Volume: 4 Issue: 8 Pages: 11-22

Study of Floristic Diversity of Sacred Grove from Devrai, Lanja Tal: Lanja Dist: Ratnagiri

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Article Info.
E-ISSN: 2583-6528
Impact Factor (SJIF): 6.876
Peer Reviewed Journal
Available online:
www.alladvancejournal.com

Received: 08/July/2025
Accepted: 04/Aug/2025

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Abstract
Sacred groves are large vegetative areas rich in biodiversity protected by communities living around them, often harboring some religious and cultured importance. The forest conserved in the name of god and considered to be sacred is called as sacred grove these are in fact 'Sanctuaries' conserved by the society and not by the government forest department. Traditional knowledge has been used for centuries by indigenous local communities to manage natural resources under local laws, customs and traditions. The Value of Simpson's D ranges from 0 - 1, with 0 representing infinite Diversity and 1 representing No Diversity, So the Larger value of D Lower the Diversity. For this reason, Simpson's Index is often as its compliment (1 - D). As per my observation of Monsoon, winter and Summer Biodiversity in my study area, The Simpson's Index D shows Less Value of Biodiversity in summer season and Greater value of Biodiversity in Monsoon Season.

Keywords: Sacred Groves, Lanja, Devrai, Simpson Diversity Index.

Introduction

Sacred groves are large vegetative areas rich in biodiversity protected by communities living around them, often harboring some religious and cultured importance. The community designates a forest area as protected and to enforce the protection declares it sacred usually by dedicating it to a deity in such groves, all forms of vegetation, including shrubs and climbers, belongs to the deity.

The forest conserved in the name of god and considered to be sacred is called as sacred grove these are in fact 'Sanctuaries' conserved by the society and not by the government forest department. As it has been conserved in the name of god, it has special protection. These clusters of thick forest are present not only in Western Ghats of India but in the entire country, more than 13000 Sacred Groves have been reported in India. According to rules and regulations, about environmental conservation and protection protecting rare species and establishing national parks and Sanctuaries plays important role in conservation of biodiversity as well as declaring some regions as bio-reserves is very important for conservation of nature. The important point in that is maintaining traditional knowledge and use it for new ideas for balancing nature of environment. Traditional knowledge has been used for centuries by indigenous local communities to manage natural resources under local laws, customs and traditions.

The Sacred groves in Western Ghats are small patches of ancient forest dedicated to local amnestying deities. These groves are a rich source of fruit bearing trees and small water bodies and act as habitat for several birds and reptiles. The western ghat of India is one of the 34 globally important biodiversity hot spots. In 2006 the Western Ghats were proposed as a protected world heritage site.

In the villages in which groves are protected regionally relevant folk knowledge supports traditional conservation practices. Local people have evolved their own rules and maintain groves.

- In Maharashtra there are 2820 groves situated in districts Pune, Ratnagiri, Raigad, Kolhapur, Sindhudurg, Ahmednagar and Thane.
- Pune-There are Sagdara and Navalaichi rai are two distinct groves.
- Ratnagiri-out of 2837 sacred groves documented for Maharashtra.

- Ratnagiri district has 830 groves.
- Raigad-In Roha taluka there is famous sacred grove named Pahur.
- Thane-In thane dist., in Jawhar taluka the sacred groves are protected by fear of Tiger.
- Sindhudurg-there are one or two sacred groves in some villages.
- Kadoba, Dungoba are famous Devrai from all.

