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Medicinal Plants Scenario in Forest Vegetation of Baikunthpur (District-Koria) Chhattisgarh (India)

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The State of Chhattisgarh has about 44% of its geographical area covered with forests. The Koria district in Chhattisgarh lies between 22°58' to 23°49' North latitudes and 81° 33' to 82°45' East longitude. The average rainfall is 121.36 cm. The forest area is 81.23% of total district Area. The district Koria has a very rich flora exhibiting diversity especially of medicinal plants. There is no comprehensive description of the flora as well as vascular cryptogames of the district is available. Some plant species are on the verge of extinction. Keeping these points in view, the present investigation was planned. The present paper deals with diversity of the medicinal plants of the district and their ecological status. Vegetational analysis revealed some interesting observations on phytosociological characters. Shanon index of general diversity was calculated for tree shrub and herb layers. It was 4.21637 for trees, 4.6357 for shrubs and 4.8298 for herbs. A total of 108 angiospermic plant species of medicinal importance were found distributed in 46 dicot and 10 monocot families. Two medicinally important pteridophytes have also been reported.

Key words: Diversity, medicinal plants, phytosociology, Koria district.

INTRODUCTION

Koria district in Chhattisgarh is very rich in natural vegetation and biological wealth. The district lies between 22°58' to 23°49' North latitude and 81°33' to 82°45' East longitude. The average rainfall is 121.36 cm. The annual mean temperature is 24°C. The temperature varied between 16.2°C to 31°C. Geologically, the area is dominated by upper Gondwana rocks which are rich in coal deposit. The highest mountain ranges of the region occupy the northern part of the district and have a forest area of 81.23%.

The district has a sizeable tribal population using enormous range of plants for their basic needs, sustenance and livelihood. The district has very rich plant diversity, including medicinal plants. Many of them are on the verge of extinction due to over exploitation and destruction of their habitat. There has been no comprehensive study on the enumeration, distribution and the assessment of threat to the existing medicinal plants.

The vegetation particularly the forests have not been explored fully except a few reports from the forest department (Tiwari, 1992). There is no report on the rich forest flora of the district. Therefore, an attempt has been made to study the diversity of forest flora especially of medicinal plants.

MATERIALS AND METHODS

Extensive field survey was undertaken during 2005 to 2007. The floristic diversity of tropical dry deciduous forests was explored. The district comprises of five development block viz., Baikunthpur, Sonhat, Manendragarh, Khadgavan and Bharatpur. The present study was done in the Baikunthpur block of the district. The

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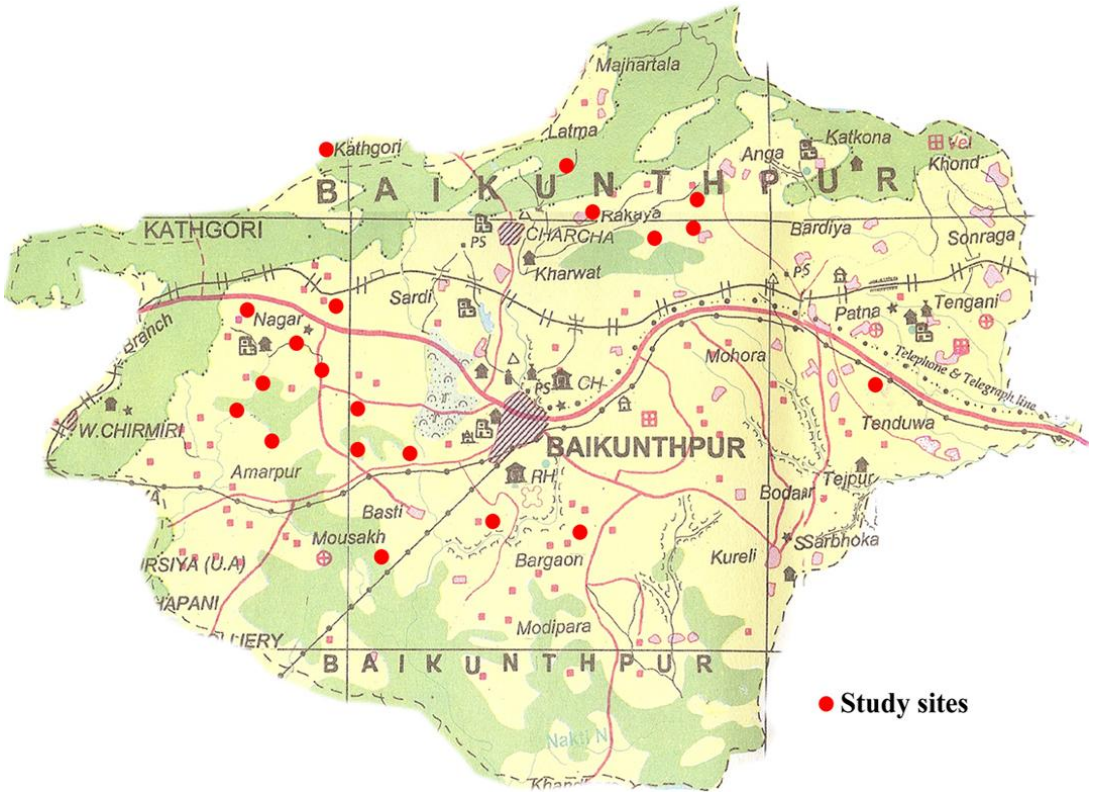

