



## COMPOSITION OF FOREST VEGETATION OF KORIA DISTRICT, CHHATTISGARH (INDIA)

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### Abstract

The State of Chhattisgarh has about 44% of its geographical Area Covered with forests. Korlia district in Chhattisgarh lies between 22<sup>0</sup>58' and 23<sup>0</sup>51' North Latitude and 81<sup>0</sup>59' and 82<sup>0</sup>45' East Longitude and has a forest area of 81.23%. Average rainfall is 121.36 cm. and annual mean temperature is 24<sup>0</sup>c. The district has very rich plant diversity, including medicinal plants. The vegetation of the district has not been comprehensively 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 investigation was planned to enumerate phytosociological behaviour of the vegetation of the district. Present paper deal with final abstraction of phytosociological behaviour in the form of their Importance Value Indices revealed that maximum IVI were exhibited by *Woodfordia fruticosa* (28.65), *Shorea robusta* (23.25), *Dodonaea viscosa*, *Albizia odoratissima* and *Lawsonia inermis* ranked second in the range of 16.99 to 17.87 and *Butea monosperma*, *Corchorus trilocularis*, *Vanda roxburghii* and *Cymbopogon martini* were third ranking species, so far as the IVI is concerned Species showing very low IVI were *Leea macrophylla* (0.148), *Lasiosiphon eriocephalus* (0.641), *Curculigo orchioides* (0.1052), *Embelia ribes* (0.1131), *Cordia macleodii* (0.1586), *Grewia tiliaefolia* (0.2247), *Rauwolfia serpentina* (0.2365), *Celastrus paniculata* (0.2363), *Manihot glaziovii* (0.3499), *Abelmoschus moschatus* (0.3932) and *Hedychium coronarium* (0.4385), *Grewia hirsuta* (0.6044), *Tecomella undulata* (0.6695), *Chlorophytum tuberosum* (0.6992), *Gymnema sylvestre* (0.9452), *Acacia concinna* (0.9719) and *Prosopis spicigera* (0.9784).

**Keywords:** - Korlia district, phytosociology, vegetation, Importance Value Index.

### 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 26<sup>th</sup> 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.

Korlia district in Chhattisgarh lies between 22<sup>0</sup>58' and 23<sup>0</sup>51' North Latitude and 81<sup>0</sup>59' and 82<sup>0</sup>45' East Longitude and has a forest area of 81.23%. Average rainfall is 121.36 cm. and annual mean temperature is 24<sup>0</sup>c. 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, 1992) 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 of Korlia district. Present paper deal with the final abstraction of the vegetation of the district of phytosociological behavior in the form of their Importance Value Indices revealed that maximum IVI and Species showing very low IVI were exhibited.

### Methodology

The work required extensive field survey and therefore a thorough and extensive survey of the five blocks of the Korlia district of Chhattisgarh was done during the years 2004 to 2008.

The district comprises of 5 Development Blocks, viz. Baikunthpur, Sonhat, Manendragarh, Khadgawan and Bharatpur. Each development block included study sites which were widely separated from each other, encompassing an area of 20 km to 200 km. The study sites were selected randomly from each block. (Fig.-1).

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**Figure 1: Insert Here**  
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The phytosociological characters, such as, % frequency, density and abundance were also recorded as per method described by Mishra (1968). Diameter at breast height (girth) has been measured for mature tree species. For herbs and

small plants, basal area was measured. The data were quantitatively analyzed for relative values of frequency, density and dominance. These values were added to compute Importance Value Index (IVI) as per Curtis (1959).