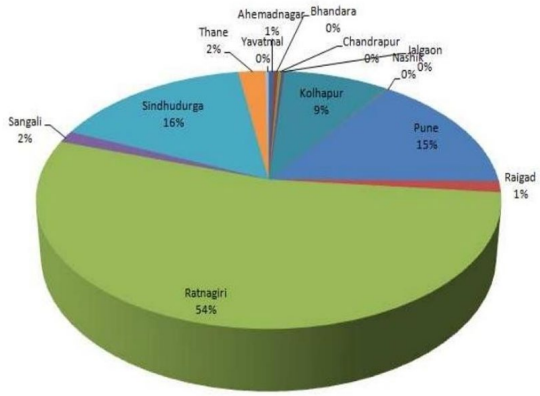

Fig 1: Enumeration of Sacred Groves in Maharashtra State

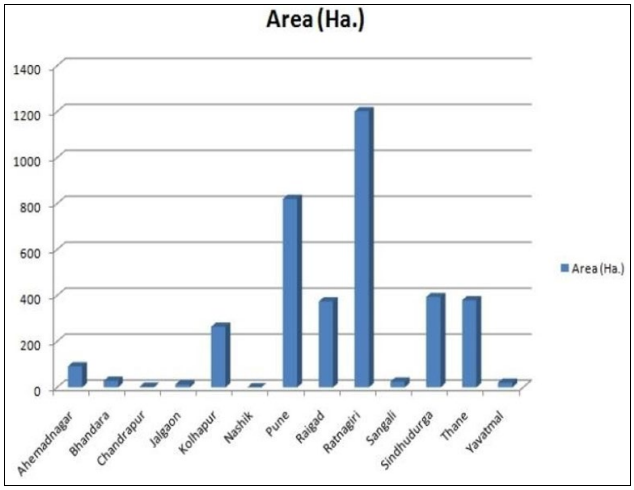

Fig 2: Area wise distribution of SGs in Maharashtra State

History of Sacred Groves

People believed that trees were the place of God or that they had spirit so they protected them gradually, it became a ritual among the tribal that if they hunt or cut trees in these areas, God will become angry and it will lead to disaster or cause diseases or damage crops.

Table 1: List of Taluka wise Total Sacred Groves (SGs) Reported from Ratnagiri district

S. No.	Name of Taluka	No. of SGs
1	Chiplun	108
2	Ratnagiri	83
3	Dapoli	4
4	Mandangad	1
5	Sangameshwar	87
6	Lanja	198
7	Rajapur	349
8	Khed	.
9	Guhagar	.
Total		830

Indian Sacred groves have prevedic origin. Most of them are associated with indigenous / tribal communities who mostly believe in divinity of nature and natural resources. Therefore distinctly different from icon oriented main stream religions. Historically Sacred groves find their mention in Hindus, Jain and Buddhist texts.

About the Study Area

- Lanja Sacred grove Devrai wadi
- Latitude 16°51'48.2"N, Longitude 73°31`27.4"E.
- It is located near Lanja city in the distance of 5 -6 kilometers.
- Deity of that grove is Devi Bharadidevi
- Area: 8 Ha.
- Distribution of various plants is there from that 35 species we found in that area.
- From those species we study about 18 flowering plants which are found in summer, rainy and winter season also I study about their local uses.

Aims and Objective

The Present topic of Project is undertaken by keeping the aim and objectives as-

- To study floristic diversity of sacred grove local people for further.
- Prepare study of Sacred Grove.
- To explore the number of floristic species present in Lanja-Devrai Sacred grove
- To give importance to Sacred Grove for biodiversity balance and conservation.
- To spread awareness about protection of plants as well as Sacred Groves for nature's beauty.

Review of Literature

M. Amirthalingan in 2016, in International journal current Research in Biosciences and plant Biology published about se in Maharashtra that-In Maharashtra she are found in tribal as well a nontribal areas. The sacred groves in the western part are called Devrai or Devrahati, whereas in the eastern part of the Madiya tribal call it Devgudi. A total of 2820 Sacred Grove have been documented in Maharashtra (Deshamukh 1991) Maruti, Vaghoba, Vira, Bhiroba, Khandoba and Shirkai are some of deities to whom these groves are dedicated. Sacred grove form an important landscape feature in the deforested hill ranges of Western Ghats of Maharashtra.

