

TREE FLORA OF JHALAWAR DISTRICT (RAJASTHAN) – WITH REFERENCE TO FLORISTIC DIVERSITY AND PHYTOGEOGRAPHY

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A B S T R A C T

Studies regarding the floristic diversity and phytogeographical affinities of Jhalawar district tree flora reveal that out of 182 upper storey cover species recorded in the area, 31 species were planted (cultivated) for various economic uses, while 151 species were found naturalized in the the area, 29 of the naturalized species, were also planted for edible fruits or as avenue trees or for timber in different parts of the district. 27 species were found growing near streams, rivers or in low lying areas, while 88 species were recorded in deciduous forests & hills tracts. On the contrary 37 upper storey cover species were observed in open, dry, gravelly and in other xeric conditions e.g. scrubby vegetations. 89 tree species were microphanerophytes, (Mi) 69 species demarcated as mesophanerophytes (Ms) and only 24 remaining species were reported to be megaphanerophytes (Mg) (large sized trees). Phenological studies about tree-flora indicated that flowering of 30 species initiated in rainy season, 70 species bloom in summer, 8 species flower round the year, while maximum, 74 species are laden with flowers in winter season, possibly due to photoperiodic temperature, humidity and light intensity requirements of these species. Possible reasons and plausible assumptions about the habit, habitat and physiognomy diversities have also been described. Exceptional presence of some species e.g. *Adansonia digitata*, (Tropical Africa), *Prosopis cineraria* (Arid zone species), *Adina cordifolia* and *Mangifera indica* (Subtropical forests), add new dimensions to the floristic diversity of the area as well as this may be due to the phytogeographical location of the locality which represents 1 : 1 ratio between eastern and western elements.

INTRODUCTION

In forest ecosystem upper storey cover species (trees) play an important role by balancing the distribution of different plants and animals of the unique and self-sustaining ecological entity. These are basis of our life, feather in the crown of ecosystem, grace and glory of mother earth. They not only provide us soothing

touch in their shade, but also provide invaluable gifts in the form of food, timber, fuel, medicines, as well as cattle fodder. In gardens, avenues and on roadsides trees enhance the aesthetic beauty, due to their attractive flowers, fragrance and their lush green appearance. These fascinating components of ecosystem infuse new spirit and enthusiasm through gently blowing cool breeze. The twittering birds on their branches present the melodious music of friendship and fraternity to every one.

STUDY AREA

District Jhalawar one of the four districts of Kota division (Rajasthan) is situated within 75° 51' - 76° 95' E longitudes and 23° 45' - 24° 55' N latitudes. It lies in the south-eastern corner of the state adjacent to the northern edge of the Deccan Plateau and has an area of 6323.13 km² (Map I). Average annual rainfall in the area recorded is 925 mm, the temperature fluctuates between 4.9°C (during winter season) to 47.5°C (in summer season). The soil is fertile with highest fertility status in the state. The area is traversed by Mukundara ranges, (the hills of Vindhyan system), from the northern boundaries of Manoharthana, proceed to Jhalarapatan and Jhalawar ranges and leave the district Jhalawar, to enter in Kota district near Khokanda.- Dhanwas. These hills derive their name from famous Darah pass in Kota district. The slopes of Mukundaras are thickly forested. Dense vegetation and large number of wild animals are salient features of these ranges. Besides this, perennial rivers e.g. Kalisindh, Parwan, Ujad and Chambal (in Gangdhar tehsil) along with numerous seasonal rivers, rivulets, nalas, ponds and lakes make the abundance of water reservoirs in the area. Although open, dry, and wastelands are observed in patches here and there which support the growth of scrubby vegetation.

Major forests are of dry-deciduous or mixed deciduous type consisting of *Anogeissus pendula* in pure strands or mixed with *Diospyros melanoxylon* and *Tectona grandis*. The major upper storey cover species of these localities are *Acacia catechu*, *Anogeissus latifolia*, *Butea monosperma* and *Madhuca indica* which are uniformly distributed in the forests of the district.

PREVIOUS WORK

General surveys about upper storey cover species of Jhalawar district were previously made by Majumdar (1971, 1976 and 1980), Maheshwari & Singh (1976),

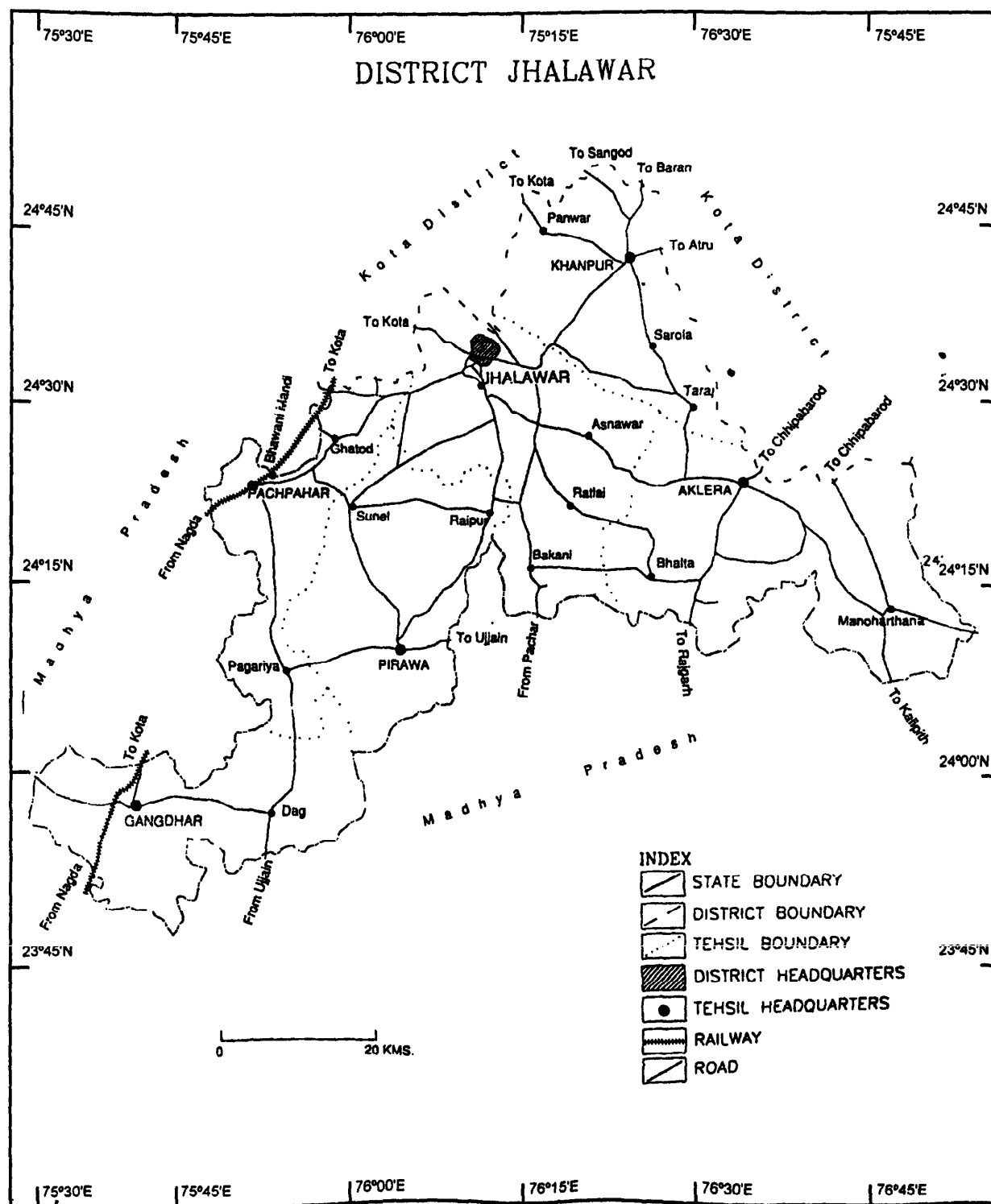


Fig.1 : Map showing the location of study sites in Jhalawar district (Rajasthan).

