.  
*Gomphrena celosoides* Mart  
*Pupalia lappacea* (L.) Juss.
54. CHENOPODIACEAE  
*Chenopodium album* L.  
*Chenopodium murale* L.  
*Haloxylon recurvum* (Moq.) Bunge ex Boiss.

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*Salsola baryosma* (Roem. & Schult.) Dandy*Suaeda fruticosa* (L.) Forsk.*Suaeda nudiflora* (Willd.) Moq.

## 55. POLYGONACEAE

*Calligonum polygonoides* L.*Polygonum plebeium* R.Br.*Rumex dentatus* L.

## 56. ARISTOLOCHIACEAE

*Aristolochia bracteolata* Lamk.

## 57. EUPHORBIACEAE

*Acalypha ciliata* Forsk.*Euphorbia caducifolia* Haines*Euphorbia chamatsyce* L.*Euphorbia clarkeana* Hook. f.*Euphorbia hirta* L.*Phyllanthus amarus* Klein ex Willd.*Phyllanthus fraternus* Webster*Ricinus communis* L.

## 58. MORACEAE

*Ficus bengalensis* L.*Ficus religiosa* L.

## 59. HYDROCHARITACEAE

*Hydrilla verticillata* (Linn.f.) Royle*Vallisneria spiralis* L. var. *denseserrulata*

Makino

## 60. AGAVACEAE

*Agave americana* L.

## 61. LILIACEAE

*Aloe vera* (L.) Burm. f.*Asphodelus tenuifolius* Cav.

## 62. COMMELINACEAE

*Commelina albens* Hassk.*Commelina benghalensis* L.

## 63. ARECACEAE

*Phoenix sylvestris* Roxb.

## 64. CYPERACEAE

*Cyperus arenarius* Retz.*Cyperus atkinsonii* Clarke*Cyperus irio* L.*Cyperus rotundus* L.*Cyperus triceps* (Rottb.) Endl.*Eleocharis atropurpurea* (Retz) Presl.*Scirpus lateriflorus* Gmel*Scirpus roylei* (Nees) Parker*Scirpus mucronatus* L.

## 65. POACEAE (GRAMINEAE)

*Andropogon martinii* Roxb.*Apluda mutica* L.*Aristida adscensionis* (L.) A. Camus.*Brachiaria ramosa* (L.) Stapf.*Brachiaria reptans* (L.) Gard. & C.E. Hubb.*Cenchrus biflorus* Roxb.*Cenchrus ciliaris* L.*Cenchrus segiterus* Vahl.*Chloris barbata* Sw.*Chloris virgata* Sw.*Cymbopogon martinii* (Roxb.) Wats

# Asian Resonance

*Cynodon dactylon* (L.) Pers.*Dactyloctenium aegyptium* (L.) P. Beauv.*Dactyloctenium indicum* Boiss.*Desmostachya bipinnata* (L.) Stapf.*Digitaria pennata* (Hochst.) T. Cooke*Eleusine compressa* (Forsk.) Ascher. Et Schweinf.*Eragrostis ciliaris* (L.) R.Br.*Eragrostis pilosa* (L.) P. Beauv.*Eragrostis tremula* Hochst. Nees ex Steud.*Heteropogon contortus* (L.) P. Beauv.*Paspalum paspaloides* (Michx.) Scribn*Panicum antidotale* Retz.*Perotis hordeiformis* Nees*Pennisetum americanum* (L.) Leeke*Polypogon monspeliensis* (L.) Desf.*Saccharum spontaneum* L.*Sorghum halpense* (Linn.) Pers.*Sporobolus coromandelianus* (Retz) Kunth.*Tripogon jaquemontii* Stapf

## Conclusion

It is rather surprising to note that family Leguminosae tops the list of all flowering plants in Deedwana tehsil (Table 4), while in the adjoining areas like western Rajasthan and eastern Rajasthan it is family Poaceae which occupies top position. It may be mentioned here that family Poaceae has been found to be the most dominant family in the Gangetic plains, Gujrat and Delhi regions and next position is all these regions is occupied by family Leguminosae. Thus these two families have inter changed their positions in the area presently investigated.

Family Asteraceae occupies third position in the flora of Deedwana which is in conformity with Delhi and remaining areas of Rajasthan. But the third position in the Gangetic plains and Gujrat is occupied by Cyperaceae, while in Deedwana tehsil this family has been found to occupy ninth position along with Scrophulariaceae and Solanaceae. Position of Malvaceae at eighth position is special because it occupies fourth position in western Rajasthan and in place of Malvaceae. Cucurbitaceae occupies the fourth position in present area. Similarly the position of Convolvulaceae at fifth rank is also in conformity with that of its position in the flora of western Rajasthan. The position of Cucurbitaceae in Deedwana tehsil is unique. However this family occupies tenth rank in Jaipur region and ninth rank in western Rajasthan. Boraginaceae occupies seventh position in the flora of Deedwana tehsil. The position of family Amaranthaceae is also unique which occupies sixth rank. Flora of western Rajasthan on the whole is referred to as "Grass Legume" type. But in Deedwana tehsil which is a part of Nagaur district which in turn is a segment of western Rajasthan may be referred to as "Legume-Grass" type on the basis of dominance of legumes in its flora followed by grasses.

