

Diversity of Forest Climbers in the Reserve Forest of Bhupdeopur of District Raigarh, Chhattisgarh

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Abstract

In the present study the emphasis is given on the study of climbers vegetation in Bhupdeopur reserve forest of Raigarh district of Chhattisgarh as the exclusive studies on climbers in forest ecosystems are the need of present ecological time. An extensive survey has been conducted to find out the various types of forest flora. 21 climber species belonging to 15 families, their local names and various uses by the local inhabitants including medicinal values were recorded during the survey. The parameters such as frequency, density, and abundance were also undertaken.

Keywords: Bhuodeopur reserve forest, Raigarh district, Chhattisgarh, forest climbers, frequency, density, abundance.

Introduction

Forests are one of the most important recognized ecosystems in the biosphere and India is rich in all aspects of Biodiversity and Ecosystems. Forests are generally considered as assemblage of trees but in actual sense it is a multistoried vegetation system in which vegetation can be classified into three main storeys, tree storey, shrub storey and herb storey.

The Climbers vegetation is also considered an important component of forest ecosystem. These plant strata are integral part of food chain for mammals and birds and control microclimate of the site. The Climbers biomass generally plays an important role in the recycling of nutrients. In forest ecosystem studies on Climbers vegetation have not been given a proper weightage like the tree constituents. Hence only a few studies on the role of climber vegetation in different types of plantation ecosystems are known. Phytosociological analysis of a plant community is an important aspect of ecological study of any piece of vegetation. Species composition is one of the important characters of plant community. Analytical character, viz., Frequency, density and abundance are very useful in the composition of two different plant communities. The present study was conducted in Bhupdeopur reserve forest of district Raigarh Chattisgarh. (Table 1).

Aim / Purpose

1. Identification of climber species of Bhupdeopur reserve forest.
2. To study the climber diversity of Bhupdeopur reserve forest.
3. Identification of endangered climber species which is of promising value.
4. To study the floristic composition of Bhupdeopur reserve forest.
5. To enlist ethnobotanical uses of climber specifically of health and livelihood security.

Materials and Methods

1. Selection of Study Sites

The present study was conducted in Bhupdeopur Reserve forest of district Raigarh, Chhattisgarh. The study area was divided into 4 circles named as Naharpali, Kerajhar, Delari and Khairpur, each circle was further divided into beats and a total of 20 beats in 16 villages were considered for the study. The study

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site is spread over in 25 km of North West of Raigarh city. The area comes under Raigarh forest range of Raigarh forest division in Raigarh and Kharsia administrative block.

Method of Sampling: In the present study Phytosociological diversity analysis was carried out by quadrat method. Random sampling of study area was done by Quadrat method following Oosting, (1958). 30x30 m quadrates were used for the sampling of climber layer. On the basis of the data obtained from the quadrat samples the structural distribution of forest climbers were analysed. The parameters such as percentage frequency, density, abundance were obtained and were calculated from the data as follows.

$$\%F = \frac{\text{Number of sampling units in which plant species occurred}}{\text{Total number of sampling units studied}} \times 100$$

$$\text{Density} = \frac{\text{Total number of individuals of a plant species in all sampling units}}{\text{Total Number of sampling units studied}}$$

$$\text{Abundance} = \frac{\text{Total number of individual plant species in all the sampling units}}{\text{Total number of sampling units of occurrence}}$$

Result and Discussion

A total of 21 climber species belonged to 20 genera of 14 families were recorded. 18 climber species were found to belong dicotyledonae and 03 to monocotyledonae (Fig-). Fabaceae was the dominant family consisting 05 species of 20 genera and 02 species each were recorded belonged to the family Dioscoreaceae Asclepiadaceae and Menispermaceae, while the minimum number of species (1) was recorded for 10 of the families like, Liliaceae, Vitaceae, Cucurbitaceae, Cuscutaceae, Sterculiaceae, Rubiaceae, Apocynaceae, Oleaceae, Celastraceae, Combretaceae and Brassicaceae. Out of 21 climbers, 18 were found as wild and 03 as both wild and cultivated (Table-1).

