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RESEARCH ARTICLE

PHYTOSOCIOLOGICAL ANALYSIS OF VEGETATION OF BAIKUNTHPUR, DIST-KORIA (CHHATTISGARH) INDIA

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ABSTRACT

Koria district in Chhattisgarh lies between $22^0$58' and $23^0$51' North Latitude and $81^0$59' and $82^0$45' East Longitude and has 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. The vegetation of the district has not comprehensively described. Keeping these points in view the present investigation was planned to enumerated phytosociological analysis of vegetation of medicinal plants belonging to Baikunthpur block enumerated 140 plants. Plants having 100% frequency were *Alangium lamarckii, Diospyros melanoxylon, Lawsonia inermis, Vicia sativa* and *Shorea robusta* **.**The minimum frequency of 10% was exhibited by *Grewia tiliaefolia, Croton tiglium, Curculigo orchioides* and *Lasiosiphon eriocephalus*.
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INTRODUCTION

India contains about 8% of world's biodiversity on 2% of the earth's surface, making it one of the 12 mega diversity countries in the world. This is based on the species richness and levels of endemism recorded in a wide range of taxa of both plants and animals. Chhattisgarh, the 26th state of the country, has ample variation in physical and cultural features. It has about 44% of its total geographical area covered with forests. It enjoys hot and humid climate and gains rainfall from both north-east and south-west monsoon. Koria district in Chhattisgarh lies between $22^0$58' and $23^0$51' North Latitude and $81^0$59' and $82^0$45' East Longitude and has a forest area of 81.23%. Average rainfall is 121.36 cm. and annual mean temperature is 24^0c. The district is dominated by Upper Gondwana rocks which are rich in deposition of coal. Keeping these points in view the present investigation was planned to enumerated phytosociological analysis of vegetation of medicinal plants belonging to Baikunthpur block enumerated 140 plants .

METHODOLOGY

The work required extensive field survey and therefore a thorough and extensive survey of the five blocks of the Koria district of Chhattisgarh was done during the years 2006 to 2008.
baikunthpur block included study sites which were widely separated from each other, encompassing an area of 20 km. The sampling sites were selected randomly these are Shivpur, Katghodi, Bishunpur, Umghar, Nagar, Pahadpara, Tilpandand, Itga, Dhudhania, Phulpur, Shankarpur, Ujiyarpur, Rakiya, Jamgahna, Jagdishpur, Kotaktal, Patrapali, Deori, Chilka and Ranai. (Fig.-1). The phytosociological characters, such as, % frequency, density and abundance were also recorded as per method described by Mishra (1968).

RESULTS AND DISCUSSION

Phytosociological observations on medicinal plants belonging to Baikunthpur block enumerated 140 plants. Plants having 100% frequency were *Alangium lamarckii, Diospyros melanoxylon, Lawsonia inermis, Vicia sativa* and *Shorea robusta* The minimum frequency of 10% was exhibited by *Grewia tiliaefolia, Croton tiglium, Curculigo orchioides* and *Lasiosiphon eriocephalus.* A moderate range of frequency was exhibited by *Hymenodictyon excelsum, Vicoa auriculata, Andrographis paniculata* and *Ficus infectoria*. Maximum density and abundance was observed in case of *Vanda roxburghii* and *Cassia sophera* which was 200, 150 and 166.6 respectively. Minimum density and abundance was observed with *Curculigo orchioides* (0.25 and 5), *Cordia macleodii* (0.5 and 5) and *Tecomella undulata* (0.25 and 5) **(Table-1).** Suraj and Menon (2005) have enumerated phytosociological analysis of woody vegetation along an altitudinal gradation in Ponmudi hill, Trichur district, Kerala. They carried out vegetation analysis to study the density, basal area, IVI, dominance, diversity index and distribution pattern of species along an altitudinal gradation in Ponmudi hill of Thrissur forest division in Kerala. Negi *et al.* ,(2005) have enumerated phyto-sociological studies of a traditional reserve forest, Thal Ke Dhar, Pithoragarh, Central Himalayas (India). They have documented phytosociological study in Thal Ke Dhar Sacred forest to understand the structure, regene-ration potential and conservation status. Kharkwal *et al.* ,(2005) have described phytodiversity and growth form in relation to altitudinal gradient in the central Himalayan (Kumaun) region of India.