Sharma (1986), Shringi (1986), Agarwal (1981), Gandhi (1989) and by Shetty and Singh (1987, 1991 and 1993), during their plant explorations in Jhalawar district. However, none of these workers could interpret the diversified aspects *e.g.* physiognomy, phenology, habitat and their distributional variations in tree vegetations of different localities. Considering all these facts, the present course of studies were pursued by author, during his plant exploration trips of Jhalawar district in different seasons. The plants collected during these visits were duly identified, preserved and deposited in the "Herbarium, Department of Botany, University of Rajasthan, Jaipur (RUBL)" These upper storey cover (trees) species are listed according to their systematic position, alongwith their habitat, locality, specimen voucher no's., phenology, distribution and economic uses in the area. Their local names have also been provided (Table I).

RESULTS AND DISCUSSION

Floristic studies about upper storey cover species of the area during plant explorations revealed that 182 species of Angiospermic trees are recorded in the area, which belong to 131 genera of 51 families. The dicots are represented by 173 tree species belonging to 123 genera and 47 families, while monocots are having meagre representation comparatively, *i.e.* only 9 species of 8 genera and 4 families. The higher representation of dicots in the area may be attributed to the habit, and life duration of monocots as well as their requirements of sunlight, water and minerals. Therefore, most of the monocot species are annual grasses and herbs.

Out of the 182 species recorded in the area, 31 species are exclusively in cultivation or planted for the various purposes *e.g.* timber, wood, cattle fodder, edible fruits or for ornamental purposes as avenue trees. 118 tree species are found in naturalized conditions in the area while 29 tree species are found growing in natural conditions, as well as cultivated or planted also for various uses. *e.g.* for ornamental purpose (*Nyctanthes arbor-tristis* and *Cassia fistula*), edible fruits, (*Cordia dichotoma*), religious importance (*Ficus benghalensis*, *Ficus religiosa* and *Emblica officinalis*) and for some other purposes. Besides this, there are some trees, which were previously introduced to the area but now established themselves successfully in the area. This may be due to their degree of acclimatization towards the soil, physiography and climate of the area. Careful analysis about the habitat

diversity of these species indicate that out of 182 tree species of the area, 27 species are recorded in wet and shady habitats near water courses and streams, or in low lying areas. While 88 species are observed in deciduous or mixed deciduous forests and remaining 37 species in dry, waste, gravelly or scrubby areas. Higher number of tree flora in forest conditions may be attributed to higher annual rainfall and soil conditions in these localities; the presence of lesser number of tree species in dry and gravelly places or in xeric conditions may be attributed to soil composition (rocky or gravelly) as well as long dry spells and extremes of temperature in these localities.

During the regular visits of the area, it was also observed that some of the tree species were found growing luxuriently on the walls of forts, monuments and old buildings in the locality. This peculiar phenomenon was observed in *Ficus benghalensis*, *Ficus religiosa*, *Holoptelea integrifolia*, *Boswellia serrata*, *Salvadora oleoides* and some other species. Although *Ficus benghalensis* and *Ficus religiosa* are normally found growing on the walls of old buildings in other localities also, but presence of *Boswellia serrata* growing on walls of Shikargah or Chi ka Chabutara and *Salvadora oleoides* on the walls of Gageron fort seems to be somewhat unique and astonishing. This unusual habitat diversity of these species may be attributed to dispersal of their seeds through the faeces of birds and other animals in these spots. Later on after germination the seedlings and plantlets might have found here proper conditions of food and minerals. These would have been safest shelter places for these plant individuals, therefore, these spots might have developed as typical ecological niches of these tree species, probably might be due to their preference to calcicolous edaphic environment.

The studies about physiognomic diversity amongst upper storey cover species of the area reflect that 89 species are of small trees, Microphanerophytes (Mi), and 69 species belong to medium sized trees Mesophanerophytes (Ms) having height from 15-25 m, while large sized species Megaphanerophytes (Mg) are much poorer in their representation (only 9 species naturalized to area, remaining 15 species are cultivated). This depicts to the adverse climatic conditions of relative humidity, light intensity and larger rocks in the area which make the penetration of roots much difficult.

Phenology (Flowering and fruiting) investigations exhibit that 30 species have their flowering in rainy season, 70 species bloom with flowers in summer, 74 species initiate their flowering in winter season, while remaining 8 species show flowering and fruiting round the year. This may be correlated with photoperiodic, temperature, humidity & water requirements of respective tree species in different seasons, for initiation of flowering in them. While studying about floral colour diversity in these tree species, it has been observed that species with yellow and white coloured flowers dominate the scene (66 species each), followed by green (15), red (10), pink (8), purple and maroon (7 species each) and remaining 3 species observed with orange coloured flowers. This may be attributed to their pollination requirements and intensity of light as well as ratio of organic and mineral substances in the soil. Interestingly the cases of differences in the flower colours among the same species were observed during the plant explorations. Some of the examples are *Kydia calycina* (pink and white) and *Thevatia peruviana* (yellow, orange yellow, and cream coloured flowers). This may be due to their genetic diversity, the change of colouration might have been induced due to environmental changes initially, and later on it was inherited in succeeding generations due to change in the arrangement of genes, responsible for flower colours.

Of the total 182 upper storey cover species, twenty three species are endemic to Indian subcontinent (Sharma 1983), *Miliusa tomentosa*, *Dalbergia sericea*, *Soymida febrifuga* and *Buchanania lanzan* are few examples to be mentioned. In the area under study this figure works out to be 13%, which is much less in comparison to the percentage of Indian flora (50%). Probably this may be due to representation of few himalayan elements, as well as introduction of some exotic species in the area. These factors once again influence the floristic diversity of the area as far as representation of species is concerned.

A critical analysis of the vegetation reveals that the forests are of mixed deciduous type in most of the area, showing altitudinal zonation and diversity of the vegetation to the extent that *Adina*, *Aegle*, *Boswellia*, *Buchanania lanzan*, *Cassia fistula*, *Dendrocalamus*, *Diospyros*, *Lagerstroemia*, *Lannea* and *Sterculia* etc. are more abundant in the middle zone, while *Acacia leucophloea*, and *Butea monosperma* etc. are abundant at the foot or outskirts. *Anogeissus pendula* is the dominant species of these forests extending right from the base to the top of the

Table –1. Check-List of Upper Storey Cover (Trees) of Jhalawar District

Sl. No.	Scientific Name, Common Name, Habit and Habitat, Specimen voucher No.	Flowering & Fruiting	Distribution	Other Information & local use
1	2	3	4	5
I-ANNONACEAE				
1.	<i>Annona reticulata</i> L. 'Ramphal' Medium sized tree. Jhalarapatan NKS 1477	July-Sept. Fls. green	Neotropical	Shade and edible fruits rare in forests.
2.	<i>Annona squamosa</i> L. 'Sitaphal' Small tree on hill slopes, Gindore, NKS 284-A	May-Oct. Fls. green	Neotropical	Edible fruits, common in forests.
3.	<i>Artabotrys hexapetalus</i> (L.f.) Bhandari 'Nagchampa, Kharbuja Champa' Small Tree, Rain Basera NKS 222	Apr.-Aug. Fls. green	Paleotropical	Cultivated, ornamental.
4.	<i>Miliusa tomentosa</i> (Roxb.) J. Sinclair 'Kari, Kirua' Medium sized tree of deciduous forests. Monohar Thana OPS 848	Apr.-Aug. Fls. greenish	Indian	Endemic, wood.
5.	<i>Polyalthia longifolia</i> (Sonn.) Thwaites 'Asapala Ashok' Medium sized ever green tree rarely found naturalized in forests. Bijliya Bhada, Jhalawar NKS 906	Feb.-Aug. Fls. yellowish green	Paleotropical	Cultivated as avenue tree.
II-CAPPARIDACEAE				
6.	<i>Capparis decidua</i> (Forssk.) Edgew. 'Kair, Teti'	Nov.-July Fls. crimson	Paleotropical Boreal	Fruits edible, wood for implements.

