

Diversity of Forest Tree in the Reserve Forest of Bhupdeopur of District Raigarh, Chhattisgarh

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Abstract

The present study was conducted in Bhupdeopur Reserve forest of district Raigarh, Chhattisgarh. The study area was divided into 4 circles named as Naharpali, Kerajher, Delari and Khairpur, each circle was further divided into beats and a total of 20 beats in 16 villages were considered for the study. The study site is spread over 25 km of North West of Raigarh. Bhupdeopur reserve forest is rich in its forest resources especially dry deciduous forest trees including *Tectona grandis*, *Shorea robusta*, *Anogeissus latifolia*, *Pterocarpus marsupium*, *Terminalia tomentosa*, *Diospyros melonoxyloo*, *Madhuca indica* and *Embilica officinalis* are dominating species. In the present study an extensive survey has been conducted to find out the various types of forest flora. 80 tree species belonging to 33 families, their local name and various uses by the local inhabitant including medicinal value were recorded during the survey. The parameters such as frequency, density and abundance were also undertaken.

Keywords: Biodiversity, Forest tree, Frequency, Density and Abundance.

Introduction

India is recognized as a country rich in all aspects of Biodiversity and Ecosystem. For any country in the world it has perhaps the largest array of environmental stipulations by virtue of its tropical location, varied physical features and climate types.

Forests are one of the most easily recognizable ecosystems in the biosphere.

They contribute substantially to the economic development of the country through providing good service to people and industries. Phytosociological analysis of a plant community is an important aspect of ecological study of any piece of vegetation. Species composition is one of the important characters of plant community. Analytical character, viz., frequency, density and abundance are very useful in the comparison of two different plant communities.

Aim / Purpose

1. Identification of tree species of Bhupdeopur reserve forest.
2. To study the tree diversity of Bhupdeopur reserve forest.
3. To study the floristic composition of Bhupdeopur reserve forest.
4. Identification of endangered tree species which is of promising value.
5. To enlist ethnobotanical uses of trees specifically of health and livelihood security.

Materials and Methods

In the present study, phytosociological diversity analysis was carried out by quadrat method. Random sampling of study area was done by Quadrat method following Oosting (1958). 100 quadrats of size 30 x 30 metre were randomly laid down in the study area for the study of trees. On the basis of the data obtained from the quadrat samples, the structural distribution of forest trees were analyzed. The parameters such as % Frequency, Abundance and Density obtained during the study as suggested by Phillips (1959) and Mishra (1965), Curtis and McIntosh (1950), Curtis and Cotton (1956) were calculated from the data under as follows:

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$$\% F = \frac{\text{Number of sampling units in which plant species occurred} \times 100}{\text{Total number of sampling units studied}}$$

$$\text{Density} = \frac{\text{Total number of individuals of a plant species in all sampling units}}{\text{Total number of sampling units studied}}$$

$$\text{Abundance} = \frac{\text{Total number of individual plant species in all the sampling units}}{\text{Total number of sampling units of occurrence}}$$

Result and Discussion

Distribution and composition of plant species in Bhupdeopur Reserve forest area was analyzed by determining % frequency, density and abundance. The maximum % frequency and density was determined for the plant species *Shorea robusta* and the minimum for *Anthocophalus cadamba* while the maximum abundance was calculated for the plant species *Buchanania lanzan* and the minimum for the *Bauhinia retusa*.

The results of present study revealed that Bhupdeopur Reserve forest is rich in terms of tree species despite the disturbance like fire, grazing, extraction of medicinal plant and invasion of exotic species. In present study total of 80 tree species belonging to 66 genera of 33 families were recorded. Out of them 79 species belonged to dicotyledonae and 01 species belonged to monocotyledonae. The maximum number of tree species (18) were noted belonged to Fabaceae family, (07) of Rubiaceae family, (06) of Moraceae (05), of Combretaceae, (04) of Anacardiaceae, (03) each of Rutaceae, Apocynaceae, Meliaceae and Euphorbiaceae, (02) each of Verbenaceae, Annonaceae, Rhamnaceae and Dilleniaceae, while minimum number of species (01) was recorded for 20 of the families like Simaroubaceae, Burseraceae, Ebenaceae, Caricaceae, Lecythidaceae, Flacourtiaceae, Lythraceae, Lauraceae, Sapotaceae, Bombacaceae, Sapindaceae, Dipterocarpaceae, Sterculiaceae, Bignoniaceae, Arecaceae, Myrtaceae, Symplocaceae, Moringaceae, Punicaceae and Alangiaceae. Out of 80 trees species 65 tree species were found to be wild and 15 were noted as both wild and cultivated.