The formulae are as under:-

$$\text{Relative Frequency (R.F.)} = \frac{\text{No. of occurrences of the species}}{\text{No. of occurrences of all species}} \times 100$$

$$\text{Relative Density (R.D.)} = \frac{\text{Total no. of individuals of the species}}{\text{No. of individuals of all the species}} \times 100$$

$$\text{Relative Dominance (R.Dom.)} = \frac{\text{Total basal area of the species}}{\text{Total basal area of all species}} \times 100$$

$$\text{Importance Value Index (IVI)} = \text{RF} + \text{RD} + \text{R.Dom.}$$

## Result & Discussion

The final abstraction of phytosociological behaviour in the form of their Importance Value Indices revealed that maximum IVI were exhibited by *Woodfordia fruticosa* (28.65), *Shorea robusta* (23.25), *Dodonaea viscosa*, *Albizia odoratissima* and *Lawsonia inermis* ranked second in the range of 16.99 to 17.87 and *Butea monosperma*, *Corchorus trilocularis*, *Vanda roxburghii* and *Cymbopogon martini* were third ranking species, so far as the IVI is concerned. On the basis of IVI, *Woodfordia fruticosa* appears to be dominant tree species in the district. *Shorea robusta* was recorded as co-dominant in the present study. It ranked next to *Woodfordia fruticosa* in terms of IVI.

Species showing very low IVI were *Leea macrophylla* (0.148), *Lasiosiphon eriocephalus* (0.641), *Curculigo orchioides* (0.1052), *Embelia ribes* (0.1131), *Cordia macleodii* (0.1586), *Grewia tiliaefolia* (0.2247), *Rauwolfia serpentina* (0.2365), *Celastrus paniculata* (0.2363), *Manihot glaziovii* (0.3499), *Abelmoschus moschatus* (0.3932) and *Hedychium coronarium* (0.4385), *Grewia hirsuta* (0.6044), *Tecomella undulata* (0.6695), *Chlorophytum tuberosum* (0.6992), *Gymnema sylvestre* (0.9452), *Acacia concinna* (0.9719) and *Prosopis spicigera* (0.9784). (Table-1)

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Adhikari *et al.* (2003) have analysed the composition, distribution and use pattern of medicinal trees of Uttaranchal State in different eco-regions. They have concluded that 86%, 32%, 11%, 5% and 2% species are present in different regions. Out of these, 128 species are exclusively sub-tropical. Thakur *et al.* (2008) have reported *Tectona grandis* as dominant tree species in forest vegetation of Sagar district on the basis of I.V.I. Record of more phytosociological analysis on vegetation of different regions have also been reported by various workers like Nath *et al.* (2000), Pandey *et al.* (2002), Awasthi *et al.* (2007) and Thakur *et al.* (2009). In all these studies emphasis has been given to vegetation as a whole. In present study, analysis has been done especially emphasizing medicinal plants.

Suraj and Menon (2005) have enumerated phytosociological analysis of woody vegetation along an altitudinal gradation in Ponnudi 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 Ponnudi 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, regeneration potential and conservation status.

Kumar *et al.* (2006) have analysed phytosociological characteristics and diversity patterns of tropical forest tree species in Garo hills, western Meghalaya, North-east India.

Rastogi and Rastogi (2007) have performed phytosociological analysis of the restored *Sal* (*Shorea robusta*) plantations and natural *Sal* forest of Tripura. They have enumerated 68 plant species belonging to 41 taxonomic families.

Thakur and Khare (2009) have studied composition of forest vegetation and floristics of Sagar district in Central India. They have identified six forest communities on the basis of IVI (Importance Value Indices). The distribution pattern was contagious. A total of 73 tree species were recorded, belonging to 32 families of angio-sperms. They have also calculated the percentage of generic coefficient inferring the existence of more intergeneric competitions.

Bijalwan *et al.* (2009) have done phytosociological analysis of overstorey and understorey woody perennials along with 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.

Shameem *et al.* (2011) have studied to investigate the comparative assessment of edaphic factors and phytodiversity of herbaceous vegetation on seasonal basis, at two different ecosystems in lower Dachigam National Park, Kashmir Himalaya. Phytosociological attributes of plant species were studied by randomly laying 25 quadrats of 1×1 m<sup>2</sup> size at both sites. The vegetation data recorded was quantitatively analysed for density, frequency and abundance.

