TREE DIVERSITY IN AND AROUND VILLAGE SERI PALAI, JAMMU

[1]Kiran Sharma, [2]Sanjay Sharma

Department of Environmental sciences,
University of Jammu, Jammu 180001

***Abstract*: Proper recording and documenting of the richness of biodiversity is foremost for conservation. The present paper is an attempt to assess tree diversity in and around the remote village Seri Palai of Jammu (J&K).Data was collected through sample plot surveys.The survey conducted has recorded total of 31 species belonging to 17 families and 25 genera. Based on the calculations of frequency, density and abundance, IVI of each species was calculated to assess the tree diversity.Moraceae has been recorded as the largest family with 4 species followed by Fabaceae, Mimosaceae and Rutaceae with (3 species each), Anacardaceae, Meliaceae, Myrtaceae and Rhamnaceae with (2 species each). Acacia modesta was found to be the dominant tree species followed by Butea monosperma respectively in forest area. Out of all tree species observed in outside forest area, Butea monosperma was the dominant tree species followed by Mangifera indica. Among the different genera present in the study area, Acacia, Ficus and Citrus are reported to be dominant represented by 3 species each, followed by Zizyphus by 2 species, while rest of genera are represented by 1 species each. Ratio of family to species is 1:1.82 and genera to species as 1:1.24.**

***Keywords*: Diversity, Seri Palai, Trees, Forest, Agriculture, phytosciology.**

INTRODUCTION: The importance of trees in rural remote areas is well appreciated by rural folk. Rural people not only utilize the trees available on natural lands but also that grow in fields. All the trees can be described as potentially multipurpose but the potential uses of trees outside forest are more clearly evident. They occur as small woodlots and block plantations along linear feature e.g. roads, canals or found scattered on farmlands, community lands and in urban areas. Traditionally, trees outside forests were not inventoried and as recent quantitative information about trees outside forests is scarce, however interest in trees outside forest has increased worldwide (FAO, 2003). Apart from the forests, the agro-forestry systems are also very prominent throughout the state of Jammu and Kashmir and are harnessed by the native communities for medicine, food, fuel, fodder, timber, etc and are means of meeting the needs of rural people for income, social and cultural benefits. In Kerala the home gardens are built around coconut orchards (Nair and Sreedharan, 1986).

NEED OF THE STUDY:

- To evaluate Phytosociological attributes namely Frequency, Density, Abundance, Basal area, Abundance to frequency ratio and Importance Value Index (IVI) of trees.
- Inventorization of trees found in and around Seri Palai for future .references.
- To assess the tree diversity of the area which includes trees within forests and trees outside forests i.e. Agriculture fields.

STUDY AREA: The present study was conducted in village Seri Palai in Akhnoor tehsil of Jammu district, J&K. Situated within a radius of 10 kilometers of Indo-Pak international border, the flora and fauna of study area have not been studied much for research purposes. The area being part of dry belt of the Shiwaliks locally called as Kandi area. The agriculture is rain fed and people of the area are dependent on the forests for fuel and fodder due to which the study area is having a degrade look. The study area have subtropical type climate and annual temperature ranges between 7 degree Celsius to 45 degree Celsius.

MATERIALS AND METHOD: To assess the tree species growing in the Seri Palai area the study area was divided into two categories i.e.
1. Forest area and
2. Out-side forest area (Agriculture area).

The random sampling was carried out wherein 35 sample plots each of 20m × 20 m were laid for tree species in the forest area and 20 plots of 50m × 50 m were laid in the class outside forest area (agriculture area) of village Seri Palai. The circumference at breast height (CBH) of the trees in each plot was noted. The tree having CBH above 25 cm were considered for inventory. The data was analyzed for Phyto-sociological study and various parameters i.e. frequency, density, abundance, basal area and IVI of each tree was assessed by recording all the tree species encountered during the field survey including both wild trees as well as domestic cultivated tree species. The Importance Value Index(IVI) was determined as the aggregate of relative frequency, relative density and relative dominance. Tree diversity in both the study areas was calculated using Shannon Wiener Index.

RESULTS AND DISCUSSIONS: The results pertaining to the study of trees in two land use/ land cover classes i.e. Forest and Agriculture of the study area are presented below.

FOREST AREA: In the present study a total of 20 species of trees were observed in the forest area representing 17 genus and 11 families (Table 1).

