



Study of Ecological diversity of Shahdol division forest

Virendra Vishwakarma¹, GS Sandya²

¹ Research Scholar, Department of Botany, Pt. S.N.S. Govt. P.G. College, Shahdol, Madhya Pradesh, India

² Assistant Professor, Department of Botany, Pt. S.N.S. Govt. P.G. College, Shahdol, Madhya Pradesh, India

Abstract

The present paper deals the ecological diversity of Shahdol division forest. Biodiversity has become most important aspect of present day world. Large areas of forests, particularly in districts like Shahdol, have been converted in to cultivated areas. The present studies were made to evaluate ecological studies of vegetation of Jaitpur forest of Shahdol district. The trees were measured for their Frequency, Density and basal area and then IVI of trees was calculated with the help of calculating relative value of frequency, density and basal area.

Keywords: ecological, diversity, Shahdol forest Jaitpur

1. Introduction

Forest does not comprise of tree alone. In any natural forest, shrubs, climbers and grasses grow in different proportion along with tree, and are very important components of the forest ecosystem. In the past shrubs and bushes have been meeting the fuel-wood requirements of the local population both from the forests as well as those found growing on the village waste land and field boundaries. But due to repeated cutting for fuel wood, fodder and other purpose they are under great pressure. As a result we see that these shrubs have almost disappeared from the village wastelands and many forest areas adjoining habitation. Forest is one of the most predominant geographic features of this planet in which we live and influence the lives of human beings in many ways. They moderate local climate, reduce soil erosion, regulate the stream flow, improve ground water conditions, improve condition of floods, increase precipitations, provide shelter to the wide variety of fauna and flora, supply food, fuel and shelter to the human population, support a number of industries and provide remarkable opportunities for recreation. Some of these influences can be evaluated in terms of money value in Rupees but others are not, but are equally important. These aspect of influences are; - Climate, temp., wind, humidity, precipitation; forest and soil conditions; water table, and erosion etc.

The entire crop of the Shahdol forest Division is mostly middle aged in nature. The range has been visited between July 2017 to December 2018 in various seasons to understand the natural composition vegetation and trend is change due to increasing urbanization in rural is change due to increasing urbanization in rural areas. Detailed phytosociological study of forest Jaitpur has been made. In selected forest the study has been made by laying down ten suitable quadrates in forest to highlights the trends in change of community due to increased influence of man and his domestic animals. The present studies were made to evaluate ecological studies of vegetation of Jaitpur forest of Shahdol district. The trees were measured for their Frequency, Density, basal area and then IVI of trees was calculated with the help of calculating relative value of

frequency, density and basal area.

2. Review of Literature

Work on rare medicinal plants has not been very regular or effective but it has only been sporadic and was given secondary position in survey and taxonomical studies in the past, In India only work carried out by Botanical survey of India; FRLHT and various reports and documents has been published on conservation, assessment and management of threatened species by Mueller-Domboic, & Ellenberg, (1974) ^[1], Aim and Methods of Vegetation Ecology. Red Data book was bought out by Botanical survey of India, which is followed by second and third volume (Nayar and Shastry 1987-1990) ^[2]. Ordination method in Ecology (Anderson, 1971) ^[3]. Name changes in flowering plants of India and adjacent region (Bennett, 1986) ^[4]. Studies of Teak plantation and mixed natural forest in Madhya Pradesh (Chaubey, *et al.* 1988) ^[5]. Medicinal Plants (India) Karki (2002) ^[6]. Principal and practice of ayurvedic medicine. Biotech Book. Delhi (Khory, 2004) ^[7]. Ecological diversity and its Measurement. (Magurran, 1988) ^[8].

3. Methodology and Result

For phytosociological studies in all the forest Jaitpur of Shahdol division, the quadrat methods were used. In each forest 10 quadrates laid down for tree & shrubs. The size of quadrates for trees were 10 m. sq. and for shrubs, 5m. sq. and these were determined by the species area curve. The quadrates for shrubs were laid down inside the bigger quadrates of tree. There was a gap of ten meters between two quadrates of trees.

Basal was calculated from the perimeter which was measured at a breast height or below the first branching which ever was less.

Relative Frequency, Relative density and relative dominance were calculated by the following formulas (Phillips, 1959, Misra *et al.* 1956).

$$\text{Basal area} = \frac{(\text{Circumference at breast height})^2}{12.56}$$

$$\text{Frequency (\%)} = \frac{\text{No. of sampling plots in which the species is present}}{\text{Total no. of plots sampled}} \times 100$$

$$\text{Density (Ha}^{-1}\text{)} = \frac{\text{No. of individuals of the species}}{\text{Total area sampled (ha)}}$$

$$\text{Abundance} = \frac{\text{No. of individuals of the species}}{\text{No. of sampling plots in which the species is present}}$$

$$\text{Relative basal area} = \frac{\text{Basal area of the species}}{\text{Basal area of all the species}} \times 100$$

$$\text{Relative frequency} = \frac{\text{Frequency of the species}}{\text{Frequency of the all species}} \times 100$$

$$\text{Relative Density} = \frac{\text{Density of the species}}{\text{Density of all the species}} \times 100$$

$$\text{Relative abundance} = \frac{\text{Abundance of the species}}{\text{Abundance of all the species}} \times 100$$

IVI (of trees) = Relative basal area + Relative frequency + Relative density

Importance value Index (IVI) was calculated by adding the values of Relative Frequency, Relative Density and Relative Basal area.