Shaheen Hamayun *et al.* (2012) 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. More than 2500 out of total 10700 Himalayan plants are reported in HKH including the important endemic taxa Current study was undertaken to get information about alpine vegetation structure and community distribution in Karambar lake surroundings,

Ndah Njoh Roland *et al.* (2013), They studied assessed the diversity and distribution of trees and shrubs in a 16 ha disturbed plot in the Takamanda Rainforest. A total of 99 species (72 trees and 27 shrubs) belonging to 87 genera and 34

families were recorded. The Importance Value Index (IVI) of trees was highest for *Baphia nitida* (20.06) while the lowest was recorded for *Millettia sanagana* (0.51). For shrubs, *Chytranthus macrobotrys* had highest IVI of 45.05 while the lowest was observed in *V. Africana* (1.24).

## Conclusion

High IVI of a species indicates its dominance and ecological success and good power of regeneration and greater ecological amplitude. Very less values of IVI of above plants clearly denote their rareness and poor power of regeneration and very low degree of ecological amplitude. They require effective conservational measures for their ecological success in the natural forest ecosystem of Kororia district.

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## Annexure

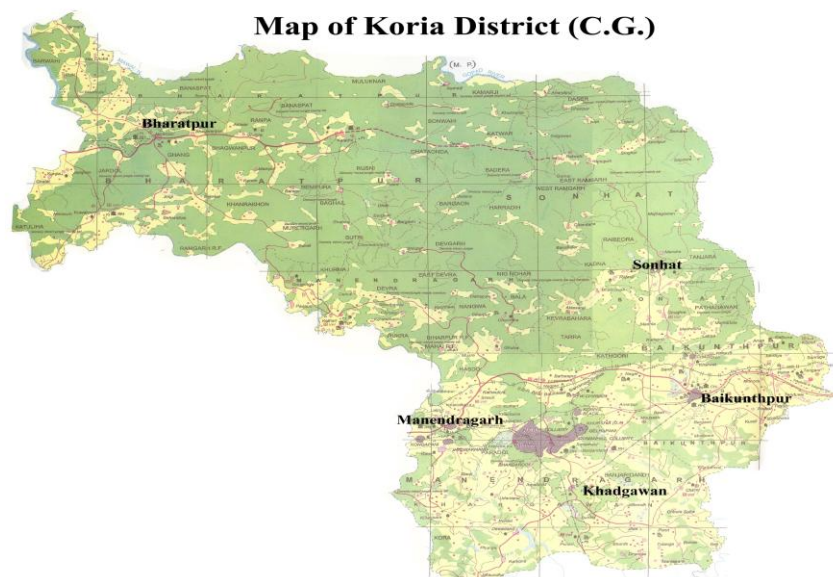


Figure 1: Map of Kororia District Highlighting 5 Developmental Block.

Table -1: Importance Value Index (IVI) of Different Medicinal Plant Species of Korla District.