Pallavi P. Borate and Meena S. Raw published in 2018 article named Floristic diversity of Sacred Grove in Kudap village in Ratnagiri District in Maharashtra. The healers were found to be reluctant for providing information about methods of preparation of medicines Some Spices from Euphorbiaceae, Lamiaceae are present. Some parasites were present on host like Magnifera.

The preliminary study showed presence of good enough floristic diversity in village. Some plant species Round are economically and medicinally important.

Shilpa Baidya, Bijay Thakur and Ashalata Devi Published in January 2020 - Karbi community by and large utilized several medicinal plants for treatment of various health ailments. The study also revealed that relationship between Plants found in sacred groves and Karbi tribe is not limited and is essential part of their health security People inhabited near Sacred Groves collect and use different plant species for the treatment of their various health problems.

Kartik Chandra Guchhait, Parmind Kesarwani, Sanjeet Kumar Published in 2023 in their article Sacred grove in India: Medicinal plants and association - Sacred grove preserve a rich religious and socio cultural heritage of Indian biodiversity from primeval times due to their values. They Acts as bridge between man and nature. Groves help to Improve soil quality, replenish water resources and are pivotal for biodiversity conservation of plants and animals including rare, endemic rand ethnobotanical species. Numerous plant species from Sacred Groves are used according to tradition and culture to prevent or cure various health problems.

Shonil A Bhagawat and Claudia Rutte published in 2006 in their article sacred grove potential for biodiversity management - Natural Sacred sites could play an important role in community-based conservation of biodiversity and should therefore be included in conservation strategies however these traditional Institutions are currently facing new threats that need to be recognized by scientists as well as practitioner. The nature and extent of these threats vary from nation to nation and even regionally or by site.

Uday Kumar Sen, in article Ecology: Current research in 2021 concluded that Sacred grove were originally developed to fulfill indigenous peoples religious and spiritual needs, they play Important role in conserving in-situ biodiversity. People must remain in the hands of future management. Factors such as tourism, income and job development will play an important role in the future protection of Sacred Groves and their potential for the conservation of biodiversity.

In the words of Botanists in M. Gadgil and V. D. Vartak (2002), Sacred Groves are tracks of the most valuable of legacies from the primitive practices of nature conservation.

Sacred groves are tracts of sacred forests which have been completely or nearly completely immune from human interference on grounds of religious beliefs.

A Sacred grove is a patch of vegetation vangina in extent from a few trees to forty hectares or more, which is left undisturbed because of its association with some deity. In its original form, this protection forbade any interference with the biota of the grove whatever and not even leaf litter was removed from it, nor was grazing or hunting permitted within the grove. Even when the protection has become less stringent, any removal of livelihood continue to be taboo. The groves therefore represent a sample of the vegetation in its climax state.

Materials and Methods

Study area: The study area is village from Lanja Taluka in Ratnagiri District. Field visits were made in different Seasons and Sacred groves observations noting down. Study of area has been sampled for floristic plant species. A qualitative and quantitative assessment of study area has been carried out by random sampling method. The plant materials collected hat been observed by standard tools. The RET (Rare, Endangered and Threatened) Species of plants has been identified.

During the investigation of sacred groves efforts were also made to understand plants. Along with this data interaction between many endemic floristic plants documented by photography Diversity of Plant species were calculated by Simpson diversity Index. For this quadrates of 10 m. x 10 m. were plotted randomly. Name of plant species in each quadrate were noted and number of respective plant species in each quadrats were also noted. In total 5 quadrate were taken for the present side under study. Simpson diversity Index were calculated using Formula

Simpson Diversity Index

$$D = 1 - \left(\frac{\Sigma\, n(n-1)}{N(N-1)} \right)$$

n = The Total Number of individual of a species.
N= Total Number of individuals of all species.

