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Phytodiversity of Vegetation of Khadgawan Block, Dist-Koria (Chhattisgarh) India

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Abstract

The district Koria has a very rich flora exhibiting diversity specially of medicinal plants. There is no comprehensive description of
the flora of the district is available . The district has a tribal population using enormous range of plants for their basic needs, sustenance and livelihood.
Keeping these points in view the Present paper deals with diversity of the medicinal plants of the district and their ecological status. Vegetational analysis of Khadgawan block revealed some interesting observations on phytosociological characters enumerate 94 medicinal plants were recorded. The common plant species showing maximum frequency were *Tribulus terrestris* (90%), *Vicia sativa* (80%) and *Jatropha curcas*, *Cleome gynandra* and *Blumea lacera* (70%).
Population-wise *Cleome gynandra* and *Vicia sativa* were high showing maximum density of 66.6 and 66.3 respectively. *Cleome gynandra* was most abundantly found. Other abundantly found species at Khadgawan were *Thysanolaena agrostis* and *Cymbopogon martini*. At this site, *Caesalpinia bonducella, Hemidesmus indicus, Mimosa pudica, Salmalia malabaricum* were the plants which showed minimum frequency values of only 20%.
Minimum density and abundance was exhibited by *Leucas cephalotes, Dioscorea bulbifera* and *Salmalia malabaricum* . *Acorus calamus, Caesalpinia bonducella, Amomum subulatum* and *Hemidesmus indicus* were the rare species at this site.

Keywords: Phytosociology, Khadgawan, Vegetation, % Frequency.

Contents

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1. 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 is very rich in natural vegetation and biological wealth. The district lies between $22^0$58' to $23^0$49' North latitude and $81^0$33' to $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. The vegetation particularly the forests have not been explored fully excepting a few reports from the forest department Tiwari Pranesh [1] There is no report on the rich forest flora of the district. Keeping these points in view the present investigation was planned to enumerated phytosociological analysis of vegetation of medicinal plants belonging to Khadgawan block.

2. Materials and Methods

Extensive field survey was undertaken during 2006 to 2008.The phytodiversity of tropical dry deciduous forests was explored. The district comprises 5 development block, namely, Baikunthpur,Sonhat, Manendragarh, Khadgavan and Bharatpur. This study was done in the Khadgawan block of the district.

Khadgawan block included study sites which were widely separated from each other, encompassing an area of 30 km^2. Study sites were visited of frequent intervals and a thorough sampling was done to document the species diversity. The plant specimens were preserved, identified and a herbarium has been prepared. Identification of medicinal plants species was primarily done by gathering local information regarding availability and utilization of various wild medicinally important plants.

The sampling sites were selected randomly these are Podidih, Peeparbahra, jilda, Duggi, Kadambahra, Podi, Bachra, Bardar, Chopan, Bharda, Pendari, Mangora, Kodangi, and Kanharbahra. (Fig-1)

The phytosociological characters, such as, % frequency, density and abundance were also recorded as per method described by Mishra [2].

3. Results & Discussion

Phytosociological observations on medicinal plants belonging to Khadgawan block enumerated , 94 medicinal plants were recorded. the common plant species showing maximum frequency were *Tribulus terrestris* (90%), *Vicia sativa* (80%) and *Jatropha curcas*, *Cleome gynandra* and *Blumea lacera* (70%).

Population-wise *Cleome gynandra* and *Vicia sativa* were high showing maximum density of 66.6 and 66.3 respectively. *Cleome gynandra* was most abundantly found. Other abundantly found species at Khadgawan were *Thysanolaena agrostis* and *Cymbopogon martini*. At this site, *Caesalpinia bonducella, Hemidesmus indicus, Mimosa pudica, Salmalia malabaricum* were the plants which showed minimum frequency values of only 20%.

Minimum density and abundance was exhibited by *Leucas cephalotes, Dioscorea bulbifera* and *Salmalia malabaricum* . *Acorus calamus, Caesalpinia bonducella, Amomum subulatum* and *Hemidesmus indicus* were the rare species at this site. (Table-1).

