



DISTRIBUTIONAL ANALYSIS OF TREE SPECIES IN BHANDARA DISTRICT (M. S.)

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ABSTRACT:

Bhandara district is well-known for the forest resources and is a continuous stretch of land with black cotton soils derived from the Deccan Trap basalt. Out of total geographical area of the district, 1217 Sq. km is under forest. The district is well decorated with moist tropical forest (Champion and Seth, 1968) type which is also known as South Indian moist deciduous forests, along the stretches of hilly terrain that provide a stable base for pastoral pursuits of the forest communities. Most of the forest area is located in the Bhandara, Tumsar, Sakoli and Pauni tahsils and teakwood is available from these forests in sizeable quantity. The other timber wood is *Bija*, *Arjun*, *Shisam*, *Haldi*, *Mohawa*, *Rohan*, *Khair*, *Char*, *Yen* and *Behada* etc. During the floristic investigation 155 tree species were studied from the district. Most of them are evenly distributed while some are found infrequent or rare in the district.

Key words :- Bhandara district, forests, tree species.

INTRODUCTION:

Forests also contribute significantly in the biological diversity of a place because there may be representative plants of a large number of species in the forests. But, when any product of the forest is produced at a commercial level, forest is called a source of it. Timber and wood are the two major products of forests. Besides, many other minor products also, like the fruits, leaves, flowers, and seeds etc. which play an important role in maintaining health of the tribal and local people. Hence, understanding of forest structure is pre-requisite to describe various ecological processes and also to model the functioning and dynamics of forest (Elouard *et al.*, 1997; Sukumar *et al.*, 1992). The aim of present study is to generate quantitative information on tree species diversity of the district.

MATERIAL AND METHODS:

In order to know the availability of tree species as wild source, the data were collected with the help of quadrat method during extensive and intensive field visits. As the area is very large, it

is not possible to count every plant, thus the area is divided into three PARTS as A, B and C, which on further divided into 3 sub-units each known as SITE-I, II & III and smaller units known as sampling units (**Table: 1**). Three types of sampling units are generally considered for studying various plant communities. These are a) Area, b) Line and c) Point. Here, the sampling units where definite area of 10m x 10m was selected known as **Quadrat**, for the quantitative analysis of the tree species in the forest areas of the district. To collect the quantitative data of tree species, ten quadrats were taken at each site. The quantitative data were arranged in tabular form and then density, frequency and abundance were calculated. Also relative values were calculated for the frequency, density and abundance and these relative values are used to calculate importance value index (IVI). During each site of quantitative analysis the location and elevation reading were taken with the help of global positioning system (GPS).

Quantitative characters are those characters that are measured, e.g. frequency, density,

abundance, importance value index (IVI) etc. of a species in a given area. These values are expressed as absolute or as relative values. The vegetation data are quantitatively analyzed for frequency, density and abundance following (Curtis & McIntosh, 1950). The relative values of frequency, density and abundance are determined following Phillips (1959). These quantitative characters of forest ecosystem in relation to tree species are given in Table: 2.

RESULT & DISCUSSION:

Plants are invaluable natural resources; they are exhaustible if overused and sustainable if the juxtaposition of present and future needs takes place within the behavioral pattern of various kinds of users. Hence it is necessary to know the availability of plant species before use. To know the tree species as wild source, quantitative aspects were studied during the course of research. This provides the information regarding the present ecological status in terms of quantitative aspects of the members of particular species in the forest flora of the district.

The most common species based on IVI are *Buchanania cochinchinensis* (Lour.) Almeida, *Cleistanthus collinus* (Roxb.) Benth. ex Hook. f., *Gardenia resinifera* Roth, *Acacia catechu* (L. f.) Willd., *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. & Perr., *Chloroxylon swietenia* DC., *Terminalia cuneata* Roth and *Terminalia elliptica* Willd. in the district.

Anogeissus acuminata (Roxb. ex DC.) Guill. & Perr., *Bauhinia semla* Wunderlin, *Crateva adansonii* ssp. *odora* (Buch.-Ham.) Jacob., *Morinda pubescens* J. E. Sm., *Sapindus emarginatus* Vahl, *Wendlandia heynei* (R. & S.) Sant. & Merch. etc. are the rare tree species in the district.

Further, Raunkiaer suggested *Law of frequency* and *Normal frequency Diagram* based on the data from his studies in all the natural ecosystems. According to law of frequency,

species poorly distributed or dispersed in an area are likely to be presented more compared to those that have better or more dispersion in an area. It is a very important quantitative parameter. Raunkiaer (1934) made an elaborate study on the frequency of species in about 8000 quadrats and based on his data, he divided species into 5 classes viz. A, B, C, D and E.