S.No.	Plant species	Relative Density Relative Frequency		Relative Dominance		I.V.I.
		(R.D.)	(R.F.)	(R.Dom.)	(R.D.+R.F.+R.Dom.)	
1.	<i>Abelmoschus moschatus</i> L.	0.07319	0.1527	0.1674		0.39329
2.	<i>Abrus precatorius</i> L.	1.1710	0.9167	1.5562		3.6439
3.	<i>Abutilon indicum</i> G. Don.	0.7319	0.9167	1.1041		2.7527
4.	<i>Acacia catechu</i> Willd.	0.2927	0.7639	1.1074		2.164
5.	<i>Acacia concinna</i> DC.	0.07319	0.6111	0.2877		0.97199
6.	<i>Acorus calamus</i> L.	0.8783	0.3819	0.1293		1.3895
7.	<i>Adhatoda vasica</i> Nees.	0.4391	1.5278	4.2806		6.2475
8.	<i>Adiantum lunulatum</i> Burm.	0.1463	0.3055	0.7903		1.2421
9.	<i>Adina cordifolia</i> Hook.f.	0.763	0.132	2.936		3.831
10.	<i>Alangium lamarckii</i> Thw.	1.8296	1.5863	6.0289		9.4448
11.	<i>Albizzia odoratissima</i> Benth.	2.544	2.895	12.184		17.623
12.	<i>Aloe barbadensis</i> Mill.	0.2927	1.5278	2.3611		4.1816
13.	<i>Alstonia scholaris</i> Brown.	1.4638	0.9167	3.3065		5.687
14.	<i>Amomum subulatum</i> Roxb.	0.763	0.113	0.446		1.322
15.	<i>Amorphophallus campanulatus</i> Blume.	0.508	0.151	0.123		0.782
16.	<i>Anamirta cocculus</i> W.& A.	1.084	0.984	1.2053		3.273
17.	<i>Andrographis paniculata</i> Nees.	0.8051	0.9167	2.6872		4.409
18.	<i>Anona reticulata</i> L.	0.763	0.170	0.2827		1.215
19.	<i>Anthocephalus cadamba</i> Miq.	1.017	0.170	1.572		2.759
20.	<i>Aristolochia indica</i> L.	1.017	0.291	0.0987		1.406
21.	<i>Artemisia maritima</i> Linn.	0.768	0.143	0.436		1.347
22.	<i>Asparagus racemosus</i> Willd.	0.4391	0.9167	1.05316		2.40896
23.	<i>Bacopa monnieri</i> Linn.	1.017	3.069	0.208		4.294
24.	<i>Barleria cristata</i> L.	0.1463	0.7639	0.7168		1.627
25.	<i>Barleria prionitis</i> L.	0.763	1.228	0.500		2.491
26.	<i>Bauhinia purpurea</i> L.	1.017	0.317	1.939		3.273
27.	<i>Bauhinia vahlii</i> W.&A.	0.2195	1.2987	3.6351		5.1533
28.	<i>Bauhinia variegata</i> L.	0.2927	1.2987	2.3642		3.9556
29.	<i>Bixa orellana</i> L.	0.04391	0.3055	0.0377		0.38711
30.	<i>Blumea lacera</i> DC.	0.7319	1.4514	2.7416		4.9249
31.	<i>Boerhaavia diffusa</i> L.	0.2927	1.06951	0.5748		1.93701
32.	<i>Boswellia serrata</i> Roxb.	1.526	0.332	4.724		6.582
33.	<i>Bryonopsis laciniosa</i> L.	0.5855	0.9167	3.0177		4.5199
34.	<i>Bryophyllum calycinum</i> Salis.	0.5123	0.6111	0.2972		1.4206
35.	<i>Buchanania lanzan</i> Spreng.	0.763	0.120	0.416		1.299