In present study one liana species *Bauhinia vahlii* Wight & Arn. was recorded, as in some of the reference the plant was included in climbers therefore in present investigation liana was not separated from the category of climbers and all the calculation were made as per the recorded number of climbers.

Distribution of Climbers

1. **% Frequency of Climbers:** % frequency was determined for 19 plant species in the range of 1% to 20%, 02 plant species in the range of 21% to 40% where as none of the plant species was in the range of 41% to 60%, 61% to 80% and 81% to 100%. The maximum % frequency 30% was calculated for *Combretum indicum* (L.) De Filippis and the minimum % frequency 4% for *Dioscorea daemona* Roxb. (Fig-1).
2. **Density:** Density was calculated for 11 plant species in the range of 0.00 to 0.35, 08 plant species in the range of 0.36 to 0.70, 01 plant species in the range of 0.71 to 1.05 and 01 plant species in the range of 1.06 to 1.4. The maximum density 1.40 was calculated for the plant species *Combretum indicum* (L.) De Filippis and the minimum 0.10 for the *Dioscorea daemona* Roxb. (Fig-1).
3. **Abundance:** Abundance was determined for 05 plant species in the range of 0.00 to 1.25, 03 plant species in the range of 1.26 to 2.50, 06 plant species in the range of 2.51 to 3.75 and 07 plant species in the range of 3.76 to 5.00. The maximum abundance 4.66 was calculated for the plant species *Combretum indicum* (L.) De Filippis and the minimum 0.12 for the *Citrullus colocynthis* Linn. Sehrad. (Fig-1).
4. **Relative Frequency:** The relative frequency was determined for 05 plant species in the range of 0.00 to 3.00, 09 plant species in the range of 3.10 to 6.00, 05 plant species in the range of 6.10 to 9.00 and 02 plant species in the range of 9.10 to 13.50. The maximum relative frequency 13.04 was determined for the plant species *Combretum indicum* (L.) De Filippis and the minimum 1.73 for *Dioscorea daemona* Roxb. (Table-1, Fig-2).

Table-1 : Phytosociological study of Climbers in Bhupdeopur Reserve forest area of district Raigarh

S. N.	Botanical Name	Local/Vernacular Name	Family	Habitat	% Frequency	Density	Abundance	Relative Frequency	Relative Density	Relative Abundance	Important Value Index
1	<i>Asparagus racemosus</i> Willd.	Shatawar	Liliaceae	Wild	8	0.40	2.64	3.47	4.50	4.69	12.66
2	<i>Atylosia scarabaeoides</i> (L.) Benth.	Latkana	Fabaceae	Wild	24	0.12	0.50	10.43	1.35	0.88	12.66
3	<i>Bauhinia vahlii</i> Wight & Arn.	Mahul	Fabaceae	Wild	9	0.25	3.00	3.91	2.81	5.33	12.05
4	<i>Butea superba</i> Roxb.	Palasbel	Fabaceae	Wild	10	0.28	2.80	4.34	3.15	4.97	12.46
5	<i>Celastrus paniculatus</i> Willd.	Malkangni	Celastraceae	Wild	11	0.29	2.64	4.78	3.26	4.69	12.73
6	<i>Cissampelos pareira</i> Linn.	Patha	Menispermaceae	Wild	5	0.20	1.20	2.17	2.25	2.13	6.56
7	<i>Cissus repanda</i> Vahl.	Panibel	Vitaceae	Wild	12	0.57	4.41	5.21	6.42	7.84	19.47
8	<i>Citrullus colocynthis</i> (L.) Schrad.	Indrayan	Brassicaceae	Wild	6	0.65	0.12	2.60	7.32	0.21	10.13
9	<i>Combretum indicum</i> (L.) De Philipps	Paibel	Combretaceae	Wild	30	1.40	4.66	13.04	15.78	8.28	37.10
10	<i>Cuscuta reflexa</i> Roxb.	Amarbel	Cuscutaceae	Wild	8	0.35	4.37	3.47	3.94	7.70	15.18
11	<i>Cryptolepis buchanani</i> Roem. & Schult.	Karanat	Asclepiadaceae	Wild	14	0.60	4.28	6.08	6.76	7.61	20.45
12	<i>Dioscorea daemona</i> Roxb.	Pashti	Dioscoreaceae	Wild/Cultivated	4	0.10	1.20	1.73	1.12	2.13	4.98
13	<i>Dioscorea pentaphylla</i> (L.)	Baralikand	Dioscoreaceae	Wild/Cultivated	6	0.14	2.33	2.60	1.57	4.14	8.31
14	<i>Gymnema R. Br.</i>	<i>sylvestre</i>	Gurmaraceae	Asclepiad-	Wild	6	0.30	1.40	2.60	3.38	2.48 8.46
15	<i>Helicteres isora</i> Linn.	Marorphali	Sterculiaceae	Wild	19	0.83	4.36	8.26	9.35	7.75	25.36
16	<i>Jasminum multiflorum</i> (Burm.f.) Andrews	Chameli	Oleaceae	Wild	10	0.40	4.00	4.34	4.50	7.11	15.95