1	2	3	4	5
	Small tree, of dry & gravelly places. Hospital Campus, Jhalawar NKS 468			
7.	<i>Crateva adansonii</i> DC. 'Barna' Medium sized tree, of deciduous forests. Chhoti Kothi NKS 1256	Apr.-July Fls. yellow	Neotropical	Used as timber.
III-COCHLOSPERMACEAE				
8.	<i>Cochlospermum religiosum</i> (L.) Alston 'Ginar' A small deciduous tree rare in forests. Included on authority of Agrawal (1981)	Jan.-Apr. Fls. golden yellow	Neotropical	Fuel and Timber.
IV-BIXACEAE				
9.	<i>Bixa orellana</i> L. 'Sinduria' Small tree, Lalbag Jhalapatan NKS 1807	Jan.-Apr. Fls. pink or white	Neotropical	Cultivated, ornamental.
V-FLACOURTIACEAE				
10.	<i>Flacourtia indica</i> (Burm.f) Merr. 'Katia' Small tree, in forests, hill slopes Jhirniya NKS 1300	Jan.-June Fls. greenish yellow	Paleotropical	Fuel.
11.	<i>Casearia elliptica</i> Willd. 'Chilla' Small tree, rare on dry Hill slopes. Jhalawar, Bakani NKS 1497	Feb.-May Fls. greenish yellow	Paleotropical	Fuel.
VI-TAMARICACEAE				
12.	<i>Tamarix aphylla</i> (L.) Karst.	Dec.-April	Paleotropical	Soil conservation.

1	2	3	4	5
	'Farash' Small tree, Nala, Jhalawar NKS 310	Fls. pink		
13.	<i>Tamarix dioica</i> Roxb. 'Jhau' A small tree on river beds. River Kalisindh, Jhalawar NKS 479	April-Aug. Fls. pink or dark pink	Paleotropical	Soil conservation fuel.
VII-MALVACEAE				
14.	<i>Kydia calycina</i> Roxb. 'Pola' A medium sized tree, rare in forests. Included on authority of Agrawal (1981)	Oct.-Jan. Fls. pink or white	Indian Paleotropical	Timber.
15.	<i>Thespesia lampas</i> (Cav.) Dalz. & Gibs. 'Bankapas' A small tree, rare in deciduous forest. Included on authority of Agrawal (1981)	Nov.-Apr. Fls. yellow	Paleotropical	Fuel fibre.
16.	<i>Thespesia populnea</i> (L.) Soland. & Corr. 'Paras pipal' A small tree, rare in wastelands. Kumhar Mohalla, Jhalawar NKS 819	Oct.-Mar. Fls. yellow	Paleotropical	Sometimes cultivated ornamental.
VIII-BOMBACACEAE				
17.	<i>Adansonia digitata</i> L. 'Kharsan aamli, Kalpvriksha' A large sized deciduous tree, rare in forests. Dag, Jhalawar NKS 1709	Apr.-Dec. Fls. white	Paleotropical	Pulp of fruit edible.
18.	<i>Bombax ceiba</i> L. 'Semal'	Mar.-June Fls. red	Paleotropical	Fibre used for medicines.

1	2	3	4	5
	Large tree common in forests. Radi Jhalawar NKS 646			
19	<i>Ceiba pentandra</i> (L.) Gaertn. 'Safed Semal' A tall tree with green stem. Mangalpura, Jhalawar NKS 1707	Jan.-May Fls. white	Neotropical	Cultivated ornamental fibre.
IX-STERCULIACEAE				
20.	<i>Eriolaena hookeriana</i> Wt. & Arn. 'Buti' A small tree with hairy young shoot Common in deciduous forests. Chhapi Dam Side, Jhalawar NKS 1378	Mar.-May Fls. yellow	Paleotropical	Fodder, medicine.
21.	<i>Guazuma ulmifolia</i> Lamk. 'Rudraksh' A small deciduous tree. Rare in forests. Gangakund, Jhalawar NKS 1378	Oct.-Feb. Fls. pinkish	Neotropical	Shade as avenue tree.
22.	<i>Helicteres isora</i> L. 'Marorphali' Small tree, common in forests. Gindore NKS 988	Aug.-Nov. Fls. scarlet	Paleotropical	Medicinal importance.
23.	<i>Pterospermum acerifolium</i> Willd. 'Kanak Champa' A medium sized tree, grey bark. Jhalawar Verma 3500 (BSA)	Mar.-Aug. Fls. white	Paleotropical	Rare in forests, planted for shade.
24.	<i>Sterculia urens</i> Roxb. 'Kadaya' A medium sized tree, with papery bark. Common in deciduous forests. Lotia Jhir, Jhalawar NKS 470	Dec.-Apr. Fls. yellow to olive yellow	Paleotropical	Gum, extraction gum katira.
25.	<i>Sterculia villosa</i> Roxb. ex DC.	Mar.-Dec.	Paleotropical	Fibre from bark.

1	2	3	4	5
	'Udal' A medium sized tree with brown bark. Rare in forests. Manohar thana NKS 1705	Fls. yellow with pink tinge		
X-TILIACEAE				
26.	<i>Grewia abutilifolia</i> Vent. ex Juss. 'Gangeti' A small tree, rare in forests. Doongargaon, Jhalawar NKS 853	Mar.-Dec. Fls. yellow	Paleotropical	Medicinal use.
27.	<i>Grewia damine</i> Gaertn. 'Tamthor' Small tree rare in forests. Ghatoli, Jhalawar NKS 851	Jan.-Oct. Fls. yellow	Paleotropical	Wood.
28.	<i>Grewia flavescens</i> A. Juss. 'Damari' Small tree with hairy branches. Common in deciduous forests. Bagher, Jhalawar NKS 2021	Aug.-Nov. Fls. yellow	Paleotropical	Wood.
29.	<i>Grewia hirsuta</i> Vahl 'Gursharia' Small tree, rare in forests. Bijiliya Bhadak, Jhalawar OPS 736	July-Sept. Fls. bright yellow	Paleotropical	Wood.
30.	<i>Grewia polygama</i> Roxb. 'Jhanjna' Small tree with tomentose branches. Included on authority of Agrawal (1981)	July-Sept. Fls. yellow	Paleotropical	Wood.
31.	<i>Grewia sclerophylla</i> Roxb. ex G. Don 'Dhaman' Small tomentose tree, rare in forests. Jhirniya Jhalawar, NKS 151	Apr.-July Fls. yellow	Paleotropical	Edible fruits.

1	2	3	4	5
32.	<i>Grewia subinaequalis</i> DC. 'Phalsa' Small tree common in forests hill slopes. Jhirniya, Jhalawar NKS 1444	Nov.-May Fls. Yellow	Paleotropical	Edible fruits.
33.	<i>Grewia villosa</i> Willd. 'Gangeran' Small tree occasional in forests. Included on authority of Agrawal (1981)	June-Sept. Fls. yellow	Paleotropical	Medicinal value.
XI-AVERRHOACEAE				
34.	<i>Averrhoa carambola</i> L. 'Kamrakh' Small tree with drooping branches. Diwan saab ki haveli, Jhalawar NKS 902	July-Dec. Fls. pink purple	Indomalayan	Cultivated.
XII-RUTACEAE				
35.	<i>Aegle marmelos</i> (L) Corr. 'Bel' Medium sized thorny deciduous tree. Common in forests. Khandya, Jhalawar NKS 450	Jan.-July Fls. creamy white	Paleotropical	Religious importance, medicinal value, edible fruits.
36.	<i>Clausena pentaphylla</i> DC. 'Ratanjot' Small tree, rare in forests. Included on authority of Agrawal (1981)	Jan.-July Fls. yellow	Paleotropical	Medicinal value.
37.	<i>Citrus aurantium</i> L. 'Santara, Narangi' Small thorny tree, Jhalawar NKS 735	Jan.-June Fls. white	Paleotropical	Cultivated edible fruits.
38.	<i>Citrus medica</i> L., 'Nimbu' Small thorny tree, Jhalawar NKS 733	Jan.-June Fls. white	Paleotropical	Cultivated edible fruits.

