

DISTRIBUTION PERCENTAGE AND RELATIVE FREQUENCY OF FOREST FLORA OF DISTRICT SHOPIAN JAMMU AND KASHMIR (INDIA)

Raiees Ahmad Jan[■], Neelam Khare[♦] and Afaq Majiid Wani[□]

Received 18-05-2015
Accepted 18-04-2016

ABSTRACT

The presented investigation of distribution, relative frequency structure of vegetation in District Shopian, Jammu and Kashmir. At 45 plants belong to 30 families were documented from three localities. The most species richest site was found Pir Ki Gali site -1 with (shrubs 30 and trees 13 trees), Dubjan site -2 (shrubs 27 and trees 17) and Herpora Wildlife Sanctuary site-3 (shrubs 28 and trees 15). Among trees and shrubs (*Achillea milleflum*, *Cynodon dactylon*, *Fragaria nubicola*, *Euphorbia helioscopia*, *Geranium wallichianum*, *Mentha arvensis*, *Acer pictum*, *Abies pindrow*, *Acer speices*, *Picea smithiana* and *Pinus wallichiana* had highest distribution percentage (100%) while *Aconitum heterophyllum*, *Angelica glauca*, *Arisaemajacquemontii*, *Berberis lyceum*, *Aesculus indica*, *Ficus carica*, *Corylus columa*, *Juglans regia*, *Salix capillus* and *Salix alba* had least distribution percentage (33.3%). Species diversity was high in the trees and shrubs in the middle regions. It decreased both towards upper and lower region deforestation, human interaction, low number of species and soil erosion.

Key words :- Distribution percentage (%), relative frequency, trees and shrubs.

INTRODUCTION

Forest composition, community structure and diversity patterns are important ecological attributes significantly correlated with prevailing environmental as well as anthropogenic variables (Gairola *et al.*, 2008; Timilsina *et al.*, 2007). The forest diversity patterns and governing environmental as well as anthropogenic variables in the Himalayan subtropical region have been studied by many phytosociologists (Kharakwal *et al.*, 2009; Gairola, 2008; Ahmed *et al.*, 2006; Kunwar and Sharma, 2004). The development of human societies often has caused an overexploitation of forests and a decrease in their area. Floristic diversity means floristic variety of plant forms rich diversity suggests a great many kinds of plants species and conversely poor diversity indicates flower types of living species. On this diversity hinges the future, health and beauty of the living planet habitat of floristic diversity contain wild species and genetic variation within, it is useful in the development of agriculture, medicines and industry. The plant diversity at any site is influenced by species distribution and abundance patterns. A number of factors have been shown to affect the distribution and abundance of plant species, including site conditions, i.e., moisture and nutrient gradients (Day and Monk 1974, Whittaker and Niering 1975, Marks and Harcombe 1981, Host and Pregitzer 1992) and canopy coverage, i.e., light availability (Kull and Zobel 1991). However the investigations concerning different types of forests or similar forests located in different areas have given no concrete conclusion for pinpointing the vegetation effect since site condition are changed and it is often impossible to separate the cause from the effect. The plant diversity at any site is influenced by species distribution and abundance patterns. Species richness is controlled by a variety of biotic and abiotic parameters (Rannie, 1986). A number of factors have been shown to affect the distribution and abundance of plant species, including site conditions, i.e., moisture and nutrient gradients (Whittaker and Niering, 1975; Host and Pregitzer, 1992) are

available. Distribution of plant communities mostly depends upon the edaphic factors, like, soil texture, structure, pH, moisture and mineral composition. The varied physiography, soil and climatic conditions of the region are responsible for the luxuriant growth of various types of forest. Soil factors include all the physical, chemical and biological properties of the soil.

MATERIALS AND METHODS

Study area:

Shopian has been an ancient town of Kashmir which among other factors in the past has historical importance, since it is situated in the ancient imperial road commonly known "Mughal Road" which connects Kashmir valley with Rajouri and Poonch districts. The district enjoys a predominantly dry temperate climate. On the basis of temperature and precipitation, the district has four seasons in a year, winter (Dec.-Feb.), Spring (March-May), Summer (June-Aug.) and Autumn (Sept.-Nov). The temperature ranges from an average daily maximum of 32°C and minimum of 15°C in July to an average daily maximum of 4°C and minimum of -4°C in January. Shopian depicts rich diversity in soils. The district is bounded by Pulwama in north, Budgam in west, Kulgam in east and districts of Rajouri and Poonch in south. It lies on the latitude of 33° 72' N and a longitude of 74° 53' E. It is situated in the lapsofs foot hills of PirPanjal Range and most of its area is hilly terrain. It has an average elevation of 2057m above mean sea level.

$$\text{Percentage distribution} = \frac{\text{No. of localities in which at Plant occurs}}{\text{Total no. of localities}} \times 100$$

$$\text{Relative frequency} = \frac{\text{No. of quadrates in species occurred}}{\text{Total number of quadrates}} \times 100$$