Observations

List of Lanja Taluka Sacred Groves

S. No.	Nearest Village	Area (Ha.)	Deity	S. No.	Nearest Village	Area (Ha.)	Deity
1)	Adavali	0.22	-	15)	Ambode	1.98	
2)	Adavali	1.62	-	16)	Ambode	0.31	
3)	Adavali	1.04	-	17)	Anjnari	1.03	
4)	Adavali	0.09	-	18)	Anjnari	0.15	
5)	Adavali	0.49		19)	Anjnari	0.11	
6)	Agave	0.5	Mhasoba	20)	Beni Khurd	1.5	
7)	Agave	0.3		21)	Beni Khurd	1.21	
8)	Agave	0.12		22)	Bhambed	2.81	Laxmi
9)	Asage	1.26		23)	Bhambed	0.4	Adhishthi devi
10)	Argaon	4.09	Kedarling	24)	Bhambed	0.06	
11)	Argaon	0.95		25)	Bhambed	0.18	
12)	Asage	0.26		26)	Bhambed	4.73	
13)	Asage	0.75		27)	Bhambed	0.8	
14)	Ambode	0.04		28)	Bivali	1.27	

29)	Bivali	2.79		60)	Isavali	1.65	
30)	Borivale	0.83		61)	Isavali	1.09	
31)	Borivale	1.38		62)	Indavati	1.59	
32)	Borivale	1.09		63)	Irche	0.11	
33)	Borthade	0.15		64)	Irche	0.4	
34)	Borthade	2.54		65)	Irche	0.87	
35)	Borthade	1.21		66)	Kanagavali	1.17	
36)	Borthade	0.49		67)	Kante	0.5	
37)	Borthade	1.15		68)	Kante	0.3	Kaloba
38)	Devdhe	1.98		69)	Kante	0.3	Sankeshwar
39)	Devdhe	0.35		70)	Kante	0.1	
40)	Dhundare	0.28		71)	Karle	1.07	
41)	Gavane	7.12	Raghoba	72)	Karle	1.35	
42)	Gavane	0.65		73)	Kelambe	1.86	
43)	Golavashi	5.43	Naga Devi	74)	Khanavali	0.49	
44)	Govil	1.21		75)	Khanavali	1.57	
45)	Govil	4.25		76)	Khavadi	3.32	Jaka Devi
46)	Hardakhale	0.4		77)	Khavadi	3.55	Kurkhai Devi

S. No.	Nearest Village	Area (Ha.)	Deity	S. No.	Nearest Village	Area (Ha.)	Deity
47)	Hardakhale	0.4		78)	Khavadi	4.34	Navala Devi
48)	Hardakhale	0.77		79)	Khervase	1.26	
49)	Hardakhale	9.96		80)	Khervase	0.24	
50)	Hardakhale	0.16		81)	Kolhewadi	1.6	
51)	Hardakhale	0.19		82)	Khorgaon	1.07	
52)	Hardakhale	9.23		83)	Khorninko	7.49	
53)	Hardakhale	0.03		84)	Khorninko	3.76	
54)	Kanagavali	2.93		85)	Kochari	1.82	
55)	Hasol	1.38		86)	Kochari	0.49	
56)	Hasol	0.87		87)	Kochari	0.26	
57)	Hasol	0.1		88)	Kochari	0.61	
58)	Hasol	1.42		89)	Kondgaon	0.24	
59)	Hasol	2.1		90)	Kondye	6.17	Ravalnath
91)	Kondye	0.32		124)	Padvan	0.26	
92)	Kondye	0.05		125)	Padvan	0.16	
93)	Korle	0.06		126)	Padvan	0.12	
94)	Korle	0.2		127)	Padvan	0.32	
95)	Kot	0.22	Vajreshwari	128)	Padvan	0.06	
96)	Kurne	0.49		129)	Palu	3.64	
97)	Kurne	0.42		130)	Palu	0.45	
98)	Kurne	1.73		131)	Palu	0.16	
99)	Kurne	1.51		132)	Palu	1.0	
100)	Kurne	0.91		133)	Palu	7.81	
101)	Kurne	2.97		134)	Panhale	0.24	
102)	Kurne	1.37		135)	Panhale	0.06	
103)	Kelambe	0.03		136)	Panhale	0.2	
104)	Kurang	0.5		137)	Panhale	0.24	
105)	Kurang	1.21		138)	Panhale	0.08	
106)	Kurang	0.06		139)	Panhale	0.27	
107)	Kurchumb	0.8	Nageshwar	140)	Panore	0.65	
108)	Kurchumb	0.2	Mhasveshwar	141)	Prabhanvalli	27.4	Gangoba
109)	Kurne	0.53		142)	Prabhanvalli	2.87	Umbareshwar
110)	Kurne	3.18		143)	Punas	5.58	Chandika
111)	Lanja	5	Bharadi Devi	144)	Punas	0.2	
112)	Lanja	1.01		145)	Punas	0.8	Vitthala Devi