1	2	3	4	5
39.	<i>Citrus sinensis</i> (L.) Obeck. 'Mousambi' Small thorny tree, Jhalawar NKS 737	Jan.-Sept. Fls. white	Paleotropical	Cultivated edible fruits.
40.	<i>Feronia limonia</i> (L.) Swingle 'Kainthi' Medium sized spiny tree, frequent in forests. Khandya, Jhalawar NKS 710	Mar.-Oct. Fls. pale green	Paleotropical	Edible fruits.
41.	<i>Murraya koenigii</i> (L.) Spreng. 'Mitha Neem' Small tree, occasional in forests. Balgadh, Jhalawar NKS 948	Apr.-June Fls. creamy white	Paleotropical	Leaves added in vegetable for flavour, planted.
42.	<i>Murraya paniculata</i> (L.) Jack 'Jaswanti, Kamini' Small tree. Radi, Jhalawar NKS 830	May-Sept. Fls. white	Paleotropical	Cultivated, ornamental.
43.	<i>Naringi crenulata</i> (Roxb.) Nicolson 'Chhota kaith' Small tree, with spines, Gopalapura NKS 712	May-Sept. Fls. white	Paleotropical	Edible fruits.
XIII-SIMAROUBACEAE				
44.	<i>Ailanthus excelsa</i> Roxb. 'Arru' Tall deciduous tree, common in forests. Bagher, Jhalawar NKS 1161	Mar.-May Fls. yellow	Paleotropical	Leaves for cattle fodder, wood.
XIV-BALANITACEAE				
45.	<i>Balanites aegyptiaca</i> (L.) Del. 'Hingota' Small tree. Jhirniya, Jhalawar NKS 486	Mar.-July Fls. greenish yellow	Paleotropical	Fruits used as soap.

1	2	3	4	5
XV-BURSERACEAE				
46.	<i>Boswellia serrata</i> Roxb. ex Coleb. 'Salar' Medium sized deciduous tree. Common in dry deciduous forests. Shikargah, Jhalawar NKS 1381	Dec.-Apr. Fls. white	Paleotropical	Gum used in medicine extract.
47.	<i>Commiphora wightii</i> (Arn.) Bhandari 'Guggal' Small tree, bark peeling off in flakes. Rare in forest. Hills near nursery, Jhalawar NKS 2100	Jan.-May Fls. creamy white	Paleotropical	Medicinal value, edible fruits.
48.	<i>Garuga pinnata</i> Roxb. 'Ghogar' Medium sized tree, rare in forests. Lakshmipura, Jhalawar OPS 839	Jan.-May Fls. creamy white	Indomalayan	Wood timber, edible fruits.
XVI-MELIACEAE				
49.	<i>Azadirachta indica</i> A. Juss. 'Neem' Tall evergreen tree common. Radi, Jhalawar NKS 216	Mar.-July Fls. white	Paleotropical	Shade, wood, timber, medicine.
50.	<i>Melia azedarach</i> L. 'Bakain Neem' Medium sized deciduous tree. Rare in waste places. Bakani, Jhalawar NKS 492	Mar.-Oct. Fls. lilac	Paleotropical	Shade, wood.
51.	<i>Soyimida febrifuga</i> (Roxb.) A. Juss. 'Rohan' Tall tree, rare in forests. Included on authority of Agrawal (1981)	Feb.-June Fls. greenish white	Indian	Endemic, timber for furniture.
52.	<i>Toona ciliata</i> Roem. 'Toon'	Apr.-July Fls. white	Trop. Asia, Australia	Timber for furniture.

1	2	3	4	5
	Medium sized tree rare in forests. Hills near nursery, Jhalawar <i>NKS</i> 2003			
	XVII-CELASTRACEAE			
53.	<i>Cassine glauca</i> (Rottb.) Kuntze 'Jamrasi' A medium sized tree, rare in forests. Bijliya Bhadak, Jhalawar <i>Wadhwa</i> 7588 (BSA)	Sept.-Nov. Fls. greenish yellow	Trop Asia, Australia	Wood timber.
54.	<i>Maytenus emarginatus</i> (Willd.) Ding.-Hou. 'Baikal' Small tree in open forests, waste places. Lotiajhir, Jhalawar <i>NKS</i> 1452	Nov.-Mar. Fls. greenish yellow	Trop Asia, Australia	Fruits and weeds, medicinal value.
	XVIII-RHAMNACEAE			
55.	<i>Ziziphus mauritiana</i> Lamk. 'Badabor' A small erect tree, in out skirts of forests. Jhirniya, Jhalawar <i>NKS</i> 2003	Sept.-Feb. Fls. greenish yellow	Trop Asia, America	Fruits edible, cultivated.
56.	<i>Ziziphus xylopyrus</i> (Retz.) Willd. 'Gat bor' Small erect tree, low hills in forests. Jhirniya, Jhalawar <i>NKS</i> 2003	Oct.-Jan. Fls. greenish yellow	Trop Asia, America	Edible, fruits.
	XIX-SAPINDACEAE			
57.	<i>Sapindus emarginatus</i> Vahl 'Ritha' Medium sized tree of deciduous forests. Guda, Jhalawar <i>NKS</i> 442	Aug.-Dec. Fls. whitish green	Paleotropical	Fruits used as soap, shade.

1	2	3	4	5
58.	<i>Sapindus laurifolius</i> Vahl 'Ritha' Medium sized tree, rare in forests. Mandwar, Jhalawar, NKS 444	Aug.-Mar. Fls. white	Paleotropical	Fruits used as soap, shade.
59.	<i>Schleichera oleosa</i> (Lour) Oken. 'Kusum' Tall deciduous tree, occasional in forests. Jhirniya NKS 1313	Mar.-June Fls. pale yellow	Paleotropical	Fruits edible, seed oil for soap making.
XX-ANACARDIACEAE				
60.	<i>Buchanania lanzan</i> Spreng. 'Char, Chironji' Medium sized tree, common in forests Gindore NKS 1297	Dec.-Apr. Fls. greenish white	Paleotropical	Fruits and seeds edible.
61.	<i>Lannea coromandelica</i> (Houtt.) Merril. 'Gurjan, Jhingan' Medium sized tree, common in forests. Lotiajhir, Jhalawar NKS 1305	Jan.-June Fls. yellow	Paleotropical	Timber fuel.
62.	<i>Mangifera indica</i> L 'Aam' Large tree, rare in forests. Khasa Radi, Jhalawar NKS 1161	Feb.-July Fls. greenish yellow	Paleotropical	Cultivated timber, shade, edible, fruits.
XXI-MORINGACEAE				
63.	<i>Moringa concanensis</i> Nimmo ex Dalz. & Gibs. 'Sainjan' Medium sized tree of forests. Khasa Radi, Jhalawar NKS 1159	Jan.-July Fls. pale yellow	Madagascar, Asia minor	Fls. & Fruits used as vegetables, medicinal value.