Table 1: Value for different parameters, recorded for different tree species of Jaitpur forest

S. No.	Name of species	No. of quadrat	No. of trees	Density	Frequency	BA	RF	RD	RBA	IVI
1.	<i>Shorea robusta</i>	10	75	3.4	9.9	3641.48	9.9	31.12	14.48	55.5
2.	<i>Terminalia arjuna</i>	9	10	0.45	8.91	6616.75	8.91	4.1	26.32	39.33
3.	<i>Terminalia bellerica</i>	5	20	0.9	4.95	4838.2	4.95	8.23	19.25	32.43
4.	<i>Terminalia chebula</i>	10	19	0.86	9.9	2108.21	9.9	7.87	8.38	26.15
5.	<i>Embelica officinalis</i>	10	7	0.31	9.9	2244.5	9.9	2.83	8.93	21.66
6.	<i>Tamarindus indica</i>	8	16	0.72	7.92	1053.89	7.92	6.59	4.19	18.7
7.	<i>Cassia fistula</i>	7	22	1	6.93	313.59	6.93	9.15	1.24	17.32
8.	<i>Bauhinia variegata</i>	5	16	0.72	4.95	1332.03	4.95	6.59	5.3	16.84
9.	<i>Cordia macleodii</i>	6	10	0.45	5.94	1040.23	5.94	4.1	4.13	14.17
10.	<i>Madhuca indica</i>	3	6	0.27	2.97	227.58	2.97	2.47	0.9	6.34
11.	<i>Pongamia glabra</i>	3	7	0.31	2.97	110.2	2.97	2.83	0.43	6.23
12.	<i>Azadirachta indica</i>	3	6	0.27	2.97	183.43	2.97	2.47	0.72	6.16
13.	<i>Magnifera indica</i>	3	3	0.136	2.97	443.99	2.97	1.24	1.76	5.97
14.	<i>Nyctanthus arbortristis</i>	2	2	0.09	1.98	571.68	1.98	0.82	2.27	5.07
15.	<i>Acacia catechu</i>	3	4	0.18	2.97	109.01	2.97	1.64	0.43	5.04
16.	<i>Ficus benghalensis</i>	3	3	0.136	2.97	29.99	2.97	1.24	0.119	4.329
17.	<i>Melia azadirach</i>	2	3	0.136	1.98	29.99	1.98	1.24	0.119	3.339
18.	<i>Ficus religiosa</i>	2	3	0.136	1.98	22.68	1.98	1.24	0.09	3.31
19.	<i>Ricinus communis</i>	2	2	0.09	1.98	113.31	1.98	0.82	0.45	3.25
20.	<i>Sizigium cumini</i>	2	2	0.09	1.98	70.34	1.98	0.82	0.27	3.07
21.	<i>Anthocephalus chinensis</i>	2	2	0.09	1.98	19.99	1.98	0.82	0.07	2.87
22.	<i>Ficus glomerata</i>	1	4	0.18	0.99	11.45	0.99	1.64	0.045	2.675
	<i>Total</i>	101	242	10.924	99.99	25132.52	99.99	99.87	99.893	299.753

B.A.- Basal Area, R.F.-Relative Frequency, R.D.- Relative Density, R.BA- Relative Basal Area IVI-Importance Value Index.

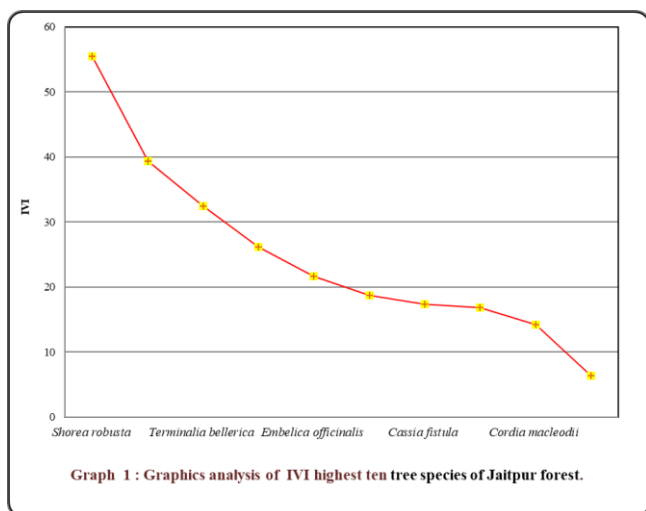


Fig 1

From the table no 1 observation indicates that *Shorea*

robusta had highest density and maximum IVI of 2.675 and 55.5 respectively. Thus the most important tree in the village area is *Shorea robusta*. This is because the *Shorea robusta*, all of them are of larger girth. This fact indicates that the *Shorea robusta* tree, because of their economic value, have been selectively, left uncut, during the cutting of trees in the forest, while the forest were was converted in to cultivated fields, It is interesting also to note a good IVI value of 55.5 for *Shorea robusta*. The species is little affected by animals through grazing or trampling and thus become more abundant in cleared forest areas. Minimum IVI of 2.675 for *Ficus glomerata* is recorded in the survey.

4. Conclusion

The present study will be great helpful in evolving a complete biodiversity picture of Jaitpur forest community and will help in managing of certain species in native forest ecosystem. This research helps to better plan of biodiversity conservation and its Socio-Economic significance. In this study various formulas were used for calculating relative frequency, relative density, relative basal area and IVI.

5. Acknowledgement

The authors are highly thankful to authorities of Pt. S.N.S.

Govt. P.G. College, Shahdol who permitted to carry out this work.

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