Figure 1. Baikunthpur block showing study sites.

phytosociological characters such as frequency, density and abundance were recorded as per the method described by Mishra (1968). Random quadrate sampling was done in Baikunthpur block taking 20 study site namely Shivpur, Bishunpur, Katghodi, Umghar, Nagar Pahadpara, Tilpandand, Itga, Dhudhania, Phulpur, Shankarpur, Ujiyarpur, Rakiya, Jamgahna, Jagdishpur, Kotaktall, Patrapali, Deori, Chilka and Ranai (Figure 1). The sites were widely separated from each other and cover an area of 20 to 40 km. The study sites were visited on frequent intervals and a thorough sampling was done to document the species diversity. Species diversity was calculated using the formula:

$\overline{H} = - \Sigma pi \log pi$ (Shanon and Weaver, 1963)

Where, pi is the proportion of individuals of its plant species and number of individuals of all the species.

The entire tree stands were grouped according to Girth (GBH) with an interval of 25 cm to understand the growth dynamics of the forest.

RESULTS AND DISCUSSION

Diversity

A total of 168 genera distributed in 224 species under 57 families and two pteridophytes with 3 species were also reported. Poaceae was found to be the most prominent family among monocots where as Rubiaceae and Euphorbiaceae were most prominent among the dicots (Table 1).

Phytosociological status

Quantitive vegetational analysis revealed a high degree of heterogeneity. The vegetation is Sal (*Shorea robusta*) dominated which showed cent percent occurrence in all stands. Maximum percentage frequency was also exhibited by *Randia dumetorum, Vernonia anthelminticum, Adhatoda vasica, Alangium lamarckii, Diospyros melanoxylon, Vicia sativa, Vanda roxburghai, Lawsonia inermis* and *Quisqualis indica*. These species were constantly present in the study sites.

Species showing high frequency and low abundance were attributed to a status of regular distribution and species showing low frequency and high abundance were attributed to a status of showing contagious distribution (Table 2).

Shanon index of general diversity

Shanon index was found to be 4.216 for trees, 4.635 for shrubs and 4.829 for herbs (Table 3). This clearly shows that the study area has great diversity.

The results show higher values than that of Supriya Devi and Yadav (2006) in a tropical forest of Manipur. In Indian forest H value ranged between 0.83 and 4.1 Parthasarathy et al. (1992); Singh et al. (1984); Visalakshi (1995) and Pascal (1988) reported that this ranged between 2.1

T**able. 1** Family wise account of Diversity in the Baikunthpur forest area. (only medicinal important plants.

S/N	Family	Genera	Specie
1	*Asclepiadaceae*	5	5
2	*Apocynaceae*	3	4
3	*Acanthaceae*	6	9
4	*Anacardiaceae*	5	5
5	*Amaryllidaceae*	1	1
6	*Araceae*	1	1
7	*Aracaceae*	1	2
8	*Asteraceae*	6	7
9	*Apiaceae*	1	2
10	*Bixaceae*	1	1
11	*Boraginaceae*	2	2
12	*Bignoniaceae*	3	5
13	*Bombacaceae*	1	1
14	*Combretaceae*	5	9
15	*Celastraceae*	3	3
16	*Cornaceae*	1	1
17	*Convolvulaceae*	3	3
18	*Caesalpiniaceae*	5	7
19	*Cucurbitaceae*	2	2
20	*Cactaceae*	1	1
21	*Crassuliaceae*	1	1
22	*Cyperaceae*	1	4
23	*Dipterocarpaceae*	1	1
24	*Dioscoreaceae*	1	2
25	*Euphorbiaceae*	7	10
26	*Ebenaceae*	1	1
27	*Fumariaceae*	1	1
28	*Liliaceae*	5	7
29	*Papilionaceae*	6	10
30	*Piperaceae*	1	1
31	*Poaceae*	23	27
32	*Mimosaceae*	4	6
33	*Orchidaceae*	1	2
34	*Lythraceae*	3	3
35	*Lauraceae*	2	3
36	*Lamiaceae*	5	8
37	*Moraceae*	2	4
38	*Malvaceae*	4	4
39	*Myrsinaceae*	1	2
40	*Menispermaceae*	1	1
41	*Meliaceae*	4	4
42	*Myrpaceae*	2	4
43	*Nyctaginaceae*	2	2
44	*Oxalidaceae*	1	1
45	*Plumbiginaceae*	1	2
46	*Pedaliaceae*	1	1
47	*Polypodiaceae*	**2**	**3**
48	*Rubiaceae*	7	10
49	*Rutaceae*	4	5

Table 1. Contd.