1	2	3	4	5
64.	<i>Moringa oleifera</i> Lamk. 'Sahjana' Medium sized tree, found in wastelands. Hospital campus, Jhalawar NKS 1161	Jan.-July Fls. pale yellow	Madagascar, Asia minor	Cultivated, Fls. & Fruits used as vegetables.
XXII-FABACEAE				
65.	<i>Butea monosperma</i> (Lam.) Taub. 'Khankera, Tesu' Medium sized tree of open forests. Jhirniya, Jhalawar NKS 1299	Mar.-June Fls. orange red	Trop. Asia	Fls. used for dye extraction, roots for brush.
66.	<i>Dalbergia lanceolaria</i> L.f. 'Bithua' Medium sized tree, rare in forests. Aklera, Wadhwa 5382 (BSA)	Mar.-May Fls. white	Trop. Asia Australia	Wood for agricultural implements.
67.	<i>Dalbergia latifolia</i> Roxb. 'Safed Sisam' Medium sized tree, rare in forests. Jhirniya, NKS 1399 A	Mar.-Aug. Fls. pale white	Trop. Asia Australia	Timber.
68.	<i>Dalbergia paniculata</i> Roxb. 'Dobin Sisum' Medium sized tree, rare in forests. Aklera, Singh 83782 (LWG)	Mar.-May Fls. white	Trop. Asia	Timber wood, young leaves for fodder.
69.	<i>Dalbergia sericea</i> G. Don 'Sissu' Medium sized tree, rare in forests. Manoharthana OPS 347	Mar.-Aug. Fls. yellow	Trop. Asia	Timber.
70.	<i>Dalbergia sisso</i> Roxb. 'Shisham' Tall tree of deciduous forests. Lotiajhir NKS 644	Mar.-Aug. Fls. yellow	Trop. Asia	Timber for furniture.

1	2	3	4	5
71.	<i>Erythrina suberosa</i> Roxb. 'Gadhapalash' Small tree of deciduous forests. Jhirniya NKS 1456	Mar.-June Fls. bright red	Paleotropical	Bark of Medicinal value.
72.	<i>Millettia peguensis</i> Ali 'Kuranji' Small tree, occasional in deciduous forests and wastelands. Tharol, OPS 673	Aug.-Oct. Fls. purple	Paleotropical	Cultivated shade as avenue tree.
73.	<i>Ougeinia oogeinsis</i> (Roxb.) Hochr. 'Sandana' Medium sized tree, rare in wastelands. Asnawar, OPS 763	Mar.-May Fls. white	Trop. Asia	Cultivated, timber shade.
74.	<i>Pongamia pinnata</i> (L.) Pierre 'Karanj' Deciduous medium sized tree of waste lands and open places. Talai, Jhalawar NKS 1649	Mar.-June Fls. pinkish white	Trop. Asia	Cultivated as tree, seeds for oil.
75.	<i>Pterocarpus marsupium</i> Roxb. 'Bija-Sal' Deciduous tree, rare in forests. Included on authority of Agrawal (1981)	Apr.-June	Trop. Asia	Medicinal value.
76.	<i>Sesbania grandiflora</i> (L.) Poir 'Agastya' Small tree rare in forests, Raipur NKS 1165	Dec.-Mar. Fls. pink	Paleotropical	Cultivated, shade, medicine.
XXIII-CAESALPINACEAE				
77.	<i>Bauhinia purpurea</i> L. 'Kachnar' Small tree, rare in forests. Jhalawar, Wadhwa 6787	Aug.-Nov. Fls. purple	Paleotropical	Cultivated avenue tree, buds as vegetables.

1	2	3	4	5
78.	<i>Bauhinia racemosa</i> Lamk. 'Jhera, Kanchan' Small tree, common in open forests. Lotiajhir, NKS 223	May-Nov. Fls. white	Paleotropical	Bidi making timber & fuel.
79.	<i>Bauhinia variegata</i> L. 'Kachnar' Medium sized tree rare in forests. Included on authority of Gandhi (1989)	Mar.-Oct. Fls. purple	Paleotropical	Cultivated, avenue tree.
80.	<i>Cassia fistula</i> L. 'Amaltas' Medium sized tree, occasional in forests. Jhirniya NKS 279	Feb.-May Fls. purple	Trop. warm temperate	Cultivated, avenue tree.
81.	<i>Cassia siamea</i> Lamk. 'Shyama' Small tree, rare in waste places. Talai, Jhalawar NKS 1459	Feb.-July Fls. yellow	Trop. warm temperate	Cultivated, avenue tree.
82.	<i>Delonix regia</i> (Boier) Raf. 'Gulmohar' Medium sized tree with spreading crown. Kothi Prithvi Vilas, Jhalawar NKS 778	Mar.-Aug. Fls. bright red	Trop. Asia	Cultivated, avenue tree.
83.	<i>Hardwickia binata</i> Roxb. 'Anjan' Large tree with drooping branches. Rare in forests. Included on authority of Agrawal (1981)	Dec.-July Fls. yellowish	Paleotropical	Timber, wood.
84.	<i>Parkinsonia aculeata</i> L. 'Vilayati Kikar' Small tree rare in waste places.	Mar.-June Fls. bright yellow	Neotropical	Cultivated, ornamental.

1	2	3	4	5
	Tindhar, Jhalawar NKS 912			
85.	<i>Peltophorum pterocarpum</i> (DC.) Baker ex K. Heyne 'Tamaphali' Medium sized tree, with copper red pods. Mangalpura, Jhalawar NKS 1913	Apr.-Aug. Fls. bright yellow	Paleotropical	Cultivated, ornamental, avenue tree.
86.	<i>Saraca asoka</i> (Roxb.) de Wilde. 'Ashok' Medium sized evergreen tree. Madhovilas, Jhalawar NKS 2001 A	Apr.-Aug. Fls. red yellow	Indian	Cultivated, avenue tree.
87.	<i>Tamarindus indica</i> L. 'Imli' Large tree, naturalized in waste places Kothi Prithvivilas, Jhalawar NKS 810	Nov.-Apr. Fls. yellow purple	Trop. America Neotropical	Fruits edible, wood, leaves for fodder.
XXIV-MIMOSACEAE				
88.	<i>Acacia catechu</i> (L.f.) Willd. 'Khair Kattha' Small prickly tree occasional in open forests. Jhirniya NKS 1237	May-Sept. Fls. pale yellow	Paleotropical	Extraction of Kattha bark for tanning.
89.	<i>Acacia farnesiana</i> (L.) Willd. 'Babool' Small spiny tree of open places. Jhirniya NKS 425	Aug.-Mar. Fls. yellow	Neotropical	Wood bark for tanning.
90.	<i>Acacia leucophloea</i> (Roxb.) Willd. 'Ronjhan' Small tree, common in open places. Jhirniya NKS 170	Sept.-Mar. Fls. pale yellow	Paleotropical	Wood, seeds as famine food.
91.	<i>Acacia nilotica</i> (L.) Willd. ex Del.	Sept.-Mar.	Paleotropical	Wood, timber,

1	2	3	4	5
	'Babul kikar' Medium sized tree, common in open places. Jhalarpatan NKS 899	Fls. bright yellow		bark for tanning.
92.	<i>Acacia senegal</i> (L.) Willd. 'Kumta' Small tree in waste places and scrub forests. Included on authority of Gandhi (1989)	July-Feb. Fls. white or creamy	Paleotropical	Wood, seeds as famine food.
93.	<i>Albizia lebbek</i> (L.) Benth. 'Siras' Medium sized tree, common in forests and open places. Lotiajhir NKS 644	Feb.-Aug. Fls. white	Paleotropical, Australia	Cultivated, avenue tree.
94.	<i>Albizia odoratissima</i> (L.) Benth. 'Kali Siras' Medium sized tree sparse in forests. Munderi NKS 1375	Apr.-Dec. Fls. white	Paleotropical	Timber, wood shade.
95.	<i>Albizia procera</i> (Roxb.) Benth. 'Gurar' Medium sized tree sparse in forests. Pirwa, Wadhwa 6837 (BSA)	Apr.-Oct. Fls. pale white	Paleotropical	Timber wood shade.
96.	<i>Dichrostachys cinerea</i> (L.) Wt. & Arn. 'Kunali' Small tree, common in open and scrubby places. Rainbasera NKS 1322	Aug.-Oct. Fls. upper yellow lower pink	Paleotropical, Australia	Wood.
97.	<i>Leucaena latisiliqua</i> (L.) Gillis. 'Subabool'	Sept.-Mar. Fls. creamy	Neotropical	Introduced, leaves cattle