**Table-2: Proportional Relationship of Dicotyledonous and Monocotyledonous Taxa in Deedwana Tehsil**

Groups	Families		Genera		Species	
	NO.	Percentage	NO.	Percentage	NO.	Percentage
Dicotyledonous	58	89.32	185	84.86	284	85.80
Monocotyledonous	7	10.77	33	15.13	47	14.19
TOTAL	65	100%	218	100%	331	100%

**Table-3: Statistical Synopsis of the Indigenous Flora  
(Number of Genera and Species in Each Family)**

S.No.	Family	Genus/Genera	No. of Species
1.	Menispermaceae	2	3
2.	Papaveraceae	1	1
3.	Fumariaceae	1	1
4.	Brassicaceae	2	2
5.	Cleomaceae	1	6
6.	Capparaceae	3	4
7.	Polygalaceae	1	2
8.	Caryophyllaceae	3	3
9.	Portulacaceae	1	3
10.	Tamaricaceae.	1	2
11.	Elatinaceae	1	2
12.	Malvaceae.	6	10
13.	Tiliaceae	2	6
14.	Zygophyllaceae	4	6
15.	Oxalidaceae	1	1
16.	Simaroubaceae	1	1
17.	Balanitaceae	1	1
18.	Burseraceae	1	1
19.	Meliaceae	2	2
20.	Celastraceae	1	1
21.	Rhamnaceae	1	2
22.	Moringaceae	1	1
23.	Fabaceae	16	33
24.	Caesalpinaceae	3	3
25.	Mimosaceae	6	12
26.	Combretaceae	1	1
27.	Lythraceae	1	1
28.	Cucurbitaceae	10	17
29.	Cactaceae	1	1
30.	Molluginaceae	5	6
31.	Aizoaceae	3	5
32.	Rubiaceae	4	5
33.	Asteraceae	21	26
34.	Salvadoraceae	1	2
35.	Apocynaceae	1	1
36.	Asclepiadaceae	5	5
37.	Periplocaceae	1	1
38.	Gentianaceae	1	1
39.	Boraginaceae	5	11
40.	Ehretiaceae	1	2
41.	Convolvulaceae	7	16
42.	Cuscutaceae	1	2
43.	Solanaceae	5	9
44.	Scrophulariaceae	8	9
45.	Orobanchaceae	2	2
46.	Bignoniaceae	1	1
47.	Pedaliaceae	2	2
48.	Martyniaceae	1	1
49.	Acanthaceae	7	7
50.	Verbenaceae	2	2
51.	Lamiaceae	3	5
52.	Nyctaginaceae	1	1
53.	Amaranthaceae	8	13
54.	Chenopodiaceae	4	6
55.	Polygonaceae	3	3



56.	Aristolochiaceae	1	1
57.	Euphorbiaceae	4	8
58.	Moraceae	1	2
59.	Hydrocharitaceae	2	2
60.	Agavaceae	1	1
61.	Liliaceae	2	2
62.	<b>Commelinaceae</b>	1	2
63.	Areaceae	1	1
64.	<b>Cyperaceae</b>	3	9
65.	<b>Poaceae (Gramineae)</b>	23	29
<b>Total</b>		218	331

**Table 4. Synopsis of the Indigenous Flora**  
**Ten dominant familie of Deedwana Tehsil and Adjoining Regions**  
**(Family Leguminoseae here includes the three Families Fabaceae,**  
**Caesalpinaceae and Mimosaceae Taken Together)**

Position	Gangetic plain (Hooker, 1907)	N. Gujrat (Sexton & Sedgwick, 1918)	Delhi (Maheshwari, 1963)	Jaipur (Sharma & Tiagi, 1979)	W. Rajasthan (Bhandari, 1990)	Deedwana tehsil (Present work)
1	Poaceae	Poaceae	Poaceae	Poaceae	Poaceae	Leguminoseae
2	Leguminoseae	Leguminoseae	Leguminoseae	Leguminoseae	Leguminoseae	Poaceae
3	Cyperaceae	Asteraceae	Asteraceae	Asteraceae	Asteraceae	Asteraceae
4	Asteraceae	Cyperaceae	Cyperaceae	Cyperaceae	Cyperaceae	Cucurbitaceae
5	Scrophulariaceae	Convolvulaceae	Acanthaceae	Acanthaceae	Convolvulaceae	Convolvulaceae
6	Malvaceae.	Euphorbiaceae	Euphorbiaceae	Euphorbiaceae	Malvaceae	Amaranthaceae
7	Acanthaceae	Acanthaceae	Amaranthaceae	Boraginaceae	Euphorbiaceae	Boraginaceae
8	Euphorbiaceae	Malvaceae.	Malvaceae	Malvaceae	Acanthaceae	Malvaceae
9	Convolvulaceae	Scrophulariaceae	Amaranthaceae	Amaranthaceae	Cucurbitaceae	Scrophulariaceae Solanaceae Cyperaceae
10	Lamiaceae	Amaranthaceae	Scrophulariaceae	Cucurbitaceae	Amaranthaceae	Euphorbiaceae

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