However, the results clearly indicate a high degree of diversity and the community is a tropical dry deciduous type of Sal forest. Negi and Sunil [3] 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. [3]

Kharkwal Geeta, et al. [4] have described phytodiversity and growth form in relation to altitudinal gradient in the central Himalayan (Kumaun) region of India. 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. [4]

Kumar Ashish, et al. [5] have analysed phytosociological characteristics and diversity patterns of tropical forest tree species in Garo hills, western Meghalaya, North-east India. Kumar Ashish, et al. [5]

Thakur and Khare [6] have reported *Tectona grandis* as dominant tree species in forest vegetation of Sagar district on the basis of I.V.I. In present study, analysis has been done especially emphasizing medicinal plants [6].

Pokhariyal, et al. [7] have analysed the comparative studies on species richness, diversity and composition of *Anogeissus latifolius* mixed forest in Phakot and Pathari Rao watersheds of Garhwal Himalyas. They have compared the tree species richness in the two watersheds and revealed that distribution and species richness pattern in Phakot and Pathari Rao watersheds were more or less similar. A total of 87 spp. [7].

Shameem and Kangroo [8] have studied to investigate the comparative assessment of edaphic factors and phytodiversity of herbaceous vegetation on seasonal basis spring (March to May), summer (June to August), autumn (September to November) and winter (December to February), at two different ecosystems in lower Dachigam National Park, Kashmir Himalaya.[8].

Shaheen Hamayun and Shinwari Zabta [9] They have Studied that Hindukush Himalayas (HKH) is one of the world's richest biodiversity region hosting 4 global biodiversity hotspots, 60 ecoregions and 488 protected areas. [9].

4. Conclusion

The result in the present study clearly show that the flora is very rich floristically which may be attributed to its varied topography and variation in climatic conditions. 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-1. Phytosociological Observation of medicinal plants of KHADGAWAN Block

S.No.	Botanical Name	Life form	%Frequency	Density	Abundance	Ecological status
						Distribution R/C
1.	*Acorus calamus* L.	H	20	3.7	18.5	Rare R
2.	*Alangium lamarckii* Thw.	T	60	13.2	22	Often R
3.	*Alstonia scholaris* Brown.	T	30	2.5	8.33	Seldom R
4.	*Amomum subulatum* Roxb.	S	20	3.1	15.5	Rare R
5.	*Amorphophallus campanulatus* Roxb.	H	20	3.4	17	Rare R
6.	*Anamirta cocculus* W.&.A.	C	50	6.4	12.8	Often R
7.	*Artemisia maritima* Linn.	H	60	15.1	25.16	Often R
8.	*Barleria cristata* L.	H	40	15.3	30.6	Seldom R
9.	*Bauhinia purpurea* L.	S	60	12.4	20.66	Often R
10.	*Bauhinia variegata* L.	T	30	3.2	10.66	Seldom R
11.	*Blumea lacera* DC.	H	70	26.3	37.57	Mostly R
12.	*Bryophyllum calycinum* Salis.	H	50	29.1	58.2	Often C
13.	*Buchanania lanzan* Spreng.	T	20	3.5	17.5	Rare R
14.	*Butea monosperma* Lamk.	T	40	16.9	42.25	Seldom C
15.	*Caesalpinia bonducella* Flem.	S	20	7.5	37.5	Rare C
16.	*Canna indica* L.	H	40	5.4	13.5	Seldom R
17.	*Cannabis corniculata* L.	S	40	8.5	14.16	Seldom R
18.	*Carissa spinarum* L.	S	30	33.5	41.87	Seldom C
19.	*Cassia fistula* L.	T	50	10.5	26.25	Often R
20.	*Cassia sophera* L.	S	50	4.3	8.6	Often R
21.	*Centella asiatica* L.	H	50	21.9	36.5	Often R
22.	*Chloroxylon swietenia* DC.	T	50	25.9	51.8	Often C
23.	*Cleome gynandra* L.	H	70	66.6	95.14	Mostly C
24.	*Clitoria ternatea* L.	C	20	3.3	16.5	Rare R
25.	*Cochlospermum religiosum* DC.	T	30	5.4	18	Seldom R
26.	*Colebrookia oppositifolia* Smith	T	50	6.3	12.6	Often R
27.	*Coleus aromaticus* Roxb.	H	30	10.4	34.66	Seldom C
28.	*Corchorus trilocularis* L.	S	40	13.9	34.75	Seldom R
29.	*Cryptolepsis buchanani* Roem.	S	40	7.7	19.25	Seldom R
30.	*Curcuma angustifolia* Roxb.	H	50	11.1	22.2	Often R
31.	*Curcuma aromatica* Salisb.	H	40	23.5	58.75	Seldom C
32.	*Cuscuta reflexa* Roxb.	H	20	7.7	38.5	Rare C
33.	*Cymbopogon martini* Stapf.	H	40	45.6	114	Seldom C
34.	*Cyperus rotundus* L.	H	50	29.8	59.6	Often C
35.	*Cyperus scariosus* Br.	H	60	44.5	74.16	Often C
36.	*Dalbergia latifolia* Roxb.	T	50	12.1	24.2	Often R
37.	*Dioscorea bulbifera* L.	C	30	2.3	7.66	Seldom R
38.	*Diospyros melanoxylon* Roxb.	T	40	34.4	43	Seldom C
39.	*Dodonaea viscosa* L.	H	50	33.5	67	Often C
40.	*Dryopteris crenata* Christ.	H	30	6	20	Seldom R
41.	*Eclipta alba* Hassk.	H	60	20.4	34	Often R
42.	*Euphorbia neriifolia* L.	S	50	13.2	26.4	Often R
43.	*Euphorbia tirucalli* L.	S	60	18.3	30.5	Often R
44.	*Flemingia nana* Roxb.	H	40	5.5	13.75	Seldom R
45.	*Garcinia indica* L.	T	50	6.2	12.4	Often R
46.	*Helicteres isora* L.	S	40	7.8	19.5	Seldom R
47.	*Hemidesmus indicus* Br.	H	20	3.3	11	Rare R
48.	*Holoptelea integrifolia* Planch.	T	60	7.2	12	Often R
49.	*Hygrophila augustifolia* R.Br.	H	60	24.3	40.5	Often R
50.	*Hyptis suaveolens* Poit	S	30	13	43.33	Seldom C