113)	Machal	2	Nateshwar	146)	Punas	0.5	Vardanidevi
114)	Majal	0.04		147)	Roon	1.38	
115)	Majal	0.4		148)	Roon	1.31	
116)	Majal	0.18		149)	Roon	1.13	
117)	Majal	2.19	Navala Devi	150)	Roon	0.21	
118)	Majal	0.16		151)	Ringane	1.69	
119)	Majal	0.18		152)	Ringane	0.85	
120)	Math	0.89		153)	Ringane	0.25	
121)	Nandavali	0.35		154)	Salpe	10.9	
122)	Nioshi	0.22		155)	Satavali	0.08	
123)	Padvan	0.16		156)	Shiposhi	0.74	
157)	Shiposhi	0.53		178)	Vangule	4.37	Satyashwar
158)	Shiposhi	0.55		179)	Veral	0.77	-
159)	Shiravali (Varachi)	0.1		180)	Veral	1.03	-
160)	Shiravali (Varachi)	4.49	Gango	181)	Veravali BK	2.59	Kedarling
161)	Shiravali (Varachi)	1.46		182)	Veravali BK	1.9	-
162)	Shiravali (Varachi)	0.54		183)	Veravali Kd	2.83	Navala Devi
163)	Shiravali (Varachi)	0.11		184)	Vhel	0.12	-
164)	Talavade	1.15		185)	Vhel	0.1	-
165)	Talavade	0.16		186)	Vhel	3.72	Jugai
166)	Upale	0.8	Someshwar	187)	Vilavade	0.12	-
167)	Upale	1.05	Nateshwar	188)	Vilavade	4.63	Mahadev
168)	Vadgaon	0.16		189)	Vilavade	2.78	Kedarling
169)	Vadgaon	7.74		190)	Yeravade	0.32	-
170)	Vadgaon	0.98		191)	Yeravade	0.58	-
171)	Vaghagaon	0.12		192)	Yeravade	0.36	-
172)	Vaghagaon	0.28		193)	Yeravade	0.53	-
173)	Vaghagaon	0.24		194)	Zapade	0.26	-
174)	Vaghagaon	0.08		195)	Zapade	0.42	-
175)	Vaked	4.44	Adhishthita Devi	196)	Zapade	0.06	-
176)	Vaked	0.41		197)	Zapade	0.12	-
177)	Vaked	0.17		198)	Zapade	0.1	-

Habit Wise Floristic Species Composition of Ratnagiri District

S. No.	Habit Wise Composition	No. of Species	Percentage
1	Bulbous Herb (BH)	10	3
2	Climber (Cl)	17	5
3	Epiphyte (E)	12	4
4	Herbs (H)	106	34
5	Liana (L)	5	2
6	Parasite (P)	3	1
7	Scandent Shrub (SS)	30	10
8	Shrub (S)	41	13
9	Tree (T)	86	28

Plants available in Lanja Devrai

S. No.	Name Of Plant	Family	Common Name	Habit
1.	Abrus precatorius L.	Fabaceae	Gunj	Cl
2.	Acacia auriculiformis A. Cunn	Mimosaceae	Australian Babhul	T
3.	Achyranthus aspera L.	Amaranthaceae	Aghada	S
4.	Adhathoda vasica L.	Acanthaceae	Adulasa	S
5.	Albizia lebbeck Benth	Mimosaceae	Kinhai	T
6.	Alstonia scholaris (L)R.Br.	Apocynaceae	Satvin, Saptaparni	T
7.	Ampelocissus tomentosa (Planch)	Vitaceae	-	SS