Out of total tree species studies shows, 64 species in frequency class A, 30 in class B, and rest in class C, while no tree species in Class D and E.

REFERENCES:

- Champion, H. G. and Seth, S. K. (1968). A Revised Survey of Forest types of India. Manger of Publications, Govt. of India, Delhi.
- Champion, H. G. and Seth, S. K. (1968). *A revised Survey of the Forest types of India*, Government of India Press, Nasik.
- Curtis, J.T. and McIntosh, R.P. (1950). The Interrelations of Certain Analytic and Synthetic Phytosociological Characters. *Ecology*, 31, 434-455. *American Journal of Plant Sciences*, Vol.5 No.26,
- Elouard, C., Pascal, J. P., Pelissier, R., Ramesh, B. R., Houllier, F., Durand, M., Aravajy, S., Moravie, M. A. and Gimaret-Carpentier, C. (1997). Monitoring the structure and dynamics of a dense moist evergreen forest in the western Ghats (Kodagu District, Karnataka, India). *Tropical Ecology* 38: 193-214.
- Philips, E. A. (1959). *Methods of vegetation study*, Henery Halt and Co. Inc.
- Prasad, R. and Bhatnagar, P. (1995). *Social forestry: Experiences Over the Decade*. International Book Distributors, Dehradun.
- Raunkiaer, C. (1934). The life forms of plants and statistical geography, Claredon, Oxford, 632.
- Sukumar, R., Dattaraja, H. S., Suresh, H. S., Radhakrishna, J., Vasudeva, R., Nirmala, S. R. and Joshi, N. V. (1992). Long term monitoring of vegetation in a tropical deciduous forest in Mudumalai, Southern India. *Current Science*. 62: 608-616.

Sr. No.	Name of the Part studied	Name of the Tahsil	Name of the Site	Location*	Elevation	Date of data collection
1.	PART- A	Tumsar & Mohadi	SITE-AI	(N) 21° 28.473' (E) 079° 34.728'	1056 ft.	6 th & 8 th Nov., 2010
			SITE-AII	(N)21° 30.878' (E) 079° 43.319'	1004 ft.	
			SITE-AIII	(N) 21° 31.025' (E) 079° 48.665'	953 ft.	
2.	PART-B	Bhandara, Lakhni & Sakoli	SITE-BI	(N) 21° 10.654' (E) 079° 47.807'	947 ft.	9 th & 11 th Nov., 2010
			SITE-BII	(N) 21° 01.408' (E) 079° 45.452'	960 ft.	
			SITE-BIII	(N) 21° 13.700' (E) 079° 56.856'	1004 ft.	
3.	PART- C	Pauni & Lakhandur	SITE-CI	(N) 20° 48.212' (E) 079° 36.018'	830 ft.	12 th & 14 th Nov., 2010
			SITE-CII	(N) 20° 47.712' (E) 079° 42.558'	789 ft.	
			SITE-CIII	(N) 20° 49.645' (E) 079° 51.759'	771 ft.	

Table: 1: Distribution of the study areas, location, elevation and date of data collection

Sr. No.	Name of Plant species	Importance Value Index (IVI)			
		Part- A	Part-B	Part-C	Mean
1	<i>Acacia catechu</i>	0.08	0.03	0.09	0.07
2	<i>Acacia leucophloea</i>	0.05	0.03	0.05	0.04
3	<i>Acacia nilotica ssp. indica</i>	0.06	0.05	0.03	0.05
4	<i>Aegle marmelos</i>	0.04	0.03	0.07	0.05
5	<i>Ailanthus excels</i>	0.01	0.01	0.01	0.01
6	<i>Alangium salvifolium</i>	0.07	0.03	0.03	0.04
7	<i>Albizia lebbek</i>	0.06	0.03	0.07	0.05
8	<i>Albizia odoratissima</i>	0.03	0.04	0.03	0.03
9	<i>Albizia procera</i>	0.08	0.05	0.03	0.05
10	<i>Annona squamosa</i>	0.04	0.03	0.03	0.03
11	<i>Anogeissus acuminata</i>	0.00	0.01	0.00	0.00

