

# Floristic Diversity of Abhera and Alnia Region of Kota District with Special Reference to Wetland Vegetation

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**ABSTRACT:** Floristic diversity is essential for stability of different ecosystems and proper functioning of their food chains and webs. However, floristic diversity has been diminishing at rapid pace due to increasing pace of industrialization in public and private sectors along with urbanization, population explosion and green revolution. Study on the floristic diversity of Abhera and Alnia regions in Kota (Raj.) has been studied during 2006 to 2008. Study suggests that the regions are home to a large number of species.

## I. INTRODUCTION

Floristic diversity is essential for stability of different ecosystems and proper functioning of their food chains and webs. However, floristic diversity has been diminishing at rapid pace due to increasing pace of industrialization along with urbanization, population explosion and green revolution.

### *Study Area*

Kota district is bound on the north and North West by Sawai Madhopur, Tonk and Bundi districts respectively. Chambal River separates these districts from Kota district forming the natural boundary Kota is located on a high slopping table and forming a part of Malva Plateau at 230 45' to North latitudes and 750 9' to 770' south east to north east of the town. The total area of Kota is 24156.6 square Kilometers. The average surface elevation of lord surface is 253.3 meters above M.S.L. and its shape is quadrangular

In the present study two distinct ecologically important areas were chosen which included (1) Abhera wetland and (2) Alnia wetland dam area upstream and downstream area. Panoramic view of the two sites is presented in Fig 1.

### *Abhera wetland*

The area is located near village Nanta 7 Kms. northwest from Kota city. In ancient times Abhera was a dense forest with rich wild life due to its great importance Prince Dhir Dev constructed a large pond in the year 1346. A beautiful palace and garden is also located at the eastern bank of Abhera pond has got an approximate catchment area of 100 hectares. The Abhera palace has historical importance, after renovation it is now a reputed site of tourism importance.

The site Abhera pond is approximately 120 acres in monsoon and 10 acres in summers having maximum water depth of 12 feet. This perennial fresh water wetland is manmade and till now it is unprotected. This wetland is totally rain fed and used for irrigation, fishery etc.

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Fig 1: (a) Abhera Wetland (b) Alnia Dam (Upstream)

## *Alnia wetland*

Alnia is a dam on Alnia River. It was constructed in the year 1961-62. Site area of this wetland is 500 acres in monsoon and 20 acres in summer. Average maximum water depth is 27 feet and minimum water depth is 6 feet. This unprotected, perennial, manmade reservoir is in the ownership of state government. Since it is a constructed dam, used for irrigation, it is used for fishery also. It is a very good refuge for migratory birds. Catchment area of the dam is approximately 201.43 square kilometers having average rain fall of 893.91 mm Total capacity of the tank is 45.71 million cubic meter.

## II. FLORISTIC DIVERSITY OF THE SITES

The forests of this area are of mixed deciduous type having tree species of *Aegle marmelos*, *Boswellia serrata*, *Buchnanania lanzan*, *Cassia fistula*, *Dendrocalamus strictus*, *Lagerstroemia parviflora*, *Lannea coromandelica*, *Holoptelea integrifolia*, *Butea monosperma*, *Acacia catechu*, *Wrightia tinctoria*, *Anoge sus pendula* etc.

Besides the tree species, the shrubs and under shrubs are *Calotropis procera*, *Caparis decidua*, *Mimosa hamata*, *Dichrostachys cinerea*, *Lantana camara*, *Ziziphus numularia*, *Cassia auriculata*, *Cassia occidentalis*, *Desmodium gigenticum*, *Malvestrum coromandelianum*, *Pupalia tappacea*, *Sida cordifolia*, *Triemfetta pentendra*, *Urena lobata*, *Xanthium strumarium* etc.