Continue

51.	*Ipomoea mauritiana* Lam.	H	40	16.9	42.25	Seldom	C
52.	*Jatropha curcas* L.	S	70	35	50	Mostly	R
53.	*Jatropha gossypifolia* L.	S	50	17.4	34.8	Often	R
54.	*Jussiaea suffruticosa* L.	H	50	26.2	52.4	Often	C
55.	*Lawsonia inermis* L.	S	60	48.2	80.33	Often	C
56.	*Leucas cephalotes* Spreng.	S	30	1	10	Seldom	R
57.	*Luffa aegyptiaca* Mill.	C	70	8.4	12	Mostly	R
58.	*Melia azedarach* L.	T	30	3.7	12.33	Seldom	R
59.	*Mimosa pudica* L.	H	20	7.2	36	Rare	C
60.	*Murraya koenigii* Spreng.	S	60	25.5	42.5	Often	R
62.	*Ocimum basilicum* L.	H	60	32.6	54.33	Often	R
63.	*Ougeinia dalbergioides* Benth.	T	50	8.1	16.2	Often	R
64.	*Oxystelma esculentum* Br.	H	30	7	35	Seldom	C
65.	*Pedalium murex* L.	S	50	13.1	26.2	Often	R
66.	*Phyllanthus niruri* L.	H	40	18.7	46.75	Seldom	C
67.	*Picrorhiza kurroa* Benth.	H	60	28.7	47.83	Often	R
68.	*Piper longum* L.	H	40	6	15	Seldom	R
69.	*Pterospermum acerifolium* Willd.	T	30	2.3	7.66	Seldom	R
70.	*Pueraria tuberosa* DC.	C	30	2.7	9	Seldom	R
71.	*Quisqualis indica* L.	H	40	26.3	65.75	Seldom	C
72.	*Randia dumetorum* Lamk.	S	30	8.7	29	Seldom	R
73.	*Salmalia malabaricum* DC.	T	20	1.5	7.5	Rare	R
74.	*Shorea robusta* L.	T	50	34.1	68.2	Often	C
75.	*Smilax zeylanica* L.	C	30	5.4	13.5	Seldom	R
76.	*Sphaeranthus indicus* L.	H	40	8.4	21	Seldom	R
77.	*Spilanthes acmella* L.	H	20	3	15	Rare	R
78.	*Stevia rebaudiana* Bertoni.	H	30	6.2	20.66	Seldom	R
79.	*Tectona grandis* L.	T	30	3.1	10.33	Seldom	R
80.	*Terminalia arjuna* W.&A.	T	30	10	6.66	Seldom	R
81.	*Terminalia belerica* Roxb.	T	30	4.5	15	Seldom	R
82.	*Thalictrum foliolosum* DC.	H	40	10	25	Seldom	R
83.	*Thysanolaena agrostis* Nees.	H	40	55.4	138.5	Seldom	C
84.	*Tribulus terrestris* L.	H	90	46.4	51.55	Constantly	R
85.	*Triumfetta rhomboidea* Jacq.	H	60	21.4	35.66	Often	R
86.	*Vernonia anthelminticum* Willd.	H	50	22	44	Often	R
87.	*Vernonia cinerea* Less.	H	50	24.7	49.4	Often	R
88.	*Vicia sativa* L.	C	80	66.3	82.87	Mostly	C
89.	*Vicoa auriculata* Cass.	H	50	23.2	46.4	Often	R
90.	*Vitex negundo* L.	T	40	5.5	13.75	Seldom	R
91.	*Wedelia calendulacea* Less.	H	20	7.1	35.5	Rare	C
92.	*Woodfordia fruticosa* Kurz.	S	60	33.1	47.28	Often	R
93.	*Xanthium strumarium* L.	H	30	14	46.66	Seldom	C
94.	*Zizyphus xylopyra* Willd.	T	30	9.7	32.33	Seldom	C