12	<i>Anogeissus latifolia</i>	0.07	0.07	0.07	0.07
13	<i>Antidesma ghaesembilla</i>	0.03	0.03	0.03	0.03
14	<i>Azadirachta indica</i>	0.05	0.05	0.06	0.05
15	<i>Balanites aegyptiaca</i>	0.04	0.03	0.01	0.03
16	<i>Bauhinia racemosa</i>	0.05	0.05	0.06	0.05
17	<i>Bauhinia semla</i>	0.00	0.00	0.00	0.00
18	<i>Bombax ceiba</i>	0.03	0.01	0.01	0.02
19	<i>Borassus flabellifer</i>	0.01	0.01	0.00	0.01
20	<i>Boswellia serrata</i>	0.04	0.03	0.03	0.03
21	<i>Bridelia retusa</i>	0.04	0.05	0.03	0.04
22	<i>Buchanania cochinchinensis</i>	0.11	0.07	0.10	0.09
23	<i>Butea monosperma</i>	0.07	0.05	0.06	0.06
24	<i>Careya arborea</i>	0.03	0.05	0.03	0.04
25	<i>Casearia tomentosa</i>	0.03	0.03	0.03	0.03
26	<i>Cassia fistula</i>	0.03	0.05	0.06	0.05
27	<i>Cassine glauca</i>	0.00	0.03	0.06	0.03
28	<i>Chloroxylon swietenia</i>	0.08	0.05	0.09	0.07
29	<i>Cleistanthus collinus</i>	0.09	0.08	0.09	0.09
30	<i>Clerodendrum multiflorum</i>	0.00	0.01	0.00	0.00
31	<i>Cochlospermum religiosum</i>	0.01	0.03	0.03	0.02
32	<i>Cordia dichotoma</i>	0.03	0.04	0.03	0.03
33	<i>Crateva adansonii ssp. odora</i>	0.00	0.01	0.00	0.00
34	<i>Dalbergia lanceolaria ssp. Paniculata</i>	0.04	0.05	0.03	0.04
35	<i>Dalbergia latifolia</i>	0.01	0.00	0.00	0.00
36	<i>Dillenia pentagyna</i>	0.01	0.01	0.03	0.02
37	<i>Diospyros melanoxylon</i>	0.05	0.05	0.08	0.06
38	<i>Diospyros Montana</i>	0.05	0.04	0.05	0.05

39	<i>Dolichandrone falcate</i>	0.04	0.03	0.03	0.03
40	<i>Ehretia laevis</i>	0.05	0.05	0.03	0.04
41	<i>Embelia basal</i>	0.01	0.03	0.00	0.01
42	<i>Ficus amplissima</i>	0.00	0.01	0.00	0.00
43	<i>Ficus benghalensis</i>	0.03	0.03	0.01	0.02
44	<i>Ficus hispida</i>	0.00	0.03	0.01	0.01
45	<i>Ficus mollis</i>	0.00	0.03	0.00	0.01
46	<i>Ficus racemosa</i>	0.01	0.03	0.03	0.02
47	<i>Ficus religiosa</i>	0.01	0.00	0.00	0.00
48	<i>Ficus talbotii</i>	0.00	0.01	0.02	0.01
49	<i>Flacourtia indica</i>	0.03	0.03	0.01	0.02
50	<i>Gardenia gummifera</i>	0.00	0.03	0.00	0.01
51	<i>Gardenia latifolia</i>	0.03	0.03	0.06	0.04
52	<i>Gardenia resinifera</i>	0.10	0.08	0.08	0.09
53	<i>Garuga pinnata</i>	0.03	0.04	0.03	0.03
54	<i>Glochidion zylanicum</i>	0.03	0.01	0.00	0.01
55	<i>Gmelina arborea</i>	0.05	0.05	0.05	0.05
56	<i>Grewia tiliifolia</i>	0.03	0.05	0.03	0.04
57	<i>Haldina cordifolia</i>	0.04	0.04	0.05	0.04
58	<i>Ixora pavetta</i>	0.00	0.03	0.05	0.03
59	<i>Kydia calycina</i>	0.00	0.03	0.00	0.01
60	<i>Lagerstroemia parviflora</i>	0.04	0.03	0.03	0.03
61	<i>Lannea coromandelica</i>	0.05	0.03	0.03	0.04
62	<i>Limonia acidissima</i>	0.03	0.01	0.01	0.02
63	<i>Madhuca longifolia var. latifolia</i>	0.05	0.03	0.05	0.04
64	<i>Mallotus philippensis</i>	0.01	0.03	0.01	0.02
65	<i>Mangifera indica</i>	0.00	0.01	0.00	0.00
66	<i>Manilkara hexandra</i>	0.01	0.01	0.01	0.01