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Table 1 Phytosociological observation of Medicinal plants of Baikunthpur Block

S.No.	Botanical Name	Life form	Frequency %	Density	Abundance	Ecological status	Distribution R/C
1	*Abelmoschus moschatus* L.	S	10	2.5	25	Rare	C
2	*Abrus precatorius* L.	C	60	40	66.66	Often present	C
3	*Abutilon indicum* G. Don.	S	60	25	41.66	Often present	R
4	*Acacia catechu* Willd.	T	50	10	20	Often present	R
5	*Acacia concinna* DC.	T	20	2.5	6.25	Rare	R
6	*Acorus calamus* L.	H	20	30	100	Rare	C
7	*Adhatoda vasica* Nees.	S	80	15	15	Mostly present	R
8	*Adiantum lunulatum* Burm.	H	20	5	20	Rare	-
9	*Adina cordifolia* Hook.f.	T	30	1.5	5	Seldom present	R
10	*Alangium lamarckii* Thw.	T	100	35	35	Constantly present	R
11	*Aloe barbadensis* Mill.	H	100	10	10	Constantly present	R
12	*Alstonia scholaris* Brown.	T	60	50	83.33	Often present	C
13	*Amorphophallus campanulatus* Blume.	H	50	6.7	13.4	Often present	R
14	*Andrographis paniculata* Nees.	H	60	27.5	45.83	Often present	R
15	*Asparagus racemosus* Willd.	H	60	15	25	Often present	R
16	*Barleria cristata* L.	H	50	5	10	Often present	R
17	*Bauhinia purpurea* L.	S	50	6.1	12.2	Often present	R
18	*Bauhinia vahlii* W.&A.	C	60	7.5	8.8	Often present	R
19		T	60	10	11.76	Often present	R
20	*Bixa orellana* L.	T	20	1.5	7.5	Rare	R
21	*Blumea lacera* DC	H	90	25	26.3	Constantly present	R
22	*Boerhaavia diffusa* L.	H	70	10	14.28	Mostly present	R
23	*Bryonopsis laciniosa* L.	H	60	20	33.33	Often present	R
24	*Bryophyllum calycinum* Salis.	H	40	17.5	43.75	Seldom present	C
25	*Butea monosperma* Lam.	T	80	57.8	57.8	Mostly present	R
26	*Carissa spinarum* L.	S	80	100	125	Mostly present	C
27	*Cassia fistula* L.	T	40	7.7	19.25	Seldom present	R
28	*Cassia glauca* Lamk.	T	60	5	8.33	Often present	R
29	Cassia sophera L.	S	90	150	166.6	Constantly present	C
30	*Celastrus paniculata* Willd.	C	10	1	10	Rare	
31	*Centella asiatica* L.	H	30	12.5	62.5	Seldom present	C
32	*Chlorophytum tuberosum* Baker.	H	20	2.5	12.5	Rare	R
33	*Chloroxylon swietenia* DC	T	60	37.6	62.66	Often present	C
34	*Cinnamomum tamala* Fr. Nees.	T	50	30	60	Often present	C
35	*Cissus quadrangularis* L.	C	50	50	62.5	Often present	C
36	*Cleome gynandra* L.	H	90	32.7	36.33	Constantly present	R
37	*Clerodendron serratum* Spreng.	S	40	5	8.33	Seldom present	R
38	*Clitoria ternatea* L.	C	60	17.5	29.16	Often present	R
39	*Convolvulus pluricaulis* Chois.	H	70	22.5	30	Mostly present	R
40	*Cordia macleodii* Hook f. & Thoms.	T	10	0.5	5	Rare	R
41	*Cordia myxa* L.	T	60	7.5	12.5	Often present	R
42	*Crotalaria juncea* L.	H	70	57.14	40	Mostly present	R
43	*Croton tiglium* L.	T	10	1.25	12.5	Rare	C
44	*Curculigo orchioides* Gaertn.	H	10	0.25	5	Rare	R
45	*Curcuma angustifolia* Roxb.	H	40	15	37.5	Seldom present	R
46	*Cuscuta reflexa* Roxb.	H	90	60	98.88	Constantly present	C
47	*Cymbopogon martini* Stapf.	H	60	128.1	213.5	Often present	C
48	*Cyperus rotundus* L.	H	60	29.2	48.66	Often present	R
49	*Cyperus scariosus* Br.	H	70	10	35.71	Mostly present	R
50	*Dalbergia latifolia* Roxb.	T	70	70	100	Mostly present	C
51	*Desmodium gangeticum* DC	H	60	20	33.33	Often present	R
52	*Dioscorea bulbifera* L.	C	60	30	50	Often present	R
53	*Dioscorea daemona* Roxb.	C	40	7.5	16.66	Seldom present	R
54	*Diospyros melanoxylon* Roxb.	T	100	40	40	Constantly present	R
55	*Dodonaea viscosa* L.	H	50	76.6	153.2	Often present	C