[■]Ph.D Scholar Student, [♦]Assistant Professor [□]Associate Professor
School of Forestry and Environment, SHUATS, Allahabad - 211007 (U.P)

RESULTS AND DISCUSSION

The highest Distribution (%) among the trees and shrubs *Achillea millefolium*, *Cynodon dactylon*, *Euphorbia helioscopia*, *Fragaria nubicola*, *Geranium wallichianum*, *Mentha arvensis*, *Solanum nigrum*, *Tarasicum officinalis*, *Viola odorata*, *Abies pindrow*, *Acer speices*, *Acer pictum*, *Pieca smithiana*, *Pinus wallichiana* (100%) followed by *Adelphinium denudatum*, *Adiantum cappillus*, *Arnebia benthamii*, *Artemisia nilagirica*, *Bergenia ciliata*, *Cannabis sativa*, *Cedrus deoda*, *Frankinus flobibunda*, *Taxus baceata* and *Ulmus wallichiana* (66.66%). While least percentage distribution *Angelica glauca*, *Arisaema jacquemontii*, *Rheum emodi*, *Saussurea lappa*, *Aesculus indica*, *Corylus columa*, *Ficus carica*, *Salix capillus* and *Salix alba* (33.3). The highest relative frequency percentage (6.11 and 14.42) was observed with shrubs *Solanum nigrum* and trees *Acer species*. While the minimum relative frequency percentage (1.75

and 2.88) was recorded in shrubs *Cynodo dactylon* and trees *Pieca smithiana* in site-1. Whereas the highest relative frequency percentage (7.43% and 10.87) was observed with shrubs *Cynodo dactylon* and trees *Acers species* and the minimum relative frequency percentage (1.49 and 2.90) was recorded in shrubs *Nepeta Cateria* and trees *Pronus padus* in site -2. Whereas the highest relative frequency percentage (9.18 and 10.34) was observed with shrubs *Geranium wallichianum* and trees *Abies pindrow* and the minimum relative frequency percentage (3.06 and 3.45) was recorded in shrubs *Rumex nepalensis* and trees *Pronus pandus* in site-3. Similar findings were reported by **Tanvir et al. (2014)**. The experimental decreased in species distribution is due to deforestation, human interaction, collection of medicinal plants and quick disappearance of annula plants because of cold condition **Ram et al. (2004)**.

Table 1 : Occurrence and percentage distribution and relative frequency of vegetation District Shopian Forest.

S.No.	Scientific Name	Site-1	Site-2	Site -3	Distribution	Relative Frequency		
						Site-1	Site-2	Site -3
1	<i>Achillea millefolium</i>	+	+	+	100.00	2.62	6.93	5.10
2	<i>Aconitum heterophyllum</i>	+	-	-	33.33	3.49	1.98	-
3	<i>Adelphinium denudatum</i>	+	+	-	66.67	3.93	-	-
4	<i>Adiantum cappillus</i>	+	-	+	66.67	2.18	-	9.18
5	<i>Angelica glauca</i>	+	-	-	33.33	2.18	2.48	-
6	<i>Arisaemajacquemontii</i>	+	-	-	33.33	3.49	-	-
7	<i>Arnebia benthamii</i>	+	-	+	66.67	4.37	3.96	-
8	<i>Artemisia nilagirica</i>	+	+	-	66.67	4.37	4.46	-
9	<i>Berberis lycium</i>	-	+	-	33.33	3.49	3.96	8.16
10	<i>Bergenia ciliata</i>	+	+	-	66.67	2.18	2.48	-
11	<i>Cannabis sativa</i>	+	+	-	66.67	3.93	1.98	-
12	<i>Cynodon dactylon</i>	+	+	+	100.00	1.75	7.43	8.16
13	<i>Euphorbia helioscopia</i>	+	+	+	100.00	3.93	2.48	3.06
14	<i>Fragaria nubicola</i>	+	+	+	100.00	3.49	3.96	5.10
15	<i>Geranium wallichianum</i>	+	+	+	100.00	3.93	2.48	9.18
16	<i>Mentha arvensis</i>	+	+	+	100.00	3.49	4.46	6.12
17	<i>Nepeta Cateria</i>	+	+	-	66.67	3.49	1.49	5.10
18	<i>Polygonum nephensis</i>	+	-	+	66.67	2.18	4.46	-
19	<i>Rheum emodi</i>	+	-	-	33.33	2.18	2.48	-
20	<i>Rosa eglentaria</i>	+	-	+	66.67	3.49	4.46	6.12
21	<i>Rumex nepalensis</i>	+	+	-	66.67	2.18	2.48	3.06
22	<i>Salix caprea</i>	+	-	+	66.67	2.18	5.94	4.08
23	<i>Sambucus wightiana</i>	+	-	+	66.67	3.49	3.96	5.10
24	<i>Saussurea lappa</i>	+	-	-	33.33	3.93	2.48	-
25	<i>Solanum nigrum</i>	+	+	+	100.00	6.11	4.46	3.06
26	<i>Tarasicum officinalis</i>	+	+	+	100.00	3.93	2.48	-
27	<i>Taraxacum officinale</i>	+	-	+	66.67	3.93	5.45	3.08
28	<i>Urtica dioica</i>	+	-	+	66.67	3.49	5.94	6.12
29	<i>Viburnum grandiflorum</i>		+	+	66.67	3.93	3.47	4.08
30	<i>Viola odorata</i>	+	+	+	100.00	2.62	1.49	5.10
31	<i>Abies pindrow</i>	+	+	+	100.00	13.46	8.70	10.34
32	<i>Acer speices</i>	+	+	+	100.00	14.42	10.87	10.34
33	<i>Acer pictum</i>	+	+	+	100.00	11.54	10.14	9.49
34	<i>Aesculus indica</i>	+	-	-	33.33	11.54	9.42	7.76
35	<i>Cedrus deodar</i>	+	-	+	66.67	10.58	8.70	-