Various Phyto-sociological parameters like species richness, density, abundance, basal area, IVI are important indicators of diversity. The results for the above mentioned parameters studied are presented in Table 1. According to the Table 1, *Acacia modesta* was found to be the dominant tree species with basal area of 23681.42 cm^2/ha followed by *Butea monosperma* with basal area 17150.69 cm^2/ha respectively, whereas *Ficus palmata* was found the least dominant species with basal area of 430.45 cm^2/ha. The abundance and IVI of *Acacia modesta* was found to be highest having values of 7 and 60.94, with relative density, relative frequency and relative dominance values of 25.34%, 15.89% and 19.71, respectively followed by *Butea monosperma* with values of 5.41 and 46.79 respectively having values of 17.95%, 14.57% and 14.27% for relative density, relative frequency and relative dominance respectively. *Acacia modesta* was found to be the most frequent species with a frequency of 68.57 percent and density of 120 trees per hectare followed by *Butea monosperma* having frequency of 62.86 percent and density of 85 trees per hectare. The least frequent species was *Ficus palmata* having frequency value of 2.86 percent and density of 0.71 trees per hectare. The value of Shannon-Wiener index for trees in forests of study areas was found to be 1.6.

Table: 1 Phytosociological parameters of tree species in forest area of Seri Palai.

S.no	Name of species	Basal area(cm2/ha)	Density (ind/ha)	F%	A	IVI
1	*Acacia modesta* Wall.	23681.42	120	68.57	7	60.94
2	*Acacia nilotica* Willd.	6963.19	16.43	34.28	1.92	17.21
3	*Albizia lebbeck* (L.) Benth.	5791.62	11.43	17.14	2.66	11.21
4	*Azadirach indica* A. Juss.	1034.29	2.86	5.71	2	2.78
5	*Bombax ceiba* Linn	7870.83	30.71	37.14	3.31	21.64
6	*Butea monosperma* Taub.	17150.69	85	62.86	5.41	46.79
7	*Dalbergia sissoo* Roxb.	9678.96	22.86	25.71	3.55	18.84
8	*Ficus benghalensis* Linn.	3441.54	0.71	2.86	1	3.67
9	*Ficus palmata* Forssk.	430.45	0.71	2.86	1	1.17
10	*Ficus religiosa* Linn.	4458.59	0.71	2.86	1	4.52
11	*Grewia optiva* J.R. Drumm.	2932.1	18.57	22.86	3.25	11.65
12	*Lannea coromandelica* Merr.	6295.69	21.43	22.86	3.75	15.06
13	*Leucaena leucocephala*(Lam.) de wit.	1051.66	9.28	8.57	4.33	4.82
14	*Mangifera indica* Linn.	2744.14	2.86	5.71	2	4.21
15	*Melia azedarach* Linn.	2271.44	5.71	14.28	1.6	6.40
16	*Morus alba* Linn	2043.18	5	5.71	3.5	4.08
17	*Phyllanthus emblica* Linn.	2035.84	7.14	8.57	3.33	5.18
18	*Pinus roxburghii* Sarg.	6684.74	37.14	8.57	17.33	15.39
19	*Species unidentified.*	3481.05	11.43	20	2.28	9.94
20	*Zizyphus oxyphyllla* Edgew.	10122.95	63.57	54.28	4.68	34.43
	Total	120164.4	473.57	431.43		300

OUTSIDE FOREST AREA A total of 27 tree species were encountered in the 20 sample plots of dimensions, 50 x 50 m were laid in the areas outside forest and was represented by 22 genus and 18 families. Various tree species encountered in the study area during the field survey are listed in Table 2.

Table: 2 Phytosociological parameters of tree species outside forest area.