S.No.	Plant species	Relative Density Relative Frequency		Relative Dominance		I.V.I.
		(R.D.)	(R.F.)	(R.Dom.)	(R.D.+R.F.+R.Dom.)	
36.	<i>Butea monosperma</i> Lamk.	2.798	4.510	7.6609	14.968	
37.	<i>Caesalpinia bonducella</i> Fleming.	1.526	0.782	3.717	6.025	
38.	<i>Canna indica</i> L.	1.272	0.744	1.415	3.431	
39.	<i>Cannabis corniculata</i> L.	1.017	0.400	2.175	3.592	
40.	<i>Carissa spinarum</i> L.	2.9277	1.2223	6.5228	10.6728	
41.	<i>Cassia fistula</i> L.	0.8772	0.6578	2.7325	4.267	
42.	<i>Cassia glauca</i> Lamk.	0.1463	0.9167	2.4511	3.5141	
43.	<i>Cassia sophera</i> L.	4.3915	1.3750	0.5979	6.3644	
44.	<i>Celastrus paniculata</i> Willd.	0.02927	0.1527	0.05435	0.23632	
45.	<i>Centella asiatica</i> L.	0.3659	0.4583	0.5029	1.3271	
46.	<i>Chlorophytum tuberosum</i> Baker.	0.07319	0.3819	0.2442	0.69929	
47.	<i>Chloroxylon swietenia</i> DC.	1.017	2.854	8.4133	12.284	
48.	<i>Cinnamomum tamala</i> Fr. Nees.	0.8783	0.7639	3.1459	4.7881	
49.	<i>Cissus quadrangularis</i> L.	1.4638	0.8403	0.20044	2.50454	
50.	<i>Cleome gynandra</i> L.	1.272	2.589	0.878	4.739	
51.	<i>Clerodendron infortunatum</i> Gaertn.	0.763	0.385	1.386	2.534	
52.	<i>Clerodendron serratum</i> Spreng.	0.1463	0.9167	2.5479	3.6109	
53.	<i>Clitoria ternatea</i> L.	0.5123	0.9167	2.2561	3.6851	
54.	<i>Cochlospermum religiosum</i> DC.	1.543	0.710	1.581	3.834	
55.	<i>Colebrookia oppositifolia</i> Smith.	2.290	5.980	1.2174	9.487	
56.	<i>Coleus aromaticus</i> Roxb.	1.763	2.362	4.801	8.926	
57.	<i>Convolvulus pluricaulis</i> Chois.	0.6587	1.1459	3.4488	5.2534	
58.	<i>Corchorus trilocularis</i> L.	2.544	2.725	9.249	14.518	
59.	<i>Cordia macleodii</i> Hook.F. & Thomson	0.0742	0.0423	0.04213	0.1586	
60.	<i>Cordia myxa</i> L.	0.2195	0.9167	1.0117	2.1479	
61.	<i>Costus speciosus</i> Smith.	1.272	0.597	0.689	2.558	
62.	<i>Crinum asiaticum</i> L.	1.781	0.8922	0.302	2.975	
63.	<i>Crotalaria juncea</i> L.	1.6728	1.06951	4.3655	7.10781	
64.	<i>Croton tiglium</i> L.	0.03659	0.1527	0.3442	0.53349	
65.	<i>Cryptolepis buchanani</i> Roem.	1.017	0.574	1.364	2.955	
66.	<i>Curculigo orchioides</i> Gaertn.	0.007319	0.07639	0.02155	0.10525	
67.	<i>Curcuma amada</i> Roxb.	1.017	0.415	0.983	2.415	
68.	<i>Curcuma angustifolia</i> Roxb.	0.4391	0.6111	1.09787	2.14807	
69.	<i>Curcuma aromatica</i> Salisb.	0.763	4.393	1.788	6.944	
70.	<i>Cuscuta reflexa</i> Roxb.	2.3421	1.3750	2.1555	5.8726	
71.	<i>Cymbopogon flexuosus</i> Hack.	1.017	2.491	5.916	9.424	
72.	<i>Cymbopogon martini</i> Stapf.	4.8175	2.3512	6.0231	13.191	
73.	<i>Cyperus rotundus</i> L.	3.5213	1.1329	3.7651	8.4193	