1	2	3	4	5
	Small tree introduced. Khandya villate NKS 2175			fodder, wood.
98.	<i>Pithecellobium dulce</i> (Roxb.) Benth. 'Jangal jalebi' Small tree, with spines Talai, Jhalawar NKS 586	Mar.-June Fls. pale green	Neotropical	Aril of seeds edible, shade.
99.	<i>Prosopis cineraria</i> (L.) Druce 'Khejara' Medium sized tree rare in open places. Veterinary Hospital, NKS 2176	Mar.-June Fls. yellow	Paleotropical	Pods & seeds as vegetable, gum.
100.	<i>Prosopis juliflora</i> (Sw.) DC. 'Vilayati Babool' Small, thorny tree, spreading in the area, found in open scrubby places. Govt. College NKS 726	Mar.-July Fls. greenish yellow	Neotropical	Introduced fuel.
XXV-ROSACEAE				
101.	<i>Malus pumila</i> Mill. 'Seb' A small tree, rare. Jhalawar NKS 2315	Apr.-Dec. Fls. pink	Central Asia	Rare in area cultivated in gardens.
XXVI-COMBRETACEAE				
102.	<i>Anogeissus latifolia</i> Wall. ex Guill. & Perr. 'Dhavra' Medium sized deciduous tree. Jhirniya NKS 469-A	Oct.-Feb. Fls. greenish yellow	Paleotropical	Wood fuel, cattle fodder.
103.	<i>Anogeissus pendula</i> Edgew. 'Dhok' Small gregarious tree, common in deciduous forests. Jhirniya NKS 1041	July-Nov. Fls. yellow	Paleotropical	Wood fuel, Lvs. for fodder.

1	2	3	4	5
104.	<i>Terminalia alata</i> Heyne ex Roth. 'Soj, Kohda' Large deciduous tree, common in forests. Bijliya Bhadak OPS 969	Nov.-Apr. Fls. yellow	Paleotropical	Bark of medicinal use.
105.	<i>Terminalia arjuna</i> Wt. & Arn. 'Arjun, Koha' Medium sized tree, common along ponds, rivers and streams, Jhirniya NKS 201	Apr.-Nov. Fls. white	Paleotropical	Bark of medicinal use.
106.	<i>Terminalia bellirica</i> (Gaertn.) Roxb. 'Baheda' Tall tree, occasional in forests. Rain Basera NKS 203	Feb.-Aug. Fls. yellowish green	Paleotropical	Seeds of medicinal use.
107.	<i>Terminalia catappa</i> L. 'Desi Badam' Medium sized tree. Jhalawar NKS 2207	Mar.-Aug. Fls. pale yellow	Paleotropical	Cultivated, Frs. edible, ornamental.
XXVI-MYRTACEAE				
108.	<i>Callistemon citrinus</i> (Curt.) Skeels 'Bottle brush' Small handsome tree. Rain Basera NKS 101	Mar.-May Fls. cream bright red	Australia	Cultivated, ornamental.
109.	<i>Eucalyptus rudis</i> Endl. 'Safeda' Tall tree, common in open forests. Jhalarapatan OPS 675	Dec.-Mar. Fls. white	Australia	Cultivated, wood.
110.	<i>Psidium guajava</i> L. 'Jamphal' Small tree, Rain Basera NKS 296	Oct.-Jan. Fls. white	Neotropical	Cultivated, fruits edible.
111.	<i>Syzygium cumini</i> (L.) Skeels	Mar.-Sept.	Paleotropical	Cultivated, edible

1	2	3	4	5
	'Jamun' Large tree occasional in forests. Gokulpura NKS 482	Fls. greenish white		fruits, seeds medicine.
112.	<i>Syzygium heyneanum</i> (Duthie) Wall. 'Chhota Jaman' Small tree near streams in forests, rare. Bijiliya Bhadak, OPS 794	Mar.-July Fls. pale white	Paleotropical	Edible fruits.
113.	<i>Syzygium jambos</i> (L.) Alston 'Jangli Jamun' Medium sized tree occasionally found in dense forests. Jhalarapatnan Singh 83799 (LWG)	Feb.-July Fls. greenish white	Paleotropical	Edible fruits.
XXVIII-LYTHRACEAE				
114.	<i>Lagerstroemia parviflora</i> Roxb. 'Seja' Medium sized tree, rare in forests. Manohar Thana, Verma 3463 (BSA)	Oct.-Jan. Fls. rose coloured	Paleotropical	Timber wood.
115.	<i>Lagerstroemia speciosa</i> (L.) Pers. 'Jarul' Medium sized tree, ash coloured bark. Kothi Prithvi Vilas, Jhalawar 'NKS 755	Apr.-Aug. Fls. purple	Paleotropical	Cultivated, ornamental, avenue tree.
XXIX-PUNICACEAE				
116.	<i>Punica granatum</i> L. 'Anar' Small tree dark grey bark. Khasa Radi, NKS 882	Feb.-Sept. Fls. red	Paleotropical	Cultivated for edible fruits.
XXX-CARICACEAE				
117.	<i>Carica papaya</i> L. 'Arand Kakdi' Small soft wooded tree. Jhalawar NKS 1520	Dec.-Apr. Fls. white	Neotropical	Cultivated, fruits edible.

1	2	3	4	5
XXXI-ALANGIACEAE				
118.	<i>Alangium salvifolium</i> (L.f.) Wangerin 'Ankol' Small tree, common on hill slopes. Mandawar, NKS 1409	Feb.-Apr. Fls. white	Paleotropical	Seeds of medicinal value.
XXXII-RUBIACEAE				
119.	<i>Adina cordifolia</i> Hook.f. ex Brandis 'Haldu' Large tree, occasional in forests. Khandya NKS 891	Aug.-Mar. Fls. yellow	Paleotropical	Timber wood.
120.	<i>Anthocephalus chinensis</i> (Lamk.) A. Rich. ex Walp. 'Kadamba' Large tree, rare in forests. Included on authority of Gandhi (1989)	May-Nov. Fls. orange	Paleotropical	Wood.
121.	<i>Gardenia turgida</i> Roxb. 'Gollu' Small deciduous tree, frequent in forests. Jhalawar, Verma 3486 (BSA)	Apr.-June Fls. white	Paleotropical	Wood.
122.	<i>Ixora arborea</i> Roxb. ex J.E. Sm. 'Jilpai' Small tree of shady habitats in forests. Jhalawar Wadhwa 9549 (BSA)	Jan.-Apr. Fls. white	Paleotropical	Wood.
123.	<i>Mitragyna parviflora</i> (Roxb.) Korth. 'Kalam, Kadam' Medium sized tree of deciduous forests. Jhirniya NKS 937	Aug.-Feb. Fls. greenish yellow	Paleotropical	Shade, wood.
124.	<i>Morinda tomentosa</i> Heyne ex Roth	Mar.-Dec.	Paleotropical	Shade, wood.

