

## **Life Form and Index of Similarity of Communities Recorded at Kotli Hills during Monsoon 2000**

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### **Abstract**

**Qualitatively nanophanerophytes and hemicryptophytes were dominated in the investigated area followed by megaphanerophytes and therophytes. Chamaephytes and geophytes were low in number, whereas quantitatively megaphanerophytes and hemicryptophytes were dominant; they were followed by nanophanerophytes and therophytes. Geophytes were low in number. The highest index of similarity was recorded in between *Pinus-roxburghii* and *Pinus - Themeda* community. These communities were slightly similar. It is followed by *Pinus community*, *Pinus-Themeda* community and *Pinus-Carissa-Themeda* community. The values varies from 53.07-57.85. The index of similarity in these communities was almost equal due to similar habitat, soil conditions and percentage of phosphorus and equal amount of potassium in soil.**

**Keywords:** Nanophanerphytes, Emicryptophytes, Monsoon

### **Introduction**

No previous work has been done on life form and similarity index of the study area. However, Malik (1986) classified life form spectra of some plant communities of Kotli Hills qualitatively. The aim of this study was to report life form quantitatively, as well as, qualitatively, so that the original picture can be determined which is useful for environmentalists, ecologists and other fields.

### **Material and Method**

The study area lies between longitudes 73° 6' to 74° 7' East and latitude 33° 20' to 30° 40' North in the Kotli District (Toposheet No 43 G/15). The elevation ranges from 675 -1400 meters. The climate of the study area was subtropical chirpine type (Malik, 1986).

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Life form and similarity index of the study area were constructed according to Raunkiaer (1934) and Muller-Dum-Boiss and Ellenberg (1974). The vegetation of the study area were classified in to 7 plant communities on the basis of importance value which will be reported elsewhere.

A complete list of all the 7 plant communities of the study area were compiled on the basis of importance value. The life form was constructed according to Raunkiaers (1934) and Muller Dum- Boiss and Ellenberg (1974) by using the complete list of plant communities. Similarity index was recorded after Sorenson, 1948 as follow:

$$\frac{2C}{A+B} \times 100$$

This work was done during Monsoon, 2000. Nomenclature followed here is that of Stewart (1972).

### **Results and Discussion**

#### **Biological Spectrum (Life-form)**

The biological spectrum is presented in Table I. In *Adiantum-Olea* community, there were 20% megaphanerophytes, 25% each nanophanerophytes and hemicryptophytes, 20% geophytes and 10% therophytes, while Chameophytes and Lianas were absent.

In *Acacia modesta* community, megaphanerophytes and hemicryptophytes had an equal share of 25% each, 31.25% nanophanerophytes, 6.25% geophytes and 12.5% therophytes. Woody element predominates.

In *Dodonaea-Acacia-Themeda* community, the major share was made by hemicryptophytes (46.15 %) followed by nanophanerophytes (30.77%) and therophytes (15.38%), megaphanerophytes were (7.69 %). Community shows dominance of perennial herbs.

In *Pinus-Themeda* community major share of 33.33% was made by nanophanerophytes, 27.78% hemicryptophytes, 16.67% therophytes and egaphanerophytes each 5.55% geophytes. Community shows the dominance of woodey elements.

In *Imperata-Pinus* community major contribution was made by 12.5% megaphanerophytes, 25% nanophanerophytes and hemicryptophytes each, 6.25% Geophytes and 31.25% therophytes. Community indicates the dominance of annual herbs.

In *Pinus roxburghii* community the major contribution was made by 25% share of megaphanerophytes, hemicryptophytes and therophytes each; while nanophanerophytes, geophytes and chamaephytes had 8.33% share each. In *Pinus – Carissa - Themeda* community; megaphanerophytes and hemicryptophytes were dominant with 25% each, while nanophanerophytes and therophytes were 33.33 % and 16.67 % respectively.

The Monsoon plant communities harbouring at Kotli hills exhibited the dominance of nanophanerophytes followed by hemicryptophytes, therophytes and megaphanerophytes (Table 1).

