ECOLOGICAL STUDIES OF SOME MEDICINAL PLANT SPECIES FROM SIDDHESHWAR SACRED GROVE OF PARNER, AHMEDNAGAR MAHARASTRA, INDIA

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ABSTRACT

Present study deals with the nature of ecological vegetation present in Siddheshwar sacred grove. For ecological study of the sacred grove 40 medicinal plant species were selected, which are used to treat various diseases/ailments by the local or tribal people. During study of selected plant species found in the sacred grove, Quadrate method was used. Quadrates of 100m x100m size were randomly laid to study the trees and shrub species while herbaceous species were studied by quadrates of 1m x 1m size randomly. Analytical characters such as Frequency, Density and Abundance are calculated with the help of formulae.

KEYWORDS: Sacred grove, Quadrate, Analytical characters, Ahmednagar, etc.

INTRODUCTION

A Sacred grove is a land segment containing dense vegetation having regional biodiversity, protected by local communities or tribal people in respect of the deity reside in that grove, this grove is locally called as 'Deorai.' Sacred groves are not only significant sites for regional biodiversity but also provide fundamental natural resources to local people. Some local people possessing indigenous knowledge about the plants, which are used as medicine in treating different diseases were consulted. The knowledge about distribution, habitat, demographic features and utility of these plant species are transmitted from one generation to other generation (Gadgil*et.al*: 1993). Sacred groves preserve useful plant species which are threatened and endemic due to over exploitation and rapid urbanization. For maintaining the biodiversity, ecological study of sacred grove is necessary. The numerical data gives focus on species, which are dominant in communities to know their dominance certain analytical

characters such as Frequency, Density and Abundance of species in a community are expressed in quantity by using quadrate method.

MATERIAL AND METHOD

The present study was carried out in the Siddheshwar sacred grove for knowing the ecological status of plant species. Quadrate method is used for determination of data. The total area of the sacred grove is 17.2 acres. The sacred forest region was divided into 5 quadrates randomly, 100m x 100m size of single quadrate taken for trees and shrub species and1m x 1m for herbaceous species. The data was collected during rainy season. No. of individual species in each quadrate are recorded and percentage frequency, density and dominance were determined as per Curtis and McIntosh, (1950).The plants are identified with the help of Flora of Ahmednagar district (Pradhan& Singh, 1999). Counted the number of individuals of each species occur in the quadrate. The frequency of individual species calculated.

Abundance and Density

Abundance of any species is expressed as a percentage of the total number of species present in community and therefore it is a relative measure. In sampling the abundance of species the individual of species are counted instead of just nothing their presence or absence was done while studying the frequency of a species.

Formulas used for calculating Frequency, Density and Abundance

Frequency (%) = Number of quadrates in which the species occurred X 100

　　　　　　　　　　　Total number of quadrates studied.

Density = Total number of individuals of a species in all quadrates

　　　　　　　Total number of quadrates studied.

Abundance = Total number of individuals of a species in all quadrates

　　　　　　　　Total number of quadrates in which the species occurred

Table 1: Observations.

Sr. no.	Botanical name of plant species	Individual in a quadrate					Total no of individuals in a quadrate	Total no of quadrates which species occurred	Density/Unit area	Abundance	Frequency%	Frequency Class
1	*Abitulon indicum* (L.) Sweet	6	-	7	7	-	20	03	4.0	6.6	60	C
2	*Albizia lebbeck* (L.) Bth.	1	-	-	-	3	04	02	0.8	2.0	40	B
3	*Acacia chundra* (Roxb. ex Rottle.) Willd.	-	-	3	-	4	07	02	1.4	3.5	40	B
4	*Acoruscalamus* L.	-	-	-	-	4	04	01	0.8	4.0	20	E
5	*Albizialebbeck* (L.) Bth.	-	2	-	-	-	02	01	0.4	2.0	20	E
6	*Amaranthus spinosus*L.	4	3	6	4	4	25	05	5.0	5.0	100	A
7	*Achyranthes aspera* L.	6	8	10	6	4	34	05	6.8	6.8	100	A
8	*Azadirachta indica*A. Juss.	6	7	-	4	4	21	04	4.2	5.2	80	D
9	*Bacopa monnieri* (L.)Penn.	4	-	-	-	-	04	01	0.8	4.0	20	A
10	*Barleria prionitis* L.	8	-	13	16	11	48	04	9.6	12.0	80	D
11	*Bauhinia variegata* L.	-	-	-	4	5	09	02	1.8	4.5	40	B
12	*Bridelia retusa* (L.) Spreng.	-	2	-	1	-	03	02	0.6	1.5	40	B
13	*Cucumis sativus* L.	-	-	4	-	2	06	02	1.2	3.0	40	B
14	*Cassia auriculata* L.	5	9	11	7	4	36	05	7.2	7.2	100	E
15	*Cassia occidentalis*L.	5	2	2	3	4	16	05	3.2	3.2	100	E
16	*Celastrus paniculata* Willd.	3	-	-	6	4	13	03	2.6	4.3	60	C
17	*Cissus quadrangularis* L.	4	-	5	3	-	12	02	2.4	6.0	40	B
18	*Citrullus colocynthis* (L.) Schrad.	-	-	-	6	-	06	01	1.2	6.0	20	A
19	*Clitoria ternatea* L.	4	-	6	3	-	13	03	2.6	4.3	60	C
20	*Cryptolepis buchanani* Roem. &Schult.	3	4	-	5	-	12	03	2.4	4.0	60	C
21	*Curculigo orchioides* Gaertn.	-	-	-	3	5	08	02	1.6	4.0	40	B
22	*Cynodon dactylon* Pers.	45	36	25	32	28	161	05	32.2	32.2	100	E
23	*Cymbopogon citratus* (DC.) Stapf.	3	-	-	-	-	03	01	0.6	3.0	20	A
24	*Datura metel* L.	5	7	3	-	4	19	04	3.8	4.7	80	D
25	*Enicostema axillare* (Lam.) Raynal	4	-	-	6	-	10	02	2.0	5.0	40	B
26	*Euphorbia hirta*L.	8	-	6	4	4	22	04	4.4	5.5	80	D
27	*Euphorbia tirucalli* L.	-	-	3	-	2	05	02	1.0	2.5	40	B
28	*Gmelina arborea* Roxb.	-	-	1	-	-	01	01	0.2	1.0	20	A
29	*Gloriosa superba*L.	-	-	-	-	4	04	01	0.8	4.0	20	A