S.No.	Scientific Name	Site-1	Site-2	Site -3	Distribution	Relative Frequency		
						Site-1	Site-2	Site -3
36	<i>Corylus columa</i>	-	+	-	33.33	5.77	3.62	6.90
37	<i>Ficus carica</i>	-	-	+	33.33	-	3.62	6.90
38	<i>Frankinus flobibunda</i>	+	+	-	66.67	4.81	3.62	-
39	<i>Juglans regia</i>	-	-	+	33.33	-	2.90	7.76
40	<i>Pieca smithiana</i>	+	+	+	100.00	2.88	5.07	6.90
41	<i>Pinus wallichiana</i>	+	+	+	100.00	6.73	4.35	7.76
42	<i>Populus ciliate</i>	-	-	+	33.33	5.77	3.62	4.31
43	<i>Pronus padus</i>	-	-	+	33.33	-	2.90	3.45
44	<i>Salix alba</i>	-	-	+	33.33	-	6.52	4.31
45	<i>Salix capillus</i>	-	+	-	33.33	4.81	5.80	4.31
46	<i>Taxus baceata</i>	+	+	-	66.67	2.88	4.35	5.17
47	<i>Ulmus wallichiana</i>	-	+	+	66.67	4.81	5.80	4.31

Index: site-1= Pir ki gali, Site-2= Dubjan, Site-3=Herpora Wildlife Sanctuary, + =Present, = Absent

CONCLUSION

Based on the above result the selection of the area was its thick vegetation. The area lies in the temperate zone characterized by cold climate. Goat and Sheeps are the main grazing animals of the study area. Necessary steps should be taken not only to conserve the original vegetation but also to improve it. Over grazing and deforestation should be abridged forest management practices and warness progrmme should be introduced that may help in conservation of biodiversity.

REFERENCES

- Ahmed, M., T. Husain, A.H.S. Heikh, S.S. Hussain and M. Siddiqui. (2006). Phytosociology and structure of Himalayan forests from different climatic zones of Pakistan, *Pak. J. Bot.*, 38 (2) : 361 - 383.
- Day, F.P. Jr. and Monk, C.D. (1974). Vegetation patterns on a southern Appalachian watershed. *Ecology*, 55, 1064-1074.
- Gairola, S., R. S. Rawal and N.P. Todaria (2008). Forest vegetation patterns along an altitudinal gradient in sub-alpine zone of west Himalaya, India. *African Journal of Plant Science*, 2(6): 042-048.
- Host, G. E. and Pregitzer, K. S. (1992). Geomorphic influences on ground-flora and over story composition in upland for- Plant diversity in boreal forest of north-western Lower Michigan. *Canadian Journal of Forest Research*, 22, 1547 - 1555.
- Kharkwal, G. (2009). Diversity and Distribution of Medicinal plant species in the Central Himalaya. *Indian Academia Arena*. 1(1): 32-42.
- Kull, K. and Zobel, M. (1991). High species richness in an Estonian wooded meadow. *Journal of Vegetation Science*, 2, 711-714.
- Kunwar, R.M. and S.P. Sharma. (2004). Quantitative analysis of tree species in two community forests of Dolpa district, mid-west Nepal. *Him J Sci.*, 2(3): 23-28.
- Marks, P. L. and Harcombe, P. A. (1981). Forest vegetation of the Big Thicket, Southeast Texas. *Ecological Monographs*, 51, 287-305.
- Ram, J., Kumar, A., Bhatt, J. (2004). Plant diversity in six forest types of Uttaranchal, Central Himalaya, India. *Current Science*, 86 (7): 975-978.
- Rannie, W. F. (1986). Summer air temperature and number of vascular species in arctic Canada. *Arctic*, 39, 133-137.
- Whittaker, R. H. and Niering, W. A. (1975). Vegetation of the Santa Catalina Mountains, Arizona. V. Biomass, Production, and diversity along the elevation gradient. *Ecology*. 56: 771-790.