56	*Dryopteris crenata* Christ.	H	70	15	20	Mostly present	R
57	*Eclipta alba* Hassk.	H	80	32.5	38.23	Constantly present	R
58	*Embelia ribes* Burm.	C	10	0.5	10	Rare	
59	*Erythrina indica* Lamk.	T	30	5	16.66	Seldom present	R
60	*Euphorbia nerrifolia* L.	S	30	5.8	11.6	Seldom present	R
61	*Euphorbia thymifolia* L.	H	60	12.6	21	Often present	R
62	*Euphorbia tirucalli* L.	S	60	26.5	44.16	Often present	R
63	*Ficus glomerata* Roxb.	T	30	2.5	8.33	Seldom present	R
64	*Ficus hispida* L.	T	60	6.7	11.16	Often present	R
65	*Ficus infectoria* Roxb.	T	50	10	14.8	Often present	R
66	*Flemingia chappar* Ham.	H	50	14.2	28.4	Often present	R
67	*Fumaria parviflor*a Lamk.	H	50	40	80	Often present	C
68	*Garcinia indica* L.	T	50	4.7	9.4	Often present	R
69	*Gardenia lucida* Roxb.	T	30	2.5	8.33	Seldom present	R
70	*Glossogyne pinnatifida* DC.	H	30	2.6	8.66	Seldom present	R
71	*Gmelina arborea* Roxb.	T	50	3.8	7.6	Often present	R
72	*Grewia hirsuta* Vanb.	S	30	2.5	10	Seldom present	R
73	*Grewia tiliaefolia* Vahl.	T	10	0.75	7.5	Rare	R
74	*Gymnema sylvestre* R.Br.	C	20	15	30	Rare	C
75	*Hedychium coronarium* Koenig.	H	20	3	15	Rare	R
76	*Helicteres isora* L.	S	60	12.5	20.83	Often present	R
77	*Hemidesmus indicus* Br.	H	60	22.5	37.5	Often present	R
78	*Holarrhena antidysenterica* Wall.	T	90	22.5	22.5	Constantly present	R
79	*Hygrophila augustifolia* R.Br.	H	70	120	150	Mostly present	C
80	*Hymenodictyon excelsum* Wall.	T	50	5	10	Often present	R
81	*Ipomoea digitata* L.	H	40	10	20	Seldom present	R
82	*Jatropha curcas* L.	S	50	100	111.11	Often present	C
83	*Jatropha gossypifolia* L.	S	80	150	187.5	Mostly present	C
84	*Jussiaea suffruticosa* L.	H	70	32.5	46.42	Mostly present	R
85	*Kaempferia rotunda* L.	H	50	20	40	Often present	R
86	*Lannea grandis* Roxb.	T	70	5	6.66	Mostly present	R
87	*Lasiosiphon eriocephalus* Decne.	S	10	1.8	1.8	Rare	C
88	*Lawsonia inermis* L.	S	100	150	150	Constantly present	C
89	*Leucas cephalotes* Spreng.	S	70	20	28.57	Mostly present	R
90	*Lippia nodiflora* Rich	H	60	32.8	54.66	Often present	R
91	*Luffa aegyptiaca* Mill.	C	40	7.5	18.75	Seldom present	R
92	*Martynia diandra* Glox.	S	30	10	33.33	Seldom present	C
93	*Mimosa pudica* L.	H	40	50	125	Seldom present	R
94	*Mucuna prurita* Hook.	C	40	15	30	Seldom present	R
95	*Murraya koenigii* Spreng.	S	30	12.7	31.75	Seldom present	C
96	*Nyctanthes arbor-tristis* L.	S	50	12.5	25	Often present	R
97	*Ocimum basilicum* L.	H	90	65	68.42	Constantly present	R
98	*Odina wodier* Roxb.	T	40	5.8	14.5	Seldom present	R
99	*Operculina turpethum* L.	C	50	17.8	35.6	Often present	R
100	*Ougeinia dalbergioides* Benth.	T	70	5	6.66	Mostly present	R
101	*Oxalis corniculata* L.	H	70	60	85.71	Mostly present	C
102	*Pandanus odoratissimus* Roxb.	S	30	3.3	11	Seldom present	R
103	*Pergularia extensa* N.E.Br.	C	70	17.5	23.33	Mostly present	R
104	*Phyllanthus niruri* L.	H	90	80	84.21	Cosntantly present	R
105	*Piper longum* L.	H	50	35	70	Often present	C
106	*Pluchea lanceolata* Oliver & Hiern	S	60	15	25	Often present	R
107	*Plumbago zeylanica* L.	H	30	30	42.85	Seldom present	C
108	*Psoralia corylifolia* DC.	H	70	60	85.71	Mostly present	C
109	*Pterospermum acerifolium* Willd.	T	60	5	7.69	Oftenpresent	R
110	*Quisqualis indica* L.	H	50	7.5	16.66	Often present	R
111	*Randia dumetorum* Lamk.	S	90	42.5	47.22	Constantly present	R
112	*Rauwolfia serpentina* Benth.	S	20	10	25	Rare	C
113	*Salmalia malabaricum* DC	T	40	30	60	Seldom present	C
114	*Semecarpus anacardium* L.	T	40	2.5	6.25	Seldom present	R