Conclusion

The distribution and phytosociological studies clearly indicate that Bhupdeopur reserve forest is an extremely important ecosystem by the virtue of richness of forest wealth and diversity of tree species with mixed dominance and favourable regeneration. However, controlled quantities of fuel wood can be removed from the forest. The species those are threatened, are rare need more attention and care.

Works Cited

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Table 1: Phytosociological Study of Trees in Bhupdeopur Reserve Forest Area of District Raigarh, Investigated during the Year 2009-2011

S.N.	Botanical Name	Local/Vernacular Name	Family	Habitat	% Frequency	Density	Abundance	Relative Frequency	Relative Density	Relative Abundance	Important Value Index
1	<i>Acacia auriculaeformis</i> A.Cunn.	Australian babool	Fabaceae	Wild/Cultivated	4	0.09	1.95	0.37	0.27	0.14	0.78
2	<i>Acacia catechu</i> (L.f.) Willd.	Khair	Fabaceae	Wild	5	0.20	2.00	0.46	0.60	0.14	1.20
3	<i>Acacia leucophloea</i> Willd.	Safedkikar	Fabaceae	Wild	7	0.14	2.20	0.65	0.42	0.16	1.23
4	<i>Acacia nilotica</i> (L.) Delile	Babool	Fabaceae	Wild	17	0.45	10.08	1.59	1.36	0.74	3.69
5	<i>Adria cordifolia</i> Benth & Hook. F.	Kalmi	Rubiaceae	Wild	10	0.18	1.95	0.93	0.54	0.14	1.61
6	<i>Aegle marmelos</i> (L.) Correa	Bel	Rutaceae	Wild	7	0.22	10.10	0.65	0.66	0.74	2.05
7	<i>Ailanthus excelsa</i> Roxb.	Bakayan	Simaroubaceae	Wild	4	0.10	0.40	0.37	0.30	0.02	0.69
8	<i>Alangium salviifolium</i> Linn. f.	Ankol	Alangiaceae	Wild	7	0.14	2.00	0.65	0.42	0.14	1.21
9	<i>Albizia lebbek</i> (L.) Benth.	Kalasis	Fabaceae	Wild	5	0.09	2.00	0.46	0.27	0.14	0.87
10	<i>Alstonia scholaris</i> (Linn.) R.Br.	Chhatawan	Apocynaceae	Wild	5	0.09	2.20	0.46	0.27	0.16	0.89
11	<i>Annona squamosa</i> Linn.	Anar	Annonaceae	Wild/Cultivated	6	0.13	12.08	0.56	0.39	0.89	1.84
12	<i>Anogeissus latifolia</i> Wall Ex. Bedd.	Dhaura	Combretaceae	Wild	25	0.85	92.26	2.34	2.58	6.81	11.73
13	<i>Anthocephalus cadamba</i> Miq.	Kadamb	Rubiaceae	Wild	2	0.03	1.25	0.18	0.09	0.09	0.36
14	<i>Artocarpus heterophyllus</i> Lam.	Kathal	Moraceae	Wild/Cultivated	3	0.04	1.75	0.28	0.12	0.12	0.52
15	<i>Azadirachta indica</i> A.Juss.	Neem	Meliaceae	Wild/Cultivated	7	0.18	2.20	0.65	0.54	0.16	1.35
16	<i>Bauhinia purpurea</i> Linn.	Koinar	Fabaceae	Wild	7	0.76	0.17	0.65	2.31	0.012	2.97
17	<i>Bauhinia retusa</i> Linn.	Madder	Fabaceae	Wild	6	0.65	0.13	0.56	1.97	0.009	2.53
18	<i>Bauhinia variegata</i> Linn.	Kachnar	Fabaceae	Wild	12	0.20	9.72	1.12	0.60	0.71	2.43
19	<i>Boswellia serrata</i> Roxb.	Salai	Burseraceae	Wild	16	0.32	25.26	1.50	0.97	1.86	4.33
20	<i>Bridelia squamosa</i> Gertm.	Kashi	Euphorbiaceae	Wild	8	0.18	2.25	0.75	0.54	0.16	1.45
21	<i>Buchanania lanzan</i> Spreng.	Char	Anacardiaceae	Wild	21	0.90	115.90	1.96	2.73	8.56	13.25
22	<i>Butea monosperma</i> (Lam.) Taub.	Palas	Fabaceae	Wild	14	0.28	3.41	1.31	0.85	0.25	2.41
23	<i>Careya arborea</i> Roxb.	Kumhi	Lecythidaceae	Wild	12	0.19	10.04	1.12	0.57	0.74	2.43
24	<i>Carica papaya</i> Linn.	Papita	Caricaceae	Wild/Cultivated	12	0.24	10.08	1.12	0.73	0.74	2.59
25	<i>Cassia fistula</i> Linn.	Amaltas	Fabaceae	Wild	14	0.30	4.85	1.31	0.91	0.35	2.57
26	<i>Chloroxylon swietenia</i> D.C.	Bhirra	Rutaceae	Wild	35	1.04	50.70	3.28	3.16	3.74	10.18
27	<i>Citrus aurantifolia</i> (Christm.) Swingle	Van Nimbu	Rutaceae	Wild	8	0.24	1.80	0.75	0.73	0.13	1.61
28	<i>Cleistanthus collinus</i> (Roxb.) Benth. & Hook. f.	Karra	Euphorbiaceae	Wild	18	0.75	12.17	1.68	2.28	0.89	4.85
29	<i>Dalbergia paniculata</i> Roxb.	Dhobin	Fabaceae	Wild	11	0.18	24.85	1.03	0.54	1.83	3.40
30	<i>Dalbergia sissoo</i> Roxb. ex DC.	Shisham	Fabaceae	Wild/Cultivated	18	0.36	12.17	1.68	1.09	0.89	3.66