S. N.	Botanical Name	Local/Vernacular Name	Family	Habitat	% Frequency	Density	Abundance	Relative Frequency	Relative Density	Relative Abundance	Important Value Index
17	<i>Momordica charantia</i> L.	Bankarela	Cucurbitaceae	Wild	7	0.20	2.28	3.04	2.25	4.05	9.34
18	<i>Mucuna pruriens</i> (L.) DC.	Kewanch	Fabaceae	Wild	14	0.55	3.92	6.08	6.20	6.97	19.25
19	<i>Pueraria tuberosa</i> DC.	Baralikand	Fabaceae	Wild	7	0.16	2.28	3.04	1.80	4.05	8.89
20	<i>Rubia cordifolia</i> Linn.	Manjita	Rubiaceae	Wild	5	0.54	0.45	2.17	6.04	0.80	9.01
21	<i>Tinospora cordifolia</i> (Willd.) Hook F. Thoms.	Giloy	Menispermaceae	Wild/Cultivated	15	0.54	3.60	6.52	6.04	6.40	18.96

5. **Relative Density:** Relative density was calculated for the 13 plant species in the range of 0.00 to 4.75, 07 plant species in the range of 4.76 to 9.50, where as none of the plant species was in the range of 9.51 to 14.25, while 01 plant species was in the range of 14.26 to 19.00. The maximum relative density 15.78 was determined for the plant species *Combretum indicum* (L.) De Filippis and minimum 1.12 for the *Dioscorea daemona* Roxb. (Table-1, Fig-2).
6. **Relative Abundance:** The relative abundance was estimated for the 05 plant species in the range of 0.00 to 2.50, 06 plant species in the range of 2.51 to 5.00, and 05 plant species in the range of 5.10 to 7.50, while 05 plant species were in the range of 7.50 to 10.00. The maximum relative abundance 8.28 was calculated for the plant species *Combretum indicum* (L.) De Filippis and the minimum 0.21 for *Citrullus colocynthis*(L.) Schrad. (Table-1, Fig-2).
7. **Important Value Index (IVI) of Climbers:** Important value index was calculated for 08 plant species in the range of 0.00 to 11, 11 plant species in the range of 11.10 to 22.00, 01 plant species in the range of 22.10 to 33.00 and 01 plant species in the range of 33.10 to 44. The maximum Important Value Index 37.10 was estimated for the *Combretum indicum* (L.) De Filippis and the minimum 4.98 for *Dioscoria daemona* Roxb. (Table-1, Fig-3).

Fig-1: Frequency, Density and Abundance of Climbers determined in Bhupdeopur Reserve forest area of district Raigarh.