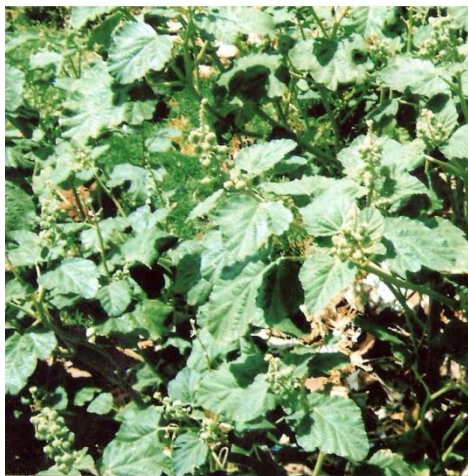
The ephemerals noticed during rainy season include *Oldenlandia Orymbosa*, *Striga eugphrasiodes*, *Zornea gibbosa*, and species of *Alysicarpus*, *Cassia*, *Crotolaria*, *Indigofera*, *Tephrosia* etc. The common associates of the above are *Aristolochia bracteolata*, *Borraria articularis*, *Cleome viscosa*, *Evolvulus alsinoides*, *Glossocardia bosvallea*, *Polygala erioptera* etc.

Annual grasses and herbs are *Dactyloctenium indicum*, *Eragrostis tenella*, *Alysicarpus monilifer*, *Indigofera cordifolia*, *Boerhavia diffusa*, *Tridax procumbans* and several grasses along with the species of *Aristida*, *Cenchrus*, *Eragrostis*, *Tragus Uroclao*, *Echinocloa* are more common.

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Besides these a large number of annual and perennial herbs were encountered in the wastelands. With the onset of winter season, considerable number of herbs like *Acalypha ciliata*, *Achyranthes aspera*, *Argemone mexicana* etc come into bloom. The most common composite herbs are *Ageratum conyzoides*, *Echinops echinatus*, *Eclipta prostrata*, *Gnephalium polycaulon*, *Laggasca mollis*, *Laggara aurita*, *Luanea procumbans*, *Sonchus oleraceous* and *sphearanthus indicus* etc.

The most common climbers' observed in the area are *Argyreia sericea*, *coculus hirsutus*, *Cryptostegia grandiflora*, *Leptadenia reticulata*, *Pergularia daemia*, *Cardiospermum helicacabum*, *Passiflora foetida*, *Cayratia carnosia*.

Xerophytic vegetation of the area includes *Acacia nilotica*, *Acacia leucophloea*, *Balanites aegyptiaca*, *Maytenus emarginatus*, *Dichrostachys cineria*, *Salvadora persica*, *Cordia dicotoma*, *Butea monosperma*, *Acacia senegal*, *Echinops echinatus*, *Xanthium strumarium*, *solanum xanthocarpum*, *Calotropis procera*, *Ziziphus numularia* etc.

Weeds growing in the areas of cultivation are *portulaca oleracea*, *Malva parviflora*, *Euphorbia thymifolia*, *Euphorbia hirta*, *medicago denticulate*, *Vicia hirsuta*, *Aanagalis arvensis*, *Lathyrus aphaca*, *Sonchus asper*, *Gomphrena celosiodes*, *celosia argentea*, *Digera muricata*, *Phyllanthus fraternus*, *Parthenium hysterophorus*, *Oxalis corniculata*, *Croton bonplandianum*, *Cassia tora*, *Tribulus terrestris* etc.

Halophytes found in the region are *Portulaca quadrifida*, *Trienthera portulacastrum* and *Tamarix dioica*.

Aquatic vegetation flourishes in rainy season. Free floating species are *Pistia stratiates*, *Utricularia stellaris*. Submerged hydrophytes are *Hydrilla verticellata*. *Potamogeton petinatus*, *Ceratophyllum desersum*. *Lemna sps.*, *Wolffia microscopica*.

Rooted emerged plants are *Nymphoides cristata*, *Nymphoides indica* *Nelumbo nucifera*, *Sagittaria sagittifolia* etc. Rooted floating hydrophytes are *Echhornia crassipes*, *Ipomea aquatica* etc.

Common marsh loving amphibians plants are *Ludwigia perennis*, *Centella asiatica*, *Polygonum glabrum* *polygonum plebeium*, *Caesula axillaris*, *Limnophilla indica*, *Hygrophilla auriculata*, *Ammania baccifera*, *Bacopa monnieri*, *Bergia ammannioides*, *Eclipta prostrata*, *Phyla nodiflora*, *Potentilla supina*, *Ranuculus scleratus* etc.

### III. SPECIES COMPOSITION OF THE WETLANDS

A systematic enumeration of aquatic and wetland angiosperms has been provided below, their botanical names are arranged alphabetically under their respective families. The families are arranged according to Bentham and Hooker's system of classification. Locality of collection has also been provided.