S.no	Name of species	Basal area(cm2/ha)	Density (ind/ha)	F%	A	IVI
1	*Acacia modesta* Wall.	302.94	0.8	15	1.33	4.55
2	*Acacia nilotica* Willd.	1599.79	1.2	25	1.2	10.17
3	*Albizia lebbeck* (L.) Benth.	725.56	0.4	5	2	3.39
4	*Bauhinia variegata* Linn.	159.24	0.2	5	1	1.54
5	*Bombax ceiba* Linn.	227.63	3.4	45	1.89	13.79
6	*Butea monosperma* Taub.	4545.044	9.2	75	3.07	40.55
7	*Citrus karna* Raf.	61.2	0.2	5	1	1.29
8	*Citrus limon* Burm.f	44.98	0.4	10	1	2.37
9	Citrus sinensis Linn.	61.53	0.8	10	2	3.18
10	*Dalbergia sissoo* Roxb.	1997.83	2.6	30	2.17	14.62
11	*Eucalyptus citriodora* Linn.	216	0.8	5	4	2.83
12	*Ficus palmata* Forssk.	82.55	0.2	5	1	1.34
13	*Ficus religiosa* Linn.	6038.05	1	25	1	21.31
14	*Grewia optiva* J.R. Drumm.	1827.44	3	45	1.67	17.18

15	*Lannea coromandelica* Merr.	1724.93	3.2	50	1.6	18.05
16	*Leucaena leucocephala* (Lam.) de wit.	691.152	4.4	60	1.83	19.14
17	*Mangifera indica* Linn.	10094.86	3.4	40	2.12	38.66
18	*Melia azedarach* Linn.	763.03	2	30	3	10.27
19	*Morus alba* Linn.	1065.94	1.6	25	1.6	9.55
20	*Musa paradisiaca* Linn.	441.02	0.8	5	4	3.42
21	*Prunus persica* Linn.	81.29	0.4	5	2	1.72
22	*Psidium guajava* Linn.	180.79	2	20	2.5	7.27
23	*Punica granatum* Linn.	351.18	0.2	5	1	1.22
24	Species unidentified.	708.02	1.4	35	1	9.73
25	*Syzygium cumini* Skeels.	388.53	0.4	10	1	3.26
26	*Zizyphus mauritiana* Lamk.	393.95	0.4	5	2	2.53
27	*Zizyphus oxyphylla* Edgew.	407.19	8	75	2.67	37.03
	Total	38529.65	52.4	670		300

The Phyto-sociological parameters were studied for trees outside forest and the estimated values are shown in the Table 2.Out of all tree species observed in outside forest area *Butea monosperma* was the dominant tree species with basal area of 4545.04 cm^2/ha followed by *Mangifera indica* having basal area of 10094.86 cm^2/ha whereas, *Punica granatum* was found to be the least dominant species with basal area of 351.18 cm^2/ha. The abundance and IVI of *Butea monosperma* was found to be highest with values of 3.07 and 40.55 respectively (Relative density, Relative frequency and Relative dominance values of 0.46%, 11.19% and 11.79%, respectively) followed by *Mangifera indica* with values of 2.12 and 38.66 respectively (with relative density, relative frequency and relative dominance values of 6.48%, 5.97% and 26.20% respectively).The most frequent species was found to be *Butea monosperma* and *Zizyphus oxyphylla* with a frequency of 75 percent and density of 9.2 trees per hectare and 8 trees per hectare respectively. The least frequent species were *Punica granatum, Citrus karna, Bauhinia variegata* having frequency values of 5 percent and density of 0.2 trees per hectare. The value of Shannon-Wiener index for trees outside forest of study areas was found to be 2.58.

Table 3: Shannon- Weiner Index values of tree species of study area.

Study area	Life form	Diversity
Forest	Trees	1.6
Outside forest	Trees	2.58

CONCLUSION: The phytosociological studies conducted in the study area shows *Acacia modesta and Butea monosperma* are the dominant species of trees found in the forest whereas the trees *Butea monosperma* and *Zizyphus oxyphylla* are found to be the dominant in agricultural area. It is pertinent to mention here, that no significant research have been carried in past on the phytosociological parameters of the trees in study area.It is interesting that the name of the study area, Seri Palai is derived from the local name of Butea Monosperma i.e. "palah". More research needs to be done about the tree diversity of Seri Palai. There is prevalence of fruit trees such as *Mangifera indica, Punica granatum, Citrus* spp., *Psidium gujava, Phyllanthus emblica* which are planted in the agriculture fields and home gardens of the households and form the source of income generation for the inhabitants. Regular use of tree species for multiple utility has lead to rapid depletion of trees. The study revealed that there is significant variation in the tree diversity in the agricultural fields and forest area. It is suggested that species of trees with lower IVI be given priority in conservation. There is need of proper strategies for conservation and management of economically important plant species that are under high anthropogenic pressure. The data generated in the study can serve as baseline information and can be of great help for conservation and for further research in future.

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