8.	Anacardium occidentale L.	Anacardiaceae	Kaju	T
9.	Arthraxon lanceolatus Hotst	Poaceae	-	H
10.	Arundinella ciliate Neesex. mia	Poaceae	-	H
11.	Arundinella leptochloa (Neesex Steud)	Poaceae	-	H
12.	Arundinella metzi Hochst	Poaceae	-	H
13.	Artocarpus heterophyllus Lamk.	Moraceae	Phanas	T
14.	Artocarpus lakoocha Roxb.	Moraceae	Lakooch	T
15.	Bombax ceiba (L)	Bombacaceae	Katesavar, Shevari	T
16.	Brassica juncea Hook	Brassicaceae	Mohari	H
17.	Butea monosperma (Lamk.) Jaub	Fabaceae	Palas	T
18.	Cassia fictula L.	Caesalpiniaceae	Amaltas Bahava	T
19.	Centella asiatica (L) Urban	Aplaceae	Manduk Parni	H
20.	Ficus religiosa (L)	Moraceae	Pimpal	T
21.	Garnicia indica (Thou) choisy	Clusiaceae	Kokam,Amsul	T
22.	Gloriosa superba L.	Colchicaceae	Kalalavi Agnishikha	Cl
23.	Impatiens balsamina L.	Balsaminaceae	Terada	H
24.	Leea indica (Burm. F.) Merr.	Leraceae	Dinda	S
25.	Mucuna pruriens (L) DC	Fabaceae	Khaj Khujali	Cl
26.	Neolarkia cadamba (Roxb) Bosser	Rubiaceae	Kadamba	T
27.	Smithia bigemina Dalzell	Fabaceae	-	S
28.	Sterculia urens Roxb.	Sterculiaceae	Karaya bhutya	T
29.	Strychnous nux- vomica L.	Loganaceae	Kajara	T
30.	Terminalia Arjuna (Roxb)	Combretaceae	Arjun	T
31.	Terminalia bellerica	Combretaceae	Behada	T
32.	Terminalia chebula	Combretaceae	Hirada	T
33.	Terminalia paniculata Roth	Combretaceae	Kinjal	T
34.	Zanthoxylum rhetsa	Rutaceae	Chirphal	T
35.	Ziziphus rugosa Lam.	Rhamnaceae	Toran	SS

Common Species Found in Lanja Devrai

Abrus Precatorius (Gunja): Season - Wet Season Family- Fabaceae.

It is commonly known as Gunja and abundantly found all throughout the plains of India. This plant is having medicinal potential to cure various diseases. Plant have been reported for neuromuscular effects, anti-malarial, ant diabetic effect etc.


Habit


Flowers


Fruits

Achyranthes Aspera (Aghada): Season-June Family: Amaranthaceae

Perennial herb up to 1.2 m tall.

Used in treatment of boils, asthma, in bleeding, bronchitis, cold, Cough, dog bite, snake bite and skin diseases.


Habit


Inflorescence


Flowers

Adhathoda Vasica: Season - Feb-April
It is shrub with opposite ascending branches. The plant has been used in the Indigenous system of medicine in India for near about 2500 years
Uses - against headache, colds, cough, Fever, asthma, chronic bronchitis and diarrhea.


Habit **Flowers**

Albizia Lekheck Benth (kinhal): Season - Septemeber-October The wood is termite resistant and can be used for furniture, general construction, firewood and charcoal. The tree can be planted for shade, erosion control and as an ornamental.



Habit **Flowers** **Fruits**

Alstonia Scholaris (L) (Satvin): Season - March-July
Used in folk medicines for the treatment of diarrhea, dysentery, malaria, fever and cardiac as well as aspiratory problems.



Habit **Flowers