115	*Shorea robusta* Gaertn.	T	100	65	65	Constantly present	R
116	*Sida spinosa* L.	H	50	25	62.5	Often present	C
117	*Smilax zeylanica* L.	C	40	10	25	Seldom present	R
118	*Sphaeranthus indicus* L.	H	90	80	88.88	Constantly preent	R
119	*Spilanthes acmella* L.	H	30	5	25	Seldom present	R
120	*Sterculia urens* Roxb.	T	60	10	15.38	Often present	R
121	*Symplocos racemosa* Roxb.	T	60	7.5	12.5	Often present	R
122	*Tecomella undulata* Seem.	T	10	0.25	5	Rare	R
123	*Tectona grandis* L.	T	50	18.2	26	Often present	R
124	*Terminalia arjuna* W.&A.	T	50	5	7.69	Often present	R
125	*Terminalia belerica* Roxb.	T	30	5.3	17.66	Seldom present	R
126	*Terminalia chebula* Retz.	T	20	3.7	18.5	Rare	R
127	*Terminalia tomentosa* W.&A.	T	70	7.5	10.71	Mostly present	R
128	*Thysanolaena agrostis* Nees.	H	80	50	62.5	Mostly present	R
129	*Tinospora cordifolia* Miers.	C	60	15.7	26.16	Often present	R
130	*Tribulus terrestris* L.	H	60	40	66.66	Often present	C
131	*Triumfetta rhomboidea* Jacq.	H	50	36.9	73.8	Often present	C
132	*Vanda roxburghii* Br.	H	100	200	200	Constantly present	C
133	*Vernonia anthelminticum* Willd.	H	80	60	60	Mostly present	R
134	*Vernonia cinerea* Less.	H	90	65	65	Constantly present	R
135	*Vicia sativa* L.	C	100	65	65	Constantly present	R
136	*Vicoa auriculata* Cass.	H	50	22.8	45.6	Often present	R
137	*Vitex negundo* L.	T	90	35	36.83	Constantly present	R
138	*Wedelia calendulacea* Less.	H	80	70	87.5	Mostly present	C
139	*Woodfordia fruticosa* Kurz.	S	90	40	50	Constantly present	R
140	*Xanthium strumarium* L.	H	30	14.7	49	Seldom present	C