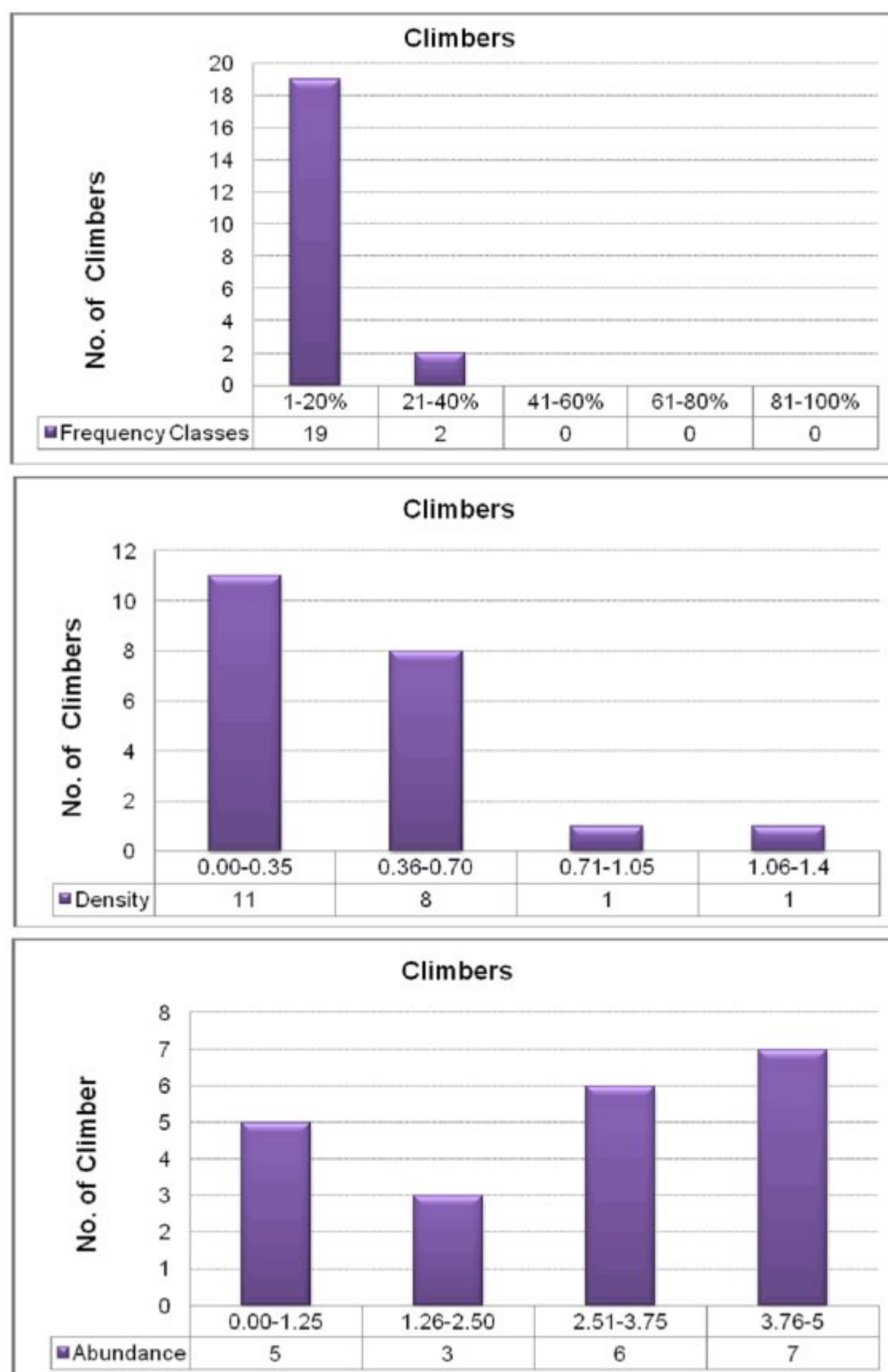


Fig-2: Relative Frequency, Relative Density and Relative Abundance of Climbers Determined in Bhupdeopur Reserve forest area of district Raigarh.