1	2	3	4	5
	'Aal' Small tree with 4 angled branches. Common in forests and open places. Jhalawar <i>Verma</i> 3532	Fls. white		
125.	<i>Xeromphis spinosa</i> (Thunb.) Keay 'Maniphal' Small tree in forests, hilly tracts. Jhalawar, <i>Singh</i> 83666 (LWG)	Mar.-June Fls. white	Paleotropical	Fruits edible, pulp of medicinal value.
XXXIII-SAPOTACEAE				
126.	<i>Madhuca indica</i> J.F. Gmel. 'Mahuva' Large tree common in forests. Jhirniya, <i>NKS</i> 617	Mar.-June Fls. cream coloured	Paleotropical	Fruits edible, liquor extraction.
127.	<i>Manilkara hexandra</i> (Roxb.) Dub. 'Khirni' Medium sized tree, rarely wild. SRG Hospital campus, <i>NKS</i> 1356	Oct.-Apr. Fls. white	Paleotropical	Cultivated, fruits edible.
128.	<i>Manilkara zapota</i> (L.) P. Royen. 'Cheeku' Small tree, Kothi Prithvi Vilas <i>NKS</i> 227	Dec.-Apr. Fls. white	S. America, Neotropical	Cultivated, fruits edible.
129.	<i>Mimusops elengi</i> L. 'Morsali' Small evergreen tree rare in forests. Virendra Bhawan, Jhalawar <i>NKS</i> 236	Mar.-July Fls. white	Paleotropical	Cultivated avenue tree.
XXXIV-EBENACEAE				
130.	<i>Diospyros melanoxylon</i> Roxb. 'Tendu' Small tree common in deciduous forests. Jhirniya <i>NKS</i> 712	Mar.-June Fls. white	Paleotropical	Fruits edible.

1	2	3	4	5
XXXV-SALVADORACEAE				
131.	<i>Salvadora oleoides</i> Decne. 'Pilu Jal' Small evergreen tree, on dry rocks. Gageron, NKS 1163	Feb.-June Fls. greenish white	Paleotropical	Fruits edible.
XXXVI-OLEACEAE				
132.	<i>Nyctanthes arbor-tristis</i> L. 'Harsingar' Small tree common in forests. Lotiajhir NKS 1014	Sept.-Jan. Fls. white	Paleotropical	Cultivated, ornamental value.
133.	<i>Schrebera swietenioides</i> Roxb. 'Mohka' Medium sized tree, occasional on hills. Jhalawar, Verma 3397	Feb.-May Fls. white	Paleotropical	Timber.
XXXVII-APOCYNACEAE				
134.	<i>Holarrhena pubescens</i> Wall. ex G. Don. 'Indrajo' Small tree of hilly tracts. Lotiajhir NKS 1470	May-Sept. Fls. white	Paleotropical	Fruits of medicinal value
135.	<i>Thevetia peruviana</i> (Pers.) Merr. 'Pilikaner' Small tree in gardens. Talai, Jhalawar NKS 818	May-Dec. Fls. yellow	Neotropical	Cultivated, ornamental.
136.	<i>Wrightia arborea</i> (Dennst.) Mabb. 'Kalakunda' Small tree on hilly tracts. Mandawar, Wadhwa & Prasad 9545	Dec.-Sept. Fls. creamy	Paleotropical	Wood.
137.	<i>Wrightia tinctoria</i> R.Br.	Mar.-Oct.	Paleotropical	Wood.

1	2	3	4	5
	'Dudhi' Small tree of hilly tracts. Gokulpura NKS 841	Fls. white		
138.	<i>Plumeria rubra</i> L. 'Desi-champa' Small tree of gardens. Govt. College Campus, NKS 2137 A	June-Oct. Fls. white	Neotropical	Cultivated, ornamental.
XXXVIII-ASCLEPIADACEAE				
139.	<i>Calotropis gigantea</i> (L.) R.Br. 'Safed Aankda' A small tree of open grounds. Baradari, NKS 915	Through- out the year Fls. white	Paleotropical	Cultivated, religious importance.
140.	<i>Calotropis procera</i> Ait. f. 'Aankda' Small tree of dry and waste places. Govt. College Campus, NKS 384	Throughout the year Fls. purple- white	Paleotropical	Religious value, medicinal value.
XXXIX-EHRETIACEAE				
141.	<i>Cordia dichotoma</i> Forst.f. 'Lasora' Medium sized tree, open forests. Bakani, Wadhwa 9524	Feb.-June Fls. white	Paleotropical	Fruits edible; cultivated.
142.	<i>Cordia gharaf</i> (Forssk.) Ehernb. ex Asch. 'Gundi' Medium sized tree of hilly tracts. Gageron NKS 1144	Mar.-Sept Fls. white	Paleotropical	Fruits edible, Cultivated.
143.	<i>Cordia obliqua</i> Willd. 'Lasua' Medium sized tree of forests Durgapura NKS 489	Oct.-Mar. Fls. white	Paleotropical	Fruits edible bark.
144.	<i>Ehretia aspera</i> Willd.	Mar.-May	Paleotropical	Fruits edible bark.

1	2	3	4	5
	'Tambola' Medium sized tree, common in open places. Talai, NKS 1488	Fls. white		
145.	<i>Ehretia laevis</i> Roxb. 'Tamolan' Medium sized tree, common in forests. Gindore, NKS 1308	Mar.-May Fls. white	Paleotropical	Seeds medicinal.
XL-BIGNONIACEAE				
146.	<i>Dolichandrone falcata</i> (Wall. ex DC.) Seem. 'Ghota' Small tree, on hilly tracts, rocky places. Lotiajhir NKS 1389	Mar.-June Fls. white	Paleotropical	Seeds medicinal.
147.	<i>Fernandoa adenophylla</i> Steenis 'Samei' Medium sized tree rarely along road sides. Jhalarpatan, Singh 83933 (LWG)	Mar.-June Fls. yellow brown	Paleotropical	Cultivated, ornamental.
148.	<i>Jacaranda mimosifolia</i> D. Don 'Gulturra' Small tree, frequently on road sides. Jairaj Park, Jhalawar NKS 1593 A	May-Nov. Fls. purple	Paleotropical	Cultivated, avenue tree.
149.	<i>Kigelia africana</i> (Lamk.) Benth. 'Jhadphanoos' & Balamkhira' Medium sized tree, frequent in gardens. Kothi Prithvi Vilas NKS 393	May-Nov. Fls. maroon	Paleotropical	Cultivated, avenue tree.
150.	<i>Millingtonia hortensis</i> L.f. 'Neem Chameli' Medium sized tree, common on road sides. Bhawani Club, Jhalawar NKS 2135	Sept.-Mar. Fls. white	Paleotropical	Cultivated, avenue tree.

1	2	3	4	5
151.	<i>Spathodea campanulata</i> P.Beauv. 'Pushpkumara' Medium sized tree, rare in gardens. Garh Park, Jhalawar NKS 2136	Jan.-June Fls. scarlet red	Paleotropical	Cultivated, avenue tree.
152.	<i>Stereospermum colais</i> (Buch. Ham. ex Dill.) Mabberley 'Padar' Small tree, rare in forests. Khokanda, Jhalawar NKS 2142	Feb.-Sept. Fls. purple	Paleotropical	Wood.
153.	<i>Tecomella undulata</i> (Sm.) Seem 'Rohida' Small tree, rare in area. Included on authority of Agrawal (1981)	Jan.-Apr. Fls. orange	Paleotropical	Timber.
XLI-VERBENACEAE				
154.	<i>Clerodendrum phlomidis</i> L.f. 'Arni' Small tree rare in forests. Gokulpura NKS 1046	Oct.-Jan. Fls. white	Paleotropical	Wood.
155.	<i>Tectona grandis</i> L.f. 'Sagon' Medium sized tree, common in forests. Lotiajhir NKS 12	Aug.-Dec. Fls. white	Paleotropical	Timber wood.
XLII-PROTEACEAE				
156.	<i>Grevillea robusta</i> A. Cunn ex R.Br. 'Girolia' Medium sized tree, rare on road sides. Jhalarapatan NKS 17	Mar.-July Fls. yellow	Australia	Cultivated, avenue tree.
XLIII-SANTALACEAE				