50	*Sterculiaceae*	3	3
51	*Styreceae*	1	1
52	*Scitaminaceae*	1	1
53	*Tiliaceae*	1	3
54	*Verbenaceae*	5	8
55	*Vitaceae*	1	2
56	*Zingiberaceae*	3	3
57	*Zygophyllaceae*	2	2
	Total	**168**	**224**

Table 2. Phytosociological characters of different plant species of Baikunthpur block (Dist. Koria) C.G.

S/N	Name of plant Spp.	Phytocociological character			Distribution
		Frequency (%)	Density	Abundance	
1	*Andographis paniculata, Nees*	60	27.5	45.83	R*
2	*Pluchea lanceolata,oliver & Hiern*	60	15	25	R
3	*Randia dumetorum, Lank*	100	12.5	12.5	R
4	*Embelia ribes, Burm.F.*	5	0.5	10	C*
5	*Sphaeranthus indicus, L.*	90	80	88.88	R
6	*Adiantum lanulatum, Burm.*	20	5	20	
7	*Clerodendrum serratum, L.*	60	5	8.33	R
8	*Helicteres isora, L.*	60	12.5	20.83	R
9	*Nyctanthes arbortristis, L.*	50	12.5	25	R
10	*Gardenia lucida, Roxb.*	30	2.5	8.33	R
11	*Desmodium gangeticum, DC.*	60	20	33.33	R
12	*Vicoa auricalata Cass.*	95	62.5	65.78	R
13	*Hymenodiotyon excelsum, Wall.*	50	5	10	R
14	*Bauhinia Variegata L.*	85	10	11.76	R
15	*Grewia hirsuta, Vanb.*	25	2.5	10	R
16	*Asparagus recemosus, Willd.*	60	15	25	R
17	*Vernonia anthelminticum Willd.*	100	60	60	R
18	*Erythrina indica Lamk.*	30	5	16.66	R
19	*Abelmoschus moschatus, L.*	10	2.5	25	C
20	*Ocimum basilicum L.*	95	65	68.42	R
21	*Dryopteris crenata, Christ.*	75	15	20	R
22	*Acacia concinna, DC.*	40	2.5	6.25	R
23	*Symplocos racemosa Roxb.*	60	7.5	12.5	R
24	*Sterculia urens, Roxb.*	65	10	15.38	R
25	*Bixa orellana, L.*	20	1.5	7.5	R
26	*Leucas cephalotes Spreng.*	70	20	28.57	R
27	*Crotalaria juncea L.*	70	57.14	40	R
28	*Dioscorea daemona, Roxb.*	45	7.5	16.66	R
29	*Lannea grandis Roxb.*	75	5	6.66	R
30	*Croton tiglium L.*	10	1.25	12.5	C
31	*Adhatoda vasica, Nees*	100	15	15	R
32	*Grewia rotundifolia, Juss.*	10	0.75	7.5	R
33	*Thysanolaena agrostis Nees*	80	50	62.5	R
34	*Abutilon indicum, G.Don.*	60	25	41.66	R