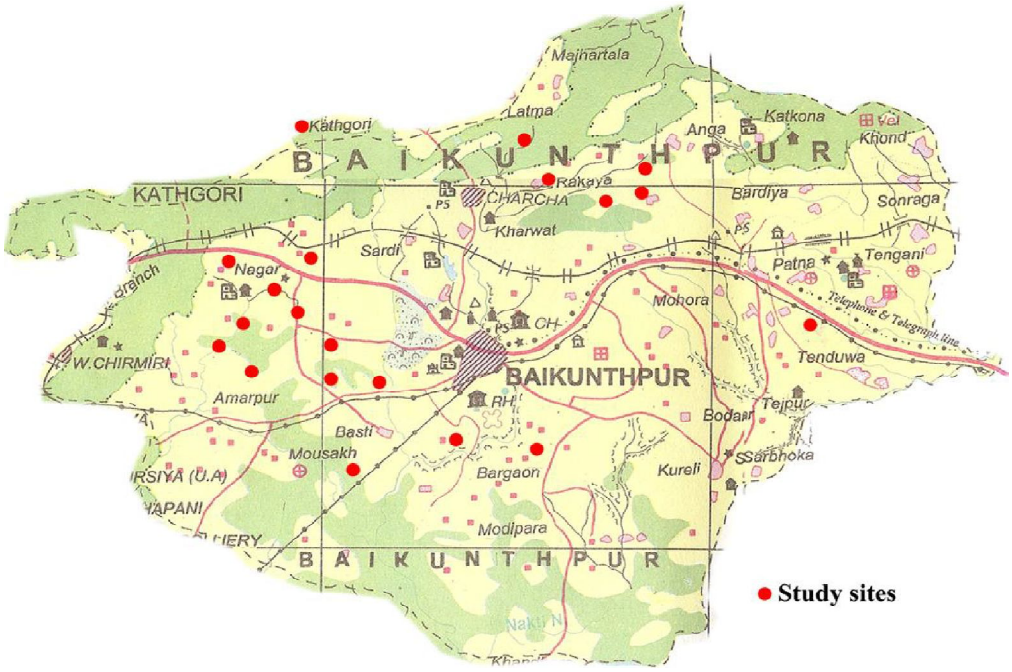

Figure 1 Baikunthpur block showing study sites

They noted that a total of 2487 species were recorded, of which, 276 were trees, 355 shrubs, 112 climbers and 1744 herbs. The study concludes that the distri-bution and species richness pattern in this region largely depends on the altitude and climatic variables like largely depends on the altitude and climatic variables like rainfall, temperature etc.

Kumar *et al.*, (2006) have analysed phytosociological characteristics and diversity patterns of tropical forest tree species in Garo hills, western Meghalaya, North-east India. Awasthi *et al.* ,(2007) have studied floral diversity of Bandhavgarh National Park with a phytosociological approach. They explored the value of wildlife habitats for wildlife species which is directly linked to the type and variety of plant communities and their conditions. Various phytosociological characteristics like species

composition, species diversity and similarity have also been analysed. Bijalwan *et al.* ,(2009) have done phytosociological analysis of overstorey and understorey woody perennials alongwith aspects in Balandi watershed of mixed dry tropical forest in Chhattisgarh plain. They concluded that aspect plays an important role in the structure and dominance in the phytodiversity.

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