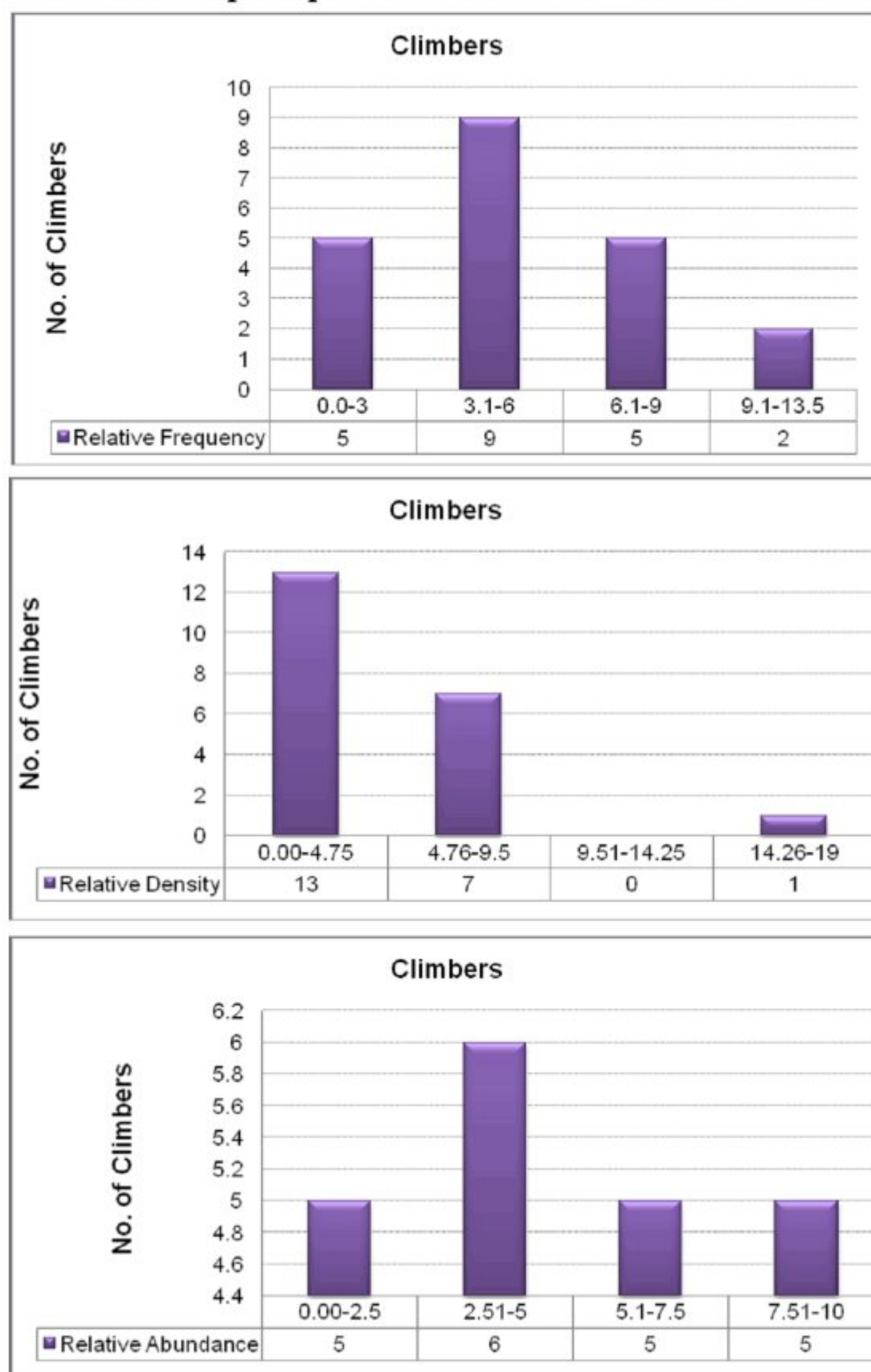
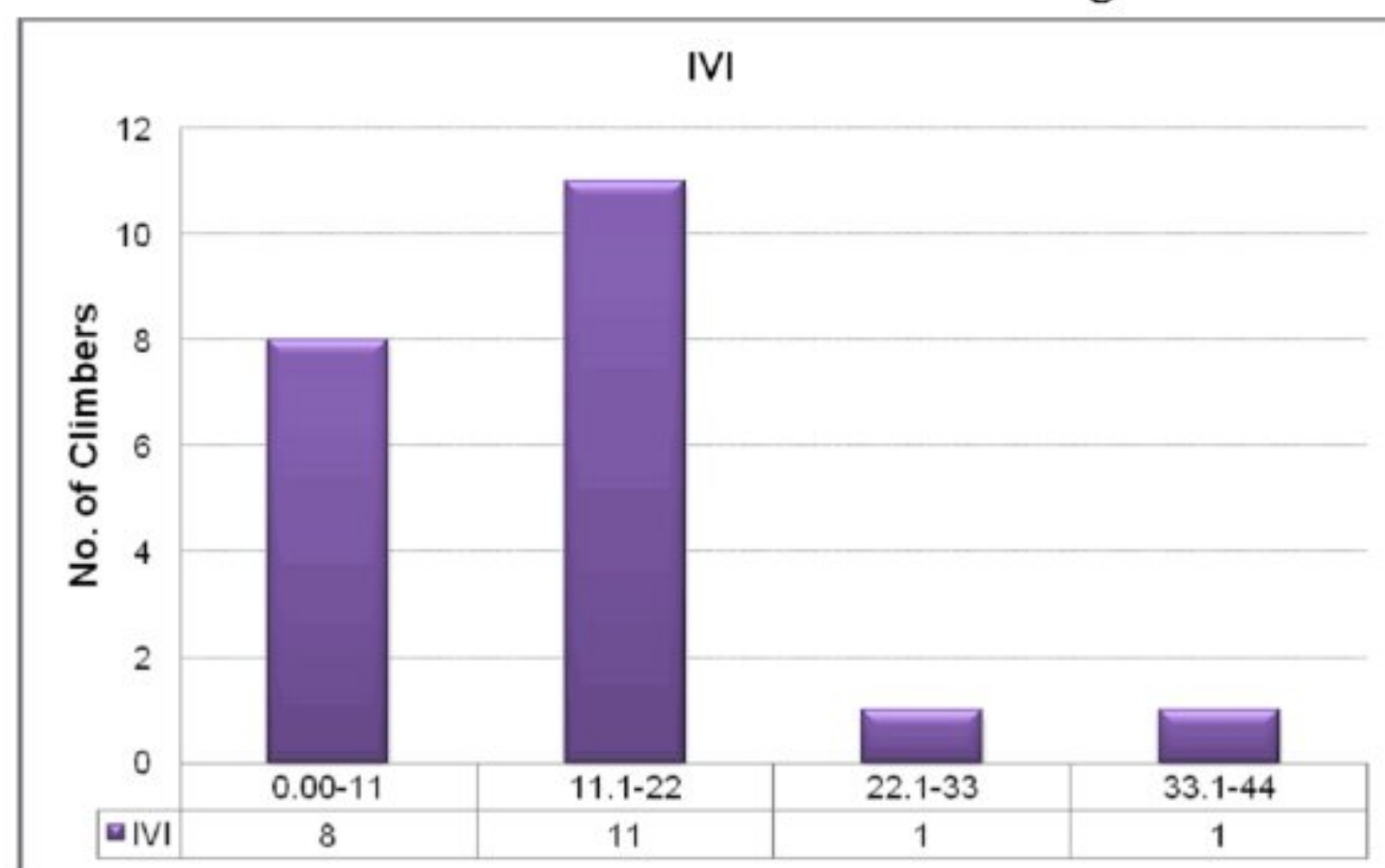


Fig-3: Important Value Index (IVI) of Climbers determined in Bhupdeopur Reserve forest area of district Raigarh.



Conclusion

The Phytosociological studies clearly indicate that Bhupdeopur Reserve Forest is an extremely important ecosystem by the virtue to richness of forest health and diversity of climber species. The species which are threatened need more attention and care.

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