S.No.	Plant species	Relative Density	Relative Frequency	Relative Dominance		I.V.I.
		(R.D.)	(R.F.)	(R.Dom.)	(R.D.+R.F.+R.Dom.)	
74.	<i>Cyperus scariosus</i> Br.	1.272	1.183	0.481		2.936
75.	<i>Dalbergia latifolia</i> Roxb.	2.0493	1.06951	6.6284		9.74721
76.	<i>Desmodium gangeticum</i> DC.	0.5855	0.9167	2.9746		4.4768
77.	<i>Dioscorea bulbifera</i> L.	0.8783	0.9931	1.0777		2.9491
78.	<i>Dioscorea daemona</i> Roxb.	0.2195	0.6875	1.5807		2.4877
79.	<i>Diospyros melanoxylon</i> Roxb.	1.1710	1.5278	5.00163		7.70043
80.	<i>Dodonaea viscosa</i> L.	2.659	3.835	11.378		17.872
81.	<i>Dryopteris crenata</i> Christ.	0.4391	1.1459	1.4370		3.022
82.	<i>Eclipta alba</i> Hassk.	0.9515	1.2987	0.9771		3.2273
83.	<i>Elaeocarpus ganitrus</i> Roxb.	0.508	0.132	0.658		1.298
84.	<i>Embelia ribes</i> Burm.	0.01463	0.07639	0.02208		0.1131
85.	<i>Embelia robusta</i> Roxb.	0.508	0.215	0.658		1.381
86.	<i>Erythrina indica</i> Lamk.	0.1463	0.4583	6.1067		6.7113
87.	<i>Eulophia campestris</i> Wall.	0.763	0.355	0.385		1.503
88.	<i>Euphorbia neriifolia</i> L.	1.272	0.627	1.277		3.176
89.	<i>Euphorbia thymifolia</i> L.	0.508	0.570	0.0774		1.155
90.	<i>Euphorbia tirucalli</i> L.	0.508	0.347	0.354		1.209
91.	<i>Ficus glomerata</i> Roxb.	1.017	0.136	1.5766		2.729
92.	<i>Ficus hispida</i> L.	1.017	0.211	1.8864		3.114
93.	<i>Ficus infectoria</i> Roxb.	0.2927	1.06951	1.7910		3.15321
94.	<i>Flemingia chappar</i> Ham.	0.508	1.202	0.407		2.117
95.	<i>Flemingia nana</i> Roxb.	0.763	0.612	0.124		1.499
96.	<i>Fumaria parviflora</i> Lamk.	1.1710	0.7639	1.1550		3.0899
97.	<i>Garcinia indica</i> L.	1.017	0.480	1.9884		3.485
98.	<i>Gardenia lucida</i> Roxb.	0.0463	0.9543	0.7853		1.7841
99.	<i>Gloriosa superba</i> L.	1.526	0.499	0.846		2.871
100.	<i>Glossogyne pinatifida</i> DC.	1.272	1.221	0.414		2.907
101.	<i>Gmelina arborea</i> Roxb.	0.508	0.219	7.324		8.051
102.	<i>Grevillea robusta</i> A.Cumm.	1.526	0.306	1.682		3.514
103.	<i>Grewia hirsuta</i> Vanb.	0.07319	0.3819	0.1494		0.60449
104.	<i>Grewia tiliaefolia</i> Vahl.	0.02196	0.1527	0.0501		0.22476
105.	<i>Gymnema sylvestre</i> R.Br.	0.4391	0.3050	0.2011		0.9452
106.	<i>Hedychium coronarium</i> Koenig.	0.08783	0.3055	0.04518		0.43851
107.	<i>Helicteres isora</i> L.	0.3659	0.9167	4.3145		5.5971
108.	<i>Hemidesmus indicus</i> Br.	0.6587	0.9167	1.8250		3.4004
109.	<i>Holoptelea integrifolia</i> Planch.	2.544	0.820	1.691		5.055
110.	<i>Holarrhena antidysenterica</i> Wall.	0.6587	1.3750	3.9768		6.0105
111.	<i>Hygrophila augustifolia</i> R.Br.	3.5132	1.1459	3.9661		8.6252