Family and Species	Locality
<b>Ranunculaceae</b>	
Ranunculus seeleratus linn	Abhera
<b>Nymphaeaeaeae</b>	
Nymphaea nouhali Burm. F.	Abhera
<b>Nelumbonaceae</b>	
Nelumbo nucifera Gaerth.	Abhera
<b>Caryophyllaceae</b>	
Polycarpon prostratum (Forbsk.) Asch.& schwein.	Common
Speragula arvensis sensu. Bhandari	Common
<b>Portulacaceae</b>	
Portulaca deracea Linu.	Common

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Family and Species	Locality
Portulaca quadrifida Linn.	Common
<b>Elatinaceae</b>	
Bergia ammanioides Roxb.	Abhera
<b>Malvaceae</b>	
Hibiscus lobatus Linn.	Abhera
<b>Tiliaceae</b>	
Corcherrus capsularis Linn.	Common
Corchorus tridens Linn.	Common
<b>Oxalidaceae</b>	
Oxalis corniculata Linn.	Abhera
<b>Fabaceae</b>	
Aschynomene indica Linn.	Common
Desmodium triflorum (Linn.) DC.	Common
Medicago lupulina Linn.	Common
Sesbania bispinosa (Jacq.) W.kF.whight	Alnia
Trigonella occula Delite	Common
<b>Rosaceae</b>	
Potentilla supina Linn	Common
<b>Lythraceae</b>	
Ammania baccifera Linn	Common
Ammunia multiflora Rossb.	Alnia
<b>Onagraceae</b>	
Ludwigia perennis Linn.	Common
<b>Trapaceae</b>	
Trapa natans L. var. bispinosa (Roxb.)	Abhera
<b>Aizoaceae</b>	
Trianthema portulafcastrum Linn.	Abhera
<b>Molluginaceae</b>	
Glinus lotoides Linn.	Common
Mollugo nudicaulis Linn.	Common
mallugo pentaphylla Linn.	Common
<b>Pubiaceae.</b>	
Borreria articularis (l.f.) mill	Alnia
Borraria stricta	Abhera

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Oldenlandia corymbosa Linn.	Common
<b>Asteraceae</b>	
Ageratum conyzoides Linn.	Abhera
Blumea lacera (Burn. f.) ex weight	Common
Caesulea axillaris Roxb.	Common
Eclipta prostrata Linn. Mant.	Common
Gnephalium indicum Linn.	Common
Gnephalium pulvinatum Delile	Common
Grangea modrafs palana (Linn.) Poir.	Common
Laggera aurita	Abhera
Launea nudicaulis Hook F.	Common
Sphearanthus indicus Linn.	Common
Vernonia cinerea (Linn) Less.	Abhera
Xanthium strumarium Linn.	Common
<b>Solanaceae</b>	
Nicotiana plumbazing folia Viv	Abhera
<b>Primulaceae</b>	
Anagalis arvensis Linn	Abhera
<b>Gentianaceae</b>	
Centaurium centauroioides (Roxb.) Roo & Kamathy	Abhera
Enicotema hyssopifolium (willd)	Abhera
Hoppea dichotoma Heyne	Common
<b>Menyanthaceae</b>	
Nymphoides hydrophylla (lour.) ktze	Abhera
Nymphoides indica (Linn.) ktze	Abhera
<b>Boraginaceae</b>	
Coldenia procumbens Linn.	Common
Heliotropium curassavicum Linn.	Common
Heliotropium indicum Linn.	Common
<b>Convolvulaceae</b>	
Ipomea aquatica Forsk.	Common
Ipomea carnea Jacg.	Common
Merremia emarginala (Burm.f.) Hall.	Common

