P: ISSN No. 0976-8602 RNI No.UPENG/2012/42622 VOL.-7, ISSUE-2, April-2018

E: ISSN No. 2349-9443 Asian Resonance

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

Jehangeer Rehman Quereishi
Associate Professor,
Deptt.of Botany
Government Bangur College,
Deedwana, Nagaur,
Rajasthan

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 $23^0$3'N and $30^0$12'N latitude and $69^0$30E and $78^0$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 470 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.

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 comparision 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 of 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, Albizzia lebbeck,* 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 tenex*, and Tikli dungari is dominated by *Acacia tortalis* and *Maytenus emarginatus,* although other trees and shrubs like *Acacia leucophloea, Prosopis cineraria, Grewia tenex, 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, Boraginaceaea, 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, Peristrphe 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 twiners 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

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 intresting 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 ans 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
    Azadiractha 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

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 schimperi (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 lebbeck (L.) Benth.
Mimosa hamata Willd.
Leucaena latisiliqua (L.)Gillis.
Pithecellobium dulce (Rox b.) Benth.
Prosopis chielensis (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
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.
Momordicacharantia 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
Pluchae tomentoda 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.

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.
Heliotropiumsubulatum(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. CONVOLVULACEAE
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
Pedalium 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.

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 amerus Klein ex Willd.
Phyllanthus fraternus Webster
Ricinus cummunis L.

58. MORACEAE
Ficus bengalensis L.
Ficus religiosa L.

59. HYDROCHARITACEAE
Hydrilla verticillata (Linn.f.) Royle
Vallisnaria spiralis L.var.denseserrulata Makino

60. AGAVACEAE
Agave americana L.

61. LILIACEAE
Aloe vera (L.) Burm. f.
Asphodelus tenuifolius Cav.

62. COMMELINACEAE
Commelina albescens 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 martnii 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
Cynodon dactylon (L.) Pers.
Dactyloctenium aegyptium (L.) P. Beauv.
Dactyloctenium sindicum 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.
Eragrostls tremula Hochst. Nees ex Steud.
Heteropogon contortus (L.)P. Beauv.
Paspalidium paspaloides (Michx.) Schribn
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 confirmity 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 Convolulaceae at fifth rank is also in confirmity 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.	Zygophylaceae	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.	Caesalpiniaceae	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.	A Izoaceae	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.	**Commelinaceae**	1	2
63.	Arecaceae	1	1
64.	**Cyperaceae**	3	9
65.	**Poaceae (Gramineae**)	23	29
Total		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

Acknowledgement

I am thankful to Dr. C. B. Gena, Ex Vice Chancellor, Bikaner University, Bikaner for his valuable guidance.

References

1. *Bhandari, M. M. (1990): Flora of the Indian desert. Revised edition. MPS Repros, 39 BGKTExtn, New Pali Road, Jodhpur. P 435*
2. *Blatter, E. J. and Hallberg, F. (1918-21): Flora of the Indian desert (Jodhpur and Jaisalmer) J. Bombay Nat.Hist.Soc; 26:218-246.tt.1-12.1918; 525-551, tt.13-25; 811-818, tt.26-31.1919; 968-987.1920; 27:40-47; 270-289, tt.32-34.1920; 506-519.tt.35-37.1921.*
3. *Jain, S.K. &. Rao, R.R. 1976. A Hand-book of Field and Herbarium method. Today and Tomorrow Pub., New Delhi.*
4. *Pandey, R.P. & Singh, V.1989. Further contri-bution to the flora of Pali district, Rajasthan. J. Econ. Taxon. Bot. 13 (1) : pg. 1-9.*
5. *Parmar, P.J. & Singh, A.N. 1982. A contri-bution to the flora of Bhilwara district, Rajasthan. Ibid. 3: pg. 491-516.*
6. *Parmar et al 1985. Studies on the vegetation of Bikaner district in Rajasthan. J. Econ. Taxon. Bot. 7(1) : pg. 55-67.*
7. *Sharma & Aggarwal, 2008, J. Econ. Taxon. Bot. vol 32. pg. 359-374.*
8. *Shetty, B.V. &. Pandey, R.P 1983. Flora of Tonk district, Rajasthan. BSI, Howrah.*
9. *Shetty, B. & Singh, V. 1987-93. Flora of Rajasthan 3 Vols. BSI, Howrah.*
10. *Singh, B.P. & Dhillon, K.B.S 1989. A contribution to the flora of Ganganagar (Rajasthan). J.Bombay Nat. Hist. Soc. 81: pg. 473-475.*
11. *Singh, V. 1983. Flora of Banswara district, Rajasthan. BSI, Howrah.*
12. *Vyas, B.L. et al. 1985. A contribution to the flora of Jalore district, Rajasthan. J. Econ. Taxon. Bot. 6: pg. 283-324.*
13. *Quereishi, J. (2002): Taxonomical and ecological studies of vegetation of Deedwana Tehsil, district Nagaur, Rajasthan.(Unpublished thesis), M D S University, Ajmer.p-201.*
14. *Quereishi, J. and Vyas, A. (2017): Sustainable development of Vegetations and Grounwater in Didwana block of Nagaur District, Central Part of Rajasthan, India. Remarking An Analisation Vol 2 ISSUE-8 November 2017 pp. 17-23.*
15. *Quereishi, J. (2018): Vegetation of Deedwana Tehsil, Nagaur District, Rajasthan, Indi**a** Asian Resonance Vol.-7, ISSUE-5, January-2018 p-18-23.*