S.No.	Plant species	Relative Density	Relative Frequency	Relative Dominance		I.V.I.
		(R.D.)	(R.F.)	(R.Dom.)	(R.D.+R.F.+R.Dom.)	
112.	<i>Hymenodictyon excelsum</i> Wall.	0.1463	0.7639	0.6310		1.5412
113.	<i>Hyptis suaveolens</i> Poit.	1.526	4.253	1.731		7.51
114.	<i>Ipomoea digitata</i> L.	1.781	0.839	0.227		2.847
115.	<i>Ipomoea mauritiana</i> Lam.	0.508	0.207	0.0564		0.7714
116.	<i>Jatropha curcas</i> L.	2.9277	1.3750	4.6481		8.9508
117.	<i>Jatropha gossypifolia</i> L.	4.3915	1.2223	16.8266		22.4404
118.	<i>Jussiaea suffruticosa</i> L.	2.290	5.772	6.804		14.866
119.	<i>Kaempferia rotunda</i> L.	0.5855	0.7639	0.4144		1.7638
120.	<i>Lansea grandis</i> Roxb.	0.1463	1.1459	1.9342		3.2264
121.	<i>Lasiosiphon eriocephalus</i> Decne.	0.508	0.0567	0.0769		0.641
122.	<i>Lawsonia inermis</i> L.	4.3915	1.5278	11.0752		16.9945
123.	<i>Leea macrophylla</i> Horn.	0.508	0.0151	0.0821		0.148
124.	<i>Lepidium sativum</i> L.	0.763	0.298	0.0405		1.101
125.	<i>Leucas cephalotes</i> Spreng.	0.5855	1.06951	3.9646		5.61961
126.	<i>Lippia nodiflora</i> Rich.	0.763	1.750	0.356		2.869
127.	<i>Litsea glutinosa</i> Lour.	1.017	0.321	3.156		4.494
128.	<i>Luffa aegyptiaca</i> Mill.	0.2195	0.6111	0.5460		1.3766
129.	<i>Manihot glaziovii</i> Mull.	0.508	0.102	0.197		0.3499
130.	<i>Martynia diandra</i> Glox.	0.2927	0.4583	1.3419		2.0929
131.	<i>Melia azedarach</i> L.	1.272	0.362	0.3565		1.990
132.	<i>Mimosa pudica</i> L.	1.4638	0.6111	0.3448		2.4197
133.	<i>Mimusops hexandra</i> Roxb.	1.272	1.153	0.313		2.738
134.	<i>Mucuna prurita</i> Hook.	0.4391	0.6875	0.1426		1.2692
135.	<i>Murraya koenigii</i> Spreng.	1.017	0.465	1.577		3.059
136.	<i>Nyctanthes arbor-tristis</i> L.	0.3659	0.7639	3.9680		5.0978
137.	<i>Ocimum basilicum</i> L.	1.9030	1.4514	4.9289		8.2833
138.	<i>Odina wodier</i> Roxb.	0.768	0.268	0.1823		1.218
139.	<i>Operculina turpethum</i> L.	0.760	0.136	0.120		1.016
140.	<i>Oroxylum indicum</i> Vent.	0.783	0.185	1.160		2.128
141.	<i>Ougeinia dalbergioides</i> Benth.	0.1463	1.1459	1.8006		3.0928
142.	<i>Oxalis corniculata</i> L.	1.7566	1.06951	0.8909		3.71701
143.	<i>Oxystelma esculentum</i> Br.	1.526	1.977	0.670		4.173
144.	<i>Paederia foetida</i> L.	1.781	0.820	1.113		3.714
145.	<i>Pandanus odoratissimus</i> Roxb.	0.763	0.914	2.793		4.47
146.	<i>Passiflora incarnata</i> L.	1.272	0.347	0.06425		1.6832
147.	<i>Pedaliium murex</i> L.	0.763	0.688	2.101		3.552
148.	<i>Pergularia extensa</i> N.E.Br.	0.5123	1.1459	2.5147		4.1729
149.	<i>Phyllanthus niruri</i> L.	2.3421	1.4514	2.2417		6.0352