Table 2. Contd

35	*Oxalis corniculata L.*	70	60	85.71	C
36	*Cassia glauca, Lam.*	60	5	8.33	R
37	*Celastrus paniculata, Willd.*	10	1	10	R
38	*Clitoria ternatea, L.*	60	17.5	29.16	R
39	*Ongeinia dalbergioides Benth*	75	5	6.66	R
40	*Bauhinia vahlii, W.& A.*	85	7.5	8.8	R
41	*Cassia sophera, L.*	90	150	166.6	C
42	*Acacia catechu Willd.*	50	10	20	R
43	*Terminalia tomentosa, W. & A.*	70	7.5	10.71	R
44	*Terminalia arjuna, W. & A.*	65	5	7.69	R
45	*Centella asiatica, L.*	30	12.5	62.5	C
46	*Alangium lamarckii , Thw.*	100	35	35	R
47	*Eclipta alba, Hassk.*	85	32.5	38.23	R
48	*Vernonia cinerea, Less.*	100	65	65	R
49	*Plumbago zeylanica, L.*	35	30	42.85	C
50	*Diospyros melanoxylon, Roxb.*	100	40	40	R
51	*Gymnema sylvestre, R. Br.*	20	15	30	C
52	*Hemidesmus indicus, Br.*	60	22.5	37.5	R
53	*Pergularia extensa N.E. Br.*	75	17.5	23.33	R
54	*Cordia myxa, L.*	60	7.5	12.5	R
55	*Bryophyllum Calycinum Salis.*	40	17.5	43.75	C
56	*Boerhaavia diffusa L.*	70	10	14.28	R
57	*Ficus infectoria, L.*	70	10	14.28	R
58	*Chlorophytum tuberosum, Baker*	25	2.5	12.5	R
59	*Smilex zeylanica, L.*	40	10	25	R
60	*Hygrophila augustifolia R.Br.*	75	120	150	C
61	*Luffa aegyptiaca Mill*	40	7.5	18.75	R
62	*Cissus quadrangularis L.*	55	50	62.50%	R
63	*Woodfordia fruticosa Kurz.*	90	40	50	R
64	*Vicia Sativa L.*	100	65	65	R
65	*Spilanthes acmella L.*	30	5	25	R
66	*Pterospermum acerifolium, bWilld.*	65	5	7.69	R
67	*Blumea lacera, DC.*	95	25	26.3	R
68	*Mucuna prurita, Hook.*	45	15	30	R
69	*Sida spinosa, L*	50	25	62.5	C
70	*Tribulus terrestris L.*	65	40	66.66	C
71	*Dioscorea bulbifera L.*	65	30	50	R
72	*Psoralea corylifolia, DC.*	75	60	85.71	C
73	*Ipomea paniculata, L.*	45	10	20	R
74	*Wedelia calandulacea Less.*	80	70	87.5	C
75	*Semecarpus anacardiun L.*	40	2.5	6.25	R
76	*Phyllanthus niruri L.*	95	80	84.21	R
77	*Cyperus rotundus L.*	70	10	35.71	R
78	*Tecoma undulata, G. Don.*	5	0.25	5	R
79	*Jatropha gossypifolia L.*	80	150	187.5	C
80	*Vanda roxburghai L.*	100	200	200	C
81	*Quisqualis indica, L.*	45	7.5	16.66	R
82	*Bryonia laciniosa Mong.*	60	20	33.33	R
83	*Convolvulus pluricaulis, Chois.*	75	22.5	30	R
84	*Salmalia malabaricum, DC.*	45	30	60	C
85	*Holorrhena antidysenterica, Wall.*	90	22.50%	22.5	R
86	*Abrus precatorius L.*	60	40	66.66	C

Table 2. Contd.

87	*Acorus Calamus L.*	25	30	100	C
88	*Carissa spinarum L*	80	100	125	C
89	*Barleria cristata, L.*	50	5	10	R
90	*Martynia diandra, Glox.*	30	10	33.33	C
91	*Shorea robusta Gaertn.*	100	65	65	R
92	*Curculigo orchioides Gaertn.*	5	0.25	5	R
93	*Vitex negundo L.*	95	35	36.83	R
94	*Dalbergia latifolia Roxb.*	70	70	100	C
95	*Cuscuta reflexa Roxb.*	90	80	88.88	R
96	*Hedychium coronarium, Koenig.*	20	3	15	R
97	*Rouwolfia serpentine, Benth.*	40	10	25	R
98	*Alostonia scholaris, Brown.*	60	50	83.33	C
99	*Curcuma angustifolia, Roxb.*	40	15	37.5	R
100	*Fumaria parviflora, Lamk.*	50	40	80	C
101	*Mimosa pudica, L.*	40	50	125	C
102	*Quisqualis indica, L.*	100	120	120	C
103	*Kaempferia rotunda, L.*	50	20	40	R
104	*Cinnamomum tamala, Fr. Nees.*	50	30	60	C
105	*Jatropha curcas, L.*	90	100	111.11	C
106	*Lawsonia inermis L.*	100	150	150	C
107	*Piper longum L.*	50	35	70	C
108	*Aloe barbadensis, Mill.*	100	10	10	R
*	R = Regular Distribution				
*	C = Contagious Distribution				

Table 3. Species diversity in different layers of plant communities in Baikunthpur (Dist. - Koria) C.G.

Strata in the forest	H
Trees	4.216
Shrubs	4.635
Herbs	4.829

and 4.3 in different forest ecosystems of Western Ghats. Thakur and Khare, 2008 reported Shannon Wiever diversity index (H) ranging from 2.22 to 3.66 in forest vegetation of Sagar (M.P.).

However, the results clearly indicate a high degree of diversity and the community is a tropical dry deciduous type of Sal forest.

Presently, the medicinal plant diversity was also recorded as very high. There are plant species showing very low population density which draws attention of researchers for conservation. The sampled area requires conservation because of its potential for natural regeneration and utility value as well as varied plant diversity.

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