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Family and Species	Locality
<b>Serophulariaceae</b>	
Bacopa monnieri (Linn.) Wettstein	Common
Dopartium junceaum (Roxb.)	Abhera
Linnophila Leterophylla (Roxb.)	Alnia
Linnophila indica (Linn) Druce.	Common
Lindernia crustacea (Linn.) F. muell.	Common
Lindernia micrantha (Blatt. Hallb.)	Common
Lindernia parviflora (Roxb.) Haines	Common
Verbascum chinense (Linn.) Sant.	Common
<b>Lentibulariaceae</b>	
Utricularia stellaris (Linn.) t.	Abhera
<b>Acanthaceae</b>	
Blepharis repens (vahl.) Roth.	Abhera
Blepharis madraspantensis (Linn) Heyne exroth	Abhera
Hemiadephis polysperme (eyne ex Roth.)	Common
Hygrophilla auriculata (Schum.) Heine	Alnia
Justicea quinqueangularis Koem.	Common
Justicea simplex D.Don.	Common
Verva sanguinolenta (Linn.) Blume.	Common
Alternanthera paronychioides Ast. Hillairre	Common
Alternanthera sessalis (Linn.) DC	Common
Amaranthus polygonoides (Rexb.)	Abhera
Digera muricala (Linn.) mart.	Abhera
<b>Chenopodiaceae</b>	
Chenopodium murale (Linn.)	Common
Polygonum barbatum (Linn.)	Common
Polygonum glabrum willd.	Common
Polygonum plebium R. Br.	Common
Rumex dentatus Linn.	Common
<b>Euphorbiaceae</b>	
Euphorbia parviflora Linn.	Common
Phylanthus virgatus J. Forst	Common

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Family and Species	Locality
<b>Ceratophyllaceae</b>	
Ceratophyllum demersum Linn.	Common
<b>Hydrocharitaceae</b>	
Hydrilla verticillata (L.f.) Royale	Common
Vallisneria Spiridis Linn.	Common
<b>Poterderiaceae</b>	
Monochoria vaginalis (Burm.) Prest.	Common
<b>Commelinaceae</b>	
Commelinabengalensis (Linn.)	Common
Cynotis cirtata (Linn.) Don.	Abhera
Murdannia veginat (Linn.) Brueck	Common
<b>Typhaceae</b>	
Typha angustata Bory & chaub (Peter)	Common
<b>Araceae</b>	
Pistia stratiotes Linn	Abhera
<b>Lemnaceae</b>	
Lemna perpusilla Torrey	Abhera
<b>Potamogetonaceae</b>	
Potamogeton cripus Linn	Abhera
<b>Frioculaceae</b>	
Eriocaulon cinerarum R. Br.	Alnia
<b>Cyperaceae</b>	
Bulboslylis barbata (Rottb) Kunth.	Abhera
Cleocharis atropurpurea Linn.	Abhera
Cperus corymbossus Rottb.	Common
Cyperus allopecuroides Rottb.	Abhera
Cyperus alulatus	Abhera
Cyperus compressus	Abhera
Cyperus cuspidatus	Abhera
Cyperus difformis	Abhera
Cyperus difformis Linn.	Common
Cyperus fuscus	Common
Cyperus michelianus s. sp pyginaeus	Common
Cyperus pumila	Common



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Family and Species	Locality
Cyperus rotundus Linn	Common
Cyperus triceps (Rott b.) Endl.	Common
Eleocharis palustris (Linn.) R. Br.	Common
Finbristytis bisumbellata (Forsk.) Bub	Common
Scirpus articulatus Linn	Common
Scirpus mucroratus	Abhera
Scirpus tuberosus	Abhera
<b>Peaceae</b>	
Brachiaria ramosa (Linn.) stapt.	Common
Cenchrus biflorus Roxb.	Common
Chloris virgatus sw. (Billi)	Common
Cynodon dactylon (Linn.) Pers	Common
Dactyloctenium aegyptium (Linn.) willd	Common
Dicanthium annulatum (Forsk.) Slapt.	Common
Echinochloa colonum (Linn.) Beavv. ex Roem.	Common
Imperata cylindrica (Linn.) Raeusched	Common
Paspalidium geminatum (Forsk) slapt.	Common
Pasplum distichum Linn.	Abhera
sporobolus diander (Refz.) P. Beauv.	Common

## IV. CONCLUSIONS

The study revealed that the region has a vast floristic diversity. Intensive farming especially irrigated cropping has changed the extent of the natural vegetation to a great deal. Much of the native trees, shrubs and grasses were cleared to make space available for cultivated crops and to supply fuel to the growing farming communities.

## V. ACKNOWLEDGEMENTS

The study presented here was conducted for award of Doctor of Philosophy to the author. Identification of species has been carried out with the assistance of “Flora of Rajasthan (South and South East Region) written by Tyagi and Aery, 2007.

## REFERENCES

1. Hemlata Gupta, 2008, “Study of Floristic Diversity and Eco-Morphological Aspects of Some wetlands of Suburban Areas of Kota”, Ph.D. Thesis, University of Kota, Kota