S.No.	Plant species	Relative Density		Relative Frequency		Relative Dominance		I.V.I.
		(R.D.)	(R.F.)	(R.Dom.)	(R.D.+R.F.+R.Dom.)			
150.	<i>Picrorhiza kurroa</i> Benth.	1.017	1.100	1.118	3.235			
151.	<i>Piper longum</i> L.	1.0246	0.7639	1.4183	3.2068			
152.	<i>Pluchea lanceolata</i> Oliver & Hiern.	0.4391	0.9167	1.1063	3.4621			
153.	<i>Plumbago zeylanica</i> L.	0.8783	0.5347	2.1842	3.5972			
154.	<i>Pongamia pinnata</i> Pierre.	1.517	0.578	1.653	3.748			
155.	<i>Premna integrifolia</i> L.	1.037	0.264	1.690	2.991			
156.	<i>Prosopis spicigera</i> L.	0.272	0.0134	0.693	0.9784			
157.	<i>Psoralea corylifolia</i> DC.	1.7566	1.1459	0.9784	3.8809			
158.	<i>Pterocarpus marsupium</i> Roxb.	1.121	0.657	0.524	2.302			
159.	<i>Pterospermum acerifolium</i> Willd.	0.1463	0.9931	3.4626	4.602			
160.	<i>Pueraria tuberosa</i> DC.	1.526	0.268	0.728	2.522			
161.	<i>Quisqualis indica</i> L.	0.2195	0.6875	1.1783	2.0853			
162.	<i>Randia dumetorum</i> Lamk.	0.3659	1.5278	2.3611	4.2548			
163.	<i>Rauwolfia serpentina</i> Benth.	0.1464	0.0628	0.0273	0.2365			
164.	<i>Rauwolfia tetraphylla</i> L.	0.763	0.207	0.352	1.322			
165.	<i>Salmalia malabaricum</i> DC.	0.8783	0.6875	1.8452	3.411			
166.	<i>Schleichera trijuga</i> Willd.	0.648	2.162	0.801	3.611			
167.	<i>Semecarpus anacardium</i> L.	0.07319	0.6111	0.3646	1.04889			
168.	<i>Shorea robusta</i> Gaertn.	3.5994	4.875	14.7765	23.2509			
169.	<i>Sida spinosa</i> L.	0.7319	0.7639	3.08956	4.58536			
170.	<i>Smilax zeylanica</i> L.	0.2927	0.6111	1.6094	2.5132			
171.	<i>Solanum indicum</i> L.	1.526	0.956	3.568	6.05			
172.	<i>Sphaeranthus indicus</i> L.	2.3421	1.3750	2.3710	6.0881			
173.	<i>Spilanthes acmella</i> L.	0.1463	0.4583	3.2763	3.8809			
174.	<i>Sterculia urens</i> Roxb.	0.2927	0.9931	2.3215	3.6073			
175.	<i>Stevia rebaudiana</i> Bertoni.	1.017	0.729	0.990	1.845			
176.	<i>Symplocos racemosa</i> Roxb.	0.2195	0.9167	0.7130	1.8492			
177.	<i>Tecomella undulata</i> Seem.	0.007319	0.07639	0.5858	0.66950			
178.	<i>Tectona grandis</i> L.	1.526	0.612	2.375	4.513			
179.	<i>Terminalia arjuna</i> W.&A.	0.1463	0.9931	1.2902	2.4296			
180.	<i>Terminalia belerica</i> Roxb.	0.763	0.257	2.145	3.165			
181.	<i>Terminalia chebula</i> Retz.	0.369	0.238	0.6451	1.2521			
182.	<i>Terminalia tomentosa</i> W.&A.	0.2195	1.06951	4.2900	5.57901			
183.	<i>Thalictrum foliolosum</i> DC.	1.017	1.168	0.950	3.135			
184.	<i>Thysanolaena agrostis</i> Nees.	1.4638	1.2223	8.6970	11.3831			
185.	<i>Tinospora cordifolia</i> Miers.	0.763	0.574	0.857	2.194			
186.	<i>Tribulus terrestris</i> L.	1.1710	0.9931	7.2712	9.4353			
187.	<i>Triumfetta rhomboidea</i> Jacq.	2.394	1.963	3.692	8.049			



S.No.	Plant species	Relative Density	Relative Frequency	Relative Dominance		I.V.I.
		(R.D.)	(R.F.)	(R.Dom.)	(R.D.+R.F.+R.Dom.)	
188.	<i>Uraria picta</i> Desv.	1.272	0.786	0.213		2.271
189.	<i>Urginea indica</i> Kunth.	0.763	1.240	0.252		2.255
190.	<i>Vanda roxburghii</i> Br.	5.8554	1.5278	6.3372		13.7204
191.	<i>Vernonia anthelminticum</i> Willd.	1.7566	1.5278	7.1419		10.4263
192.	<i>Vernonia cinerea</i> Lees.	1.9030	1.5278	5.8917		9.3225
193.	<i>Vicia sativa</i> L.	1.9030	1.5278	3.2620		6.6928
194.	<i>Vicoa auriculata</i> Cass.	1.8298	1.4514	3.0464		6.3276
195.	<i>Vitex negundo</i> L.	1.0246	1.4514	2.2647		4.7407
196.	<i>Wedelia calendulacea</i> Less.	2.0493	1.2223	2.50039		5.77199
197.	<i>Withania somnifera</i> Dun.	1.017	0.400	0.217		1.634
198.	<i>Woodfordia fruticosa</i> Kurz.	4.272	2.398	21.982		28.652
199.	<i>Xanthium strumarium</i> L.	1.651	1.008	2.153		4.812
200.	<i>Zizyphus xylopyra</i> Willd.	0.763	0.143	1.406		2.312