30	*Gymnema sylvestre* (Retz.) R. Br. Ex Schult.	3	8	-	-	-	11	02	2.2	5.5	40	B
31	*Helicteres isora* L.	-	-	6	-	5	11	02	2.2	5.5	40	B
32	*Hemidesmus indicus* (L.) Schult.	-	-	-	4	-	04	01	0.8	4.0	20	A
33	*Lawsonia inermis* L.	-	-	3	-	-	03	01	0.6	3.0	20	A
34	*Melia azadirach* L.	-	-	-	3	-	03	01	0.6	3.1	20	A
35	*Mucuna pruriens* (L.) DC.	-	-	-	-	4	04	01	0.8	4.0	20	A
36	*Santalum album* L.	-	-	2	-	-	02	01	0.4	2.0	20	A
37	*Tephrosia purpurea* (L.) Pers.	3	3	5	-	2	13	04	2.6	3.2	80	D
38	*Terminalia bellirica* (Gaertn.) Roxb.	2	-	-	-	-	02	01	0.4	2.0	20	A
39	*Tridaxprocumbens* L.	13	9	7	11	8	48	05	9.6	9.6	100	E
40	*Tinospora cordifolia* (Willd.) Miers ex Hook. f. &Thoms.	-	-	-	2	-	02	01	0.4	2.0	20	A

On the basis of percentage values various species are distributed into five classes, according to Raunkiaer (1934).

Table 2: Raunkiaer's percentage values various species.

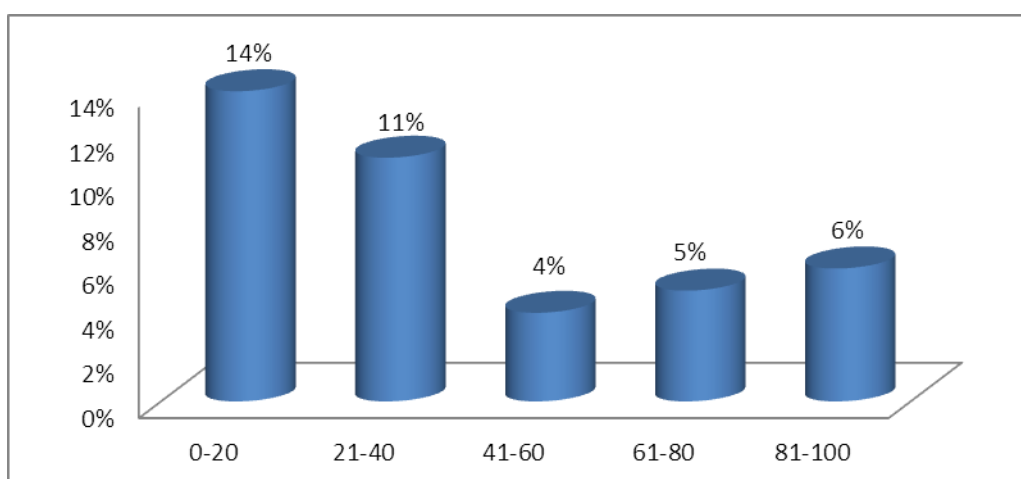| Sr. No.	Frequency of plants (in %)	Class
1	0-20	A
2	21-40	B
3	41-60	C
4	61-80	D
5	81-100	E

Fig 1: Frequency class and Frequency percentage and compare with Raunkiaer's value.

X-axis: Percentage of total number of species.

Y-axis: Frequency Classes.

Table 3: Percentage values various species.

Frequency class	Class Value	Raunkiaers value	Frequency class Vegetation
A	0-20	53	14%
B	21-40	14	11%
C	41-60	09	04%
D	61-80	08	05%
E	81-100	16	06%

CONCLUSION

The Frequency value refer to the values of Raunkiaer's formula A>B>C<D<E. The present study shows the frequently occurring species and dominating species found in this sacred grove.The present ecological study of medicinal plant species shows that the given vegetation is heterogeneous in nature.

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