67	<i>Melia azedarach</i>	0.00	0.01	0.01	0.01
68	<i>Miliusa velutina</i>	0.00	0.01	0.01	0.01
69	<i>Mitragyna parvifolia</i>	0.01	0.03	0.01	0.02
70	<i>Morinda citrifolia</i>	0.03	0.05	0.03	0.04
71	<i>Morinda pubescens</i>	0.00	0.01	0.00	0.00
72	<i>Nyctanthes arbor-tristis</i>	0.03	0.05	0.00	0.03
73	<i>Ougenia oojeinensis</i>	0.03	0.01	0.00	0.01
74	<i>Phyllanthus emblica</i>	0.07	0.05	0.08	0.07
75	<i>Pithecellobium dulce</i>	0.01	0.03	0.00	0.01
76	<i>Pongamia pinnata</i>	0.03	0.03	0.00	0.02
77	<i>Prosopis juliflora</i>	0.01	0.01	0.00	0.01
78	<i>Pterocarpus marsupium</i>	0.04	0.05	0.03	0.04
79	<i>Sapindus emarginatus</i>	0.00	0.01	0.00	0.00
80	<i>Semecarpus anacardium</i>	0.03	0.03	0.03	0.03
81	<i>Soymida febrifuga</i>	0.04	0.03	0.03	0.03
82	<i>Sterculia urens</i>	0.03	0.03	0.01	0.02
83	<i>Stereospermum chelenoides</i>	0.01	0.01	0.03	0.02
84	<i>Stereospermum colais</i>	0.00	0.03	0.00	0.01
85	<i>Syzygium cumini</i>	0.01	0.01	0.00	0.01
86	<i>Tamarindus indica</i>	0.00	0.01	0.00	0.00
87	<i>Tectona grandis</i>	0.03	0.05	0.05	0.04
88	<i>Terminalia bellirica</i>	0.03	0.03	0.05	0.04
89	<i>Terminalia chebula</i>	0.01	0.01	0.02	0.01
90	<i>Terminalia cuneata</i>	0.05	0.07	0.09	0.07
91	<i>Terminalia elliptica</i>	0.05	0.05	0.09	0.06
92	<i>Trema orientalis</i>	0.00	0.01	0.00	0.00
93	<i>Vitex negundo</i>	0.03	0.01	0.00	0.01
94	<i>Wendlandia heynei</i>	0.00	0.01	0.00	0.00

95	<i>Wrightia tinctoria</i>	0.01	0.03	0.01	0.02
96	<i>Xylia xylocarpa</i>	0.03	0.03	0.01	0.02
97	<i>Ziziphus mauritiana</i>	0.01	0.01	0.01	0.01
98	<i>Ziziphus xylopyra</i>	0.03	0.03	0.00	0.02

Table: 2. Importance Value Index (IVI) of Tree Species in PART- A, B & C.

Tree species with higher IVI in decreasing order are given in **Table: 3.**

Sr. No.	Name of the plant species	IVI			
1	<i>Buchanania cochinchinensis</i>	0.09	18	<i>Cassia fistula</i>	0.05
2	<i>Cleistanthus collinus</i>	0.09	19	<i>Diospyros Montana</i>	0.05
3	<i>Gardenia resinifera</i>	0.09	20	<i>Gmelina arborea</i>	0.05
4	<i>Acacia catechu</i>	0.07	21	<i>Acacia leucophloea</i>	0.04
5	<i>Anogeissus latifolia</i>	0.07	22	<i>Alangium salvifolium</i>	0.04
6	<i>Chloroxylon swietenia</i>	0.07	23	<i>Bridelia retusa</i>	0.04
7	<i>Phyllanthus emblica</i>	0.07	24	<i>Careya arborea</i>	0.04
8	<i>Terminalia cuneata</i>	0.07	25	<i>Dalbergia lanceolaria ssp. paniculata</i>	0.04
9	<i>Butea monosperma</i>	0.06	26	<i>Ehretia laevis</i>	0.04
10	<i>Diospyros melanoxylon</i>	0.06	27	<i>Gardenia latifolia</i>	0.04
11	<i>Terminalia elliptica</i>	0.06	28	<i>Grewia tiliifolia</i>	0.04
12	<i>Acacia nilotica ssp. indica</i>	0.05	29	<i>Haldina cordifolia</i>	0.04
13	<i>Aegle marmelos</i>	0.05	30	<i>Lannea coromandelica</i>	0.04
14	<i>Albizia lebbek</i>	0.05	31	<i>Madhuca longifolia var. latifolia</i>	0.04
15	<i>Albizia procera</i>	0.05	32	<i>Morinda citrifolia</i>	0.04
16	<i>Azadirachta indica</i>	0.05	33	<i>Pterocarpus marsupium</i>	0.04
17	<i>Bauhinia racemosa</i>	0.05	34	<i>Tectona grandis</i>	0.04
			35	<i>Terminalia bellirica</i>	0.04

Table: 3 Tree species based on IVI