31	<i>Dillenia pentagyna</i> Roxb.	Kurru	Dilleniaceae	Wild	9	0.24	12.45	0.84	0.73	0.92	2.49
32	<i>Diospyros melanoxylon</i> Roxb.	Tendu	Ebenaceae	Wild	39	2.89	22.86	3.65	8.79	1.68	14.12
33	<i>Emblica officinalis</i> Gaertn.	Amla	Euphorbiaceae	Wild/ Cultivated	9	0.18	1.65	0.84	0.54	0.12	1.5
34	<i>Ficus benghalensis</i> Linn.	Banyan	Moraceae	Wild	5	0.07	15.35	0.46	0.21	1.13	1.80
35	<i>Ficus glomerata</i> Roxb.	Gular	Moraceae	Wild	5	0.06	2.25	0.46	0.18	0.16	0.80
36	<i>Ficus heterophylla</i> Linn. f.	BhuiDumar	Moraceae	Wild	4	0.05	1.95	0.37	0.15	0.14	0.66
37	<i>Ficus racemosa</i> Linn.	Dumbahar	Moraceae	Wild	6	0.07	2.30	0.56	0.21	0.17	0.94
38	<i>Ficus religiosa</i> Linn.	Peepal	Moraceae	Wild	4	0.05	1.95	0.37	0.15	0.14	0.66
39	<i>Flacourtia ramontichi</i> L.Herit.	Kekad	Flacourtiaceae	Wild	11	0.18	8.34	1.03	0.54	0.61	2.18
40	<i>Gardenia turgida</i> Roxb.	Thanella	Rubiaceae	Wild	6	0.08	2.50	0.56	0.24	0.18	0.98
41	<i>Gmelina arborea</i> Roxb.	Gamhar	Verbenaceae	Wild	4	0.10	8.34	0.37	0.30	0.61	1.28
42	<i>Haldina cordifolia</i> Roxb.	Karam	Rubiaceae	Wild	12	0.24	9.72	1.12	0.73	0.71	2.56
43	<i>Holarrhena antidysenterica</i> (L.) Wallich ex G. Don.	Korea	Apocynaceae	Wild/ Cultivated	26	1.00	22.28	2.43	3.04	1.64	7.11
44	<i>Ixora parviflora</i> Linn.	Ladu Bahoria	Rubiaceae	Wild	8	0.11	3.25	0.75	0.33	0.24	1.32
45	<i>Lagerstromia parviflora</i> Roxb.	Senha	Lythraceae	Wild	30	0.90	35.42	2.81	2.73	2.61	8.15
46	<i>Lannea grandis</i> Dennst. Engler	Modga	Anacardiaceae	Wild	10	0.15	2.00	0.93	0.45	0.14	1.52
47	<i>Litsea glutinosa</i> (Lour.) C.B. Robbins	Maida Lakdi	Lauraceae	Wild	13	0.09	4.05	1.21	0.27	0.29	1.77
48	<i>Madhuca indica</i> J.F. Gmel.	Mahua	Sapotaceae	Wild	25	0.65	109.30	2.34	1.97	8.07	12.38
49	<i>Mangifera indica</i> Linn.	Aama	Anacardiaceae	Wild/ Cultivated	14	0.26	6.08	1.31	0.79	0.44	2.54
50	<i>Melia azadirachta</i> Linn.	Mahaneem	Meliaceae	Wild	18	0.35	10.72	1.68	1.06	0.79	3.53
51	<i>Millettia tomentosa</i> (Roxb) J.Sinciar	Kari	Annonaceae	Wild	11	0.23	8.36	1.03	0.69	0.61	2.33
52	<i>Mitragyana parviflora</i> (Roxb) Koth.		Mudhi	Rubiaceae Wild	17	0.45	6.90	1.59	1.36	0.51	3.46
53	<i>Moringa oleifera</i> Lam.	Munga	Moringaceae	Wild/ Cultivated	4	0.90	0.65	0.37	2.73	0.04	3.14
54	<i>Pelto phorum ferrugieum</i> Benth.	Jagranda	Fabaceae	Wild	5	0.16	3.20	0.46	0.48	0.23	1.17
55	<i>Phoenix aculis</i> Roxb.	Jangali Khajur	Arecaceae	Wild	7	0.30	4.28	0.65	0.91	0.31	1.87
56	<i>Pongamia pinnata</i> Pierre	Karanj	Fabaceae	Wild	13	0.22	2.75	1.21	0.66	0.20	2.07
57	<i>Psidium guajava</i> Linn.	Amrood	Myrtaceae	Wild/ Cultivated	17	0.51	8.20	1.59	1.55	0.60	3.74
58	<i>Pterocarpus marsupium</i> Roxb.	Bija	Fabaceae	Wild	23	0.62	38.91	2.15	1.88	2.87	6.90
59	<i>Punica granatum</i> Linn.	Anar	Punicaceae	Wild/ Cultivated	16	0.42	13.28	1.50	1.27	0.98	3.75
60	<i>Randia dumetorum</i> Poir	Main Phal	Rubiaceae	Wild	6	0.13	3.45	0.56	0.39	0.25	1.20
61	<i>Salmalia malabarica</i> (DC.) Schott & Ednt.	Semal	Bombacaceae	Wild	13	0.19	20.97	1.21	0.57	1.55	3.83