**Index of similarity and Dissimilarity.**

The highest index of similarity (54.79) was recorded between *Pinus-Themeda* community and *Pinus-Carissa-Themeda* community followed by *Imperata-Pinus* community and *Pinus-Carissa-Themeda* community. The value varies from 49.35 to 54-79. These communities were similar due to similar soil conditions such as soil texture, saturation, pH and organic matter.

Intermediate similarity was recorded between *Pinus-Themeda* community, *Dodonaea-Acacia-Themeda* community, *Dononaea-Acacia-Themeda* community and *Pinus-Carissa-Themeda* community. The reason might be the nature of soil condition. Saturation percentage and equal amount of organic matter, phosphorus and potassium.

Very low similarity was recorded in between *Adiantum-Olea* community, *Pinus* community, *Acacia modesta* community and *Pinus* community respectively. It was due to altitude which varies from 675-1400 meters, soil condition, pH, organic matter and phosphorus percentage which was low.

The life form of vegetation reflects the habitat and environmental condition. The prevalence of nanophanerophytes and hemicryptophytes as the dominant group reflects that environmental condition were well suited to phanerophytes especially to nanophanerophytes. The area under investigation experiences heavy biotic pressure in the form of wood extraction felling and modification of forest in term of terrace cultivation that is why megaphanerophytes are less. It appears that megaphanerophytes and nanophanerophytes, had the dominating life form before the degradation. The degraded vegetation supports hemicryptophytic type of vegetation whereas disturbed vegetation supports therophytic type.

**Table 1: Biological Spectrum of plant communities harbouring in Kotli Hills during monsoon 2000.**

		<i>Adiantum-Olea</i> Community (AO)	<i>Acacia-modesta</i> Community (A)	<i>Dodonaea-Acacia-Themeda</i> Community (DAT)	<i>Pinus-Themeda</i> Community (PT)	<i>Imperata Pinus</i> Community (IP)	<i>Pinus roxburghii</i> Community (PR)	<i>Pinus-Carissa-Themeda</i> (PCT)
Height		675	700	740	750	800	1300	1400
Total Sp.		20	16	13	18	16	12	12
Mp	No	4	4	1	3	2	3	3
	%	20	25	7.69	16.67	12.5	25	25
Np	No	5	5	4	6	4	1	4
	%	25	31.25	30.77	33.33	25	8.33	33.33
H	No	5	4	6	5	4	3	3
	%	25	25	46.15	27.38	25	25	25
G	No	4	1	0	1	1	1	0
	%	20	6.25		5.55	6.25	8.33	
Th	No	2	2	2	3	5	3	2
	%	10	12.5	15.38	16.67	31.25	25	16.67
Ch	No						1	
	%						8.33	

**Table 2: Life form of different plant communities recorded at Kotli Hills during Monsoon 2000.**

	Life form					
	Mp	Np	H	Th	Ch	G
Raunkiaerian value (%)	18.51	27.77	26.85	17.59	1.85	7.40
Quantitative value (%)	27.75	23.49	27.01	12.05	0.36	9.32

Mp = *Megaphanerophytes*; H= *Hemicryptophytes*; Np= *Nanophanerophytes*; Th= *Therophytes*; Ch= *Chamaephytes*; G= *Geophytes*

**Table 3: Index of similarity and dissimilarity of 7 plant communities recorded from Kotli Hills during Monsoon, 2000.**

Plant Communities	Plant communities						
	AO	A	DAT	PT	IP	P	PCT
AO	X	60.99	82.61	86.71	89.35	93.05	87.30
A	39.01	X	92.28	89.95	85.42	91.75	89.12
DAT	17.39	17.12	X	66.24	74.73	80.65	68.14
PT	13.29	10.05	33.76	X	58.50	57.73	50.65
IP	10.65	14.58	25.50	41.50	X	66.40	42.21
P	6.95	8.25	18.06	42.27	33.60	X	60.52
PCT	12.70	10.88	31.86	49.35	54.79	39.48	X

AO= *Adiantum – Olea* Community; A= *Acacia* Community; DAT= *Dodonaea-Acacia-Themeda* Community  
 PT= *Pinus-Themeda* Community; IP= *Imperata-Pinus* Community; P= *Pinus* Community; PCT= *Pinus-Carissa-Themeda* Community

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