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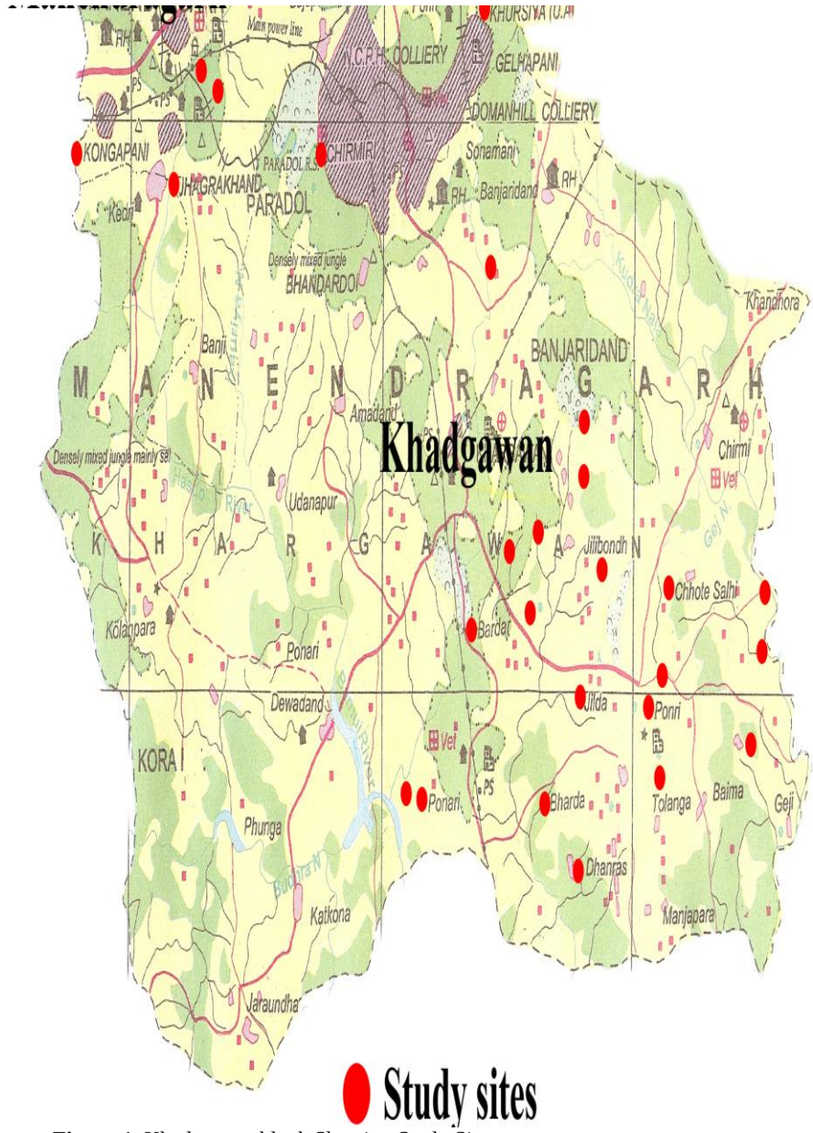

Figure-1. Khadgawan block Showing Study Sites