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62	<i>Saraca indica</i> , (Roxb.) de Willd.	Ashok	Fabaceae	Wild/ Cultivated	23	0.62	24.98	2.15	1.88	1.84	5.87
63	<i>Schleichera oleosa</i> (Lour.) Oken	Kosum	Sapindaceae	Wild	18	0.35	30.33	1.68	1.06	2.24	4.98
64	<i>Semicarpus anacardium</i> Linn.f.	Bhilwa	Anacardiaceae	Wild	16	0.54	28.88	1.50	1.64	2.13	5.27
65	<i>Sesbania grandiflora</i> (L.) Poit.	Agastya	Fabaceae	Wild	12	0.24	9.72	1.12	0.73	0.71	2.56
66	<i>Shorea robusta</i> Gaertn. f.	Sal	Dipterocarpaceae	Wild/ Cultivated	48	2.50	95.90	4.50	7.60	7.08	19.18
67	<i>Soymida febrifuga</i> A. Juss.	Rohan	Meliaceae	Wild	18	0.48	26.01	1.68	1.46	1.92	5.06
68	<i>Sterculia urens</i> Roxb.	Gulu	Sterculiaceae	Wild	8	0.15	1.60	0.75	0.45	0.11	1.31
69	<i>Stereospermum suaveolens</i> DC	Patla	Bignoniaceae	Wild	7	0.09	2.65	0.65	0.27	0.19	1.11
70	<i>Symplocos racemosa</i> Linn.	Lodh	Symplocaceae	Wild	18	0.35	10.72	1.68	1.06	0.79	3.53
71	<i>Syzygium cumini</i> (Linn.) Skeels	Jamun	Myrtaceae	Wild	21	0.50	31.51	1.96	1.52	2.32	5.80
72	<i>Tamarindus indica</i> Linn.	Imli	Fabaceae	Wild	8	0.12	24.08	0.75	0.36	1.78	2.89
73	<i>Tectona grandis</i> L. f.	Sagaun	Verbenaceae	Wild/ Cultivated	7	1.13	12.08	0.65	3.43	0.89	4.97
74	<i>Terminalia arjuna</i> (Roxb.) Weight & Arn.	Arjuna	Combretaceae	Wild	18	0.51	36.12	1.68	1.55	2.67	5.90
75	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Bahera	Combretaceae	Wild	15	0.26	30.03	1.40	0.79	2.21	4.40
76	<i>Terminalia chebula</i> (Gaertn.) Retz.	Harra	Combretaceae	Wild	16	0.25	20.25	1.50	0.76	1.49	3.75
77	<i>Terminalia tomentosa</i> Wight & Arn.	Saja	Combretaceae	Wild	44	2.05	80.05	4.12	6.23	5.91	16.26
78	<i>Thvetia peruviana</i> (Pers.) K. Schum.	Kaner	Apocynaceae	Wild	18	0.49	14.17	1.68	1.49	1.04	4.21
79	<i>Ziziphus xylopyra</i> Willd.	Ghont	Rhamnaceae	Wild	15	0.26	28.00	1.40	0.79	2.06	4.25
80	<i>Ziziphus jujube</i> Mill.	Ber	Rhamnaceae	Wild	20	0.60	24.08	1.87	1.82	1.78	5.47