1	2	3	4	5
157.	<i>Santalum album</i> L. 'Safed Chandan' Small tree common in open forests. Raipur NKS 900	Mar.-Oct. Fls. reddish brown	Paleotropical	Wood valuable.
XLIV-EUPHORBIACEAE				
158.	<i>Breynia vitis-idaea</i> (Burm.f.) Fischer 'Jhalamol' Small tree, rare in forests. Bakani, Verma 7048 A (BSA)	Oct.-Dec. Fls. greenish yellow	Paleotropical	Wood.
159.	<i>Bridelia retusa</i> (L.) Spreng. 'Jarmala' Medium sized tree of forests. Lotiajhir NKS 342	July-Dec. Fls. creamy white	Paleotropical	Wood.
160.	<i>Euphorbia neriifolia</i> L. 'Dandathor' Small tree of rocky habitats. Bagher, NKS 1494	Mar.-July Fls. pale greenish	Paleotropical	Along boundaries for fields.
161.	<i>Mallotus philippensis</i> (Lam.) Muell.-Arg. 'Senduria' A small tree of deciduous forests. Kalisindh, Jhalawar NKS 1188	Nov.-Apr. Fls. dark red	Paleotropical	Wood.
162.	<i>Phyllanthus emblica</i> L. 'Aamla' Medium sized tree, frequent in forests. Bijliya Bhadak, NKS 916	June-Nov. Fls. greenish yellow	Paleotropical	Cultivated, fruits edible, religious importance.
163.	<i>Drypetes roxburghii</i> (Wall.) Hurusava. 'Putranja' Small tree, rare in open forests. Jhalarapatan, NKS 1476	July-Oct. Fls. yellow	Paleotropical	Cultivated, avenue tree.

1	2	3	4	5
164.	<i>Ricinus communis</i> L. 'Arand' Small tree of open and waste places. Rain basera NKS 1319	Through out the year Fls. yellow	Paleotropical	Cultivated, seeds for oil.
XLV-ULMACEAE				
165.	<i>Holoptelea integrifolia</i> (Roxb.) Planch. 'Churli' Large tree common in forests. Lotiajhir NKS 1319	Feb.-May Fls. greenish yellow	Paleotropical	Wood, shade.
XLVI-MORACEAE				
166.	<i>Ficus benghalensis</i> L. 'Bargad' Large tree common in open places. Talaj Jhalawar, NKS 1461	July-Sept. Receptacles bright red	Paleotropical	Cultivated, shade, medicine, religious, importance.
167.	<i>Ficus hispida</i> L.f. 'Katamar' Small tree of forests near water courses. Gageron NKS 1384	July-Sept. Receptacles green	Paleotropical	Fruits edible.
168.	<i>Ficus palmata</i> Forssk. sub sp. <i>virgata</i> (Roxb.) Browicz Small tree of waste places. raipur NKS 1206	Feb.-July Receptacles yellow	Paleotropical	Fruits edible.
169.	<i>Ficus racemosa</i> L. 'Gular' Small tree of forests near water courses. Lotiajhir NKS 628	Round the year, Receptacles green	Paleotropical	Fruits edible.
170.	<i>Ficus religiosa</i> L. 'Pipal' Large tree in open places. Talaj Jhalawar NKS 1460	Round the year, Receptacles red when ripe	Paleotropical	Cultivated, religious importance, shade, medicinal value.

1	2	3	4	5
171.	<i>Ficus virens</i> Dryand. 'Pakhal' Medium sized tree of open places. Mama Bhanja Jhalawar NKS 1461 A	Oct.-June Receptacles green	Paleotropical	Cultivated, for shade along road sides.
172.	<i>Morus alba</i> L. 'Shetut' Medium sized tree. Raipur NKS 1469	Mar.-June Fls. yellowish green or pink	Neotropical	Cultivated edible fruits
XLVII-CASUARINACEAE				
173.	<i>Casuarina equisetifolia</i> L. 'Jhau' Medium sized introduced tree. Gindore NKS 2149	Round the year Fls. yellow	Paleotropical	Cultivated, wood avenue tree.
XLVIII-MUSACEAE				
174.	<i>Musa paradisiaca</i> L. 'Kela' A small unbranched tree, of moist places. Jhalarapatan, NKS 2181	Round the year Fls. yellow spadix red	Paleotropical	Planted for edible fruits, religious importance.
175.	<i>Musa superba</i> L. 'Jangli Kela' Small stoloniferous tree of moist and marshy habitats. Sunoron ki Baghichi NKS 753 A	Mar.-Sept. Spadix red	Paleotropical	Pulp edible.
XLIX-ARECACEAE				
176.	<i>Phoenix sylvestris</i> (L.) Roxb. 'Khajoor' Large unbranchand tree of low lying areas. Jhalarapatan OPS 562	Feb.-Aug. Fls. yellow	Paleotropical	Fruits edible.

1	2	3	4	5
177.	<i>Caryota urens</i> L. 'Tax, Fish' tail palm' Large palm of gardens. Jhalarapatan OPS 563	Mar.-Sept. Fls. green	Paleotropical	Cultivated, ornamental.
178.	<i>Cocos nucifera</i> L. 'Nariyal' Recently introduced, rare in area. Mangalpura NKS 2178	Round the year, Fls. yellowish green	Paleotropical	Cultivated, edible fruits.
179.	<i>Royestonea regia</i> (H.B. & K.) O.F. Cooke. 'Bottle palm' Tall, unarmed, palm. Rain Basera NKS 2180	Oct.-Dec. Fls. greenish	Neotropical	Planted in gardens.
XLX-PANDANACEAE				
180.	<i>Pandanus fascicularis</i> Lamk. 'Kewda' Small tree of moist and marshy places. Jhalarapatan NKS 473	Apr.-July Fls. yellow	Paleotropical	Inflorescence for fragrance & scent.
XLXI-POACEAE				
181.	<i>Bambusa arundinacea</i> (Retz.) Roxb. 'bans' A tall thorny tree, rare in forests. Balgadh Wadhwa 5493 (BSA)	Not seen	Paleotropical	Stem in furniture.
182.	<i>Dendrocalamus strictus</i> (Roxb.) Nees Bans' Tall thorny tree in deciduous forests. Near forests Nursery NKS 1382	Oct.-Nov. (Rare) Fls. yellowish green	Paleotropical	Planted for stem.

hills. Vegetation of an area may be described as an expression of phytogeography and climate of that area. Both these factors contribute substantially in determining the vegetational distribution. Sharma and Shringi (1986) made the comparative studies about the phytogeographical elements of Jhalawar district in relation to other areas of Rajasthan. According to them, the ratio of eastern and western elements in the area comes to 1 : 1, which is self supporting to depict the floristic diversity aspect of the area. On the basis of the above fact, it is easy to understand about the presence of arid zone species *Capparis decidua*, *Leptadenia pyrotechnica* and *Prosopis cineraria* in the district along with some typical species of subtropical forests of western ghats e.g. *Mangifera indica* and *Musa superba*, plus a typical species *Adansonia digitata* (native of Tropical Africa) have been also recorded in the area under study. All these examples induce a new dimension to the floristic diversity of the area. Although last two upper storey cover species are of rare occurrence, but still sufficient to prove the cause. Surprisingly the general element predominates here also in the area under present study. The dominance of general element may be attributed to the degradation of forests, faulty pasturage cultivation and harvesting methods, the introduction of impure seeds and construction of roads and railway lines. Similarly the higher percentage of western elements in the other areas of Rajasthan may be perhaps due to increasing biotic pressures.

It is rather disgusting for ecologists and taxonomists of present times that some species which are of prime importance in representing the vegetational heritage of the area are on the verge of disappearance. Some of them are : *Adansonia digitata*, *Prosopis cineraria*, *Commiphora wightii* and *Pterocarpus marsupium* etc. alongwith several other species facing the threat of extinction from the locality. Now it is up to promising and nature loving biotechnologists of the state and nation, to come forward and to apply some effective preventive measures. For this purpose plantlets of these rare and threatened species of the area may be raised by tissue culture techniques and after attaining a suitable growth and endurance, these may successfully introduced in the forests or their natural habitats of the area. One should be hopeful that as a result of these instant and immediate rescue operations our natural heritage will be protected and preserved with an ultimate goal of the floristic diversity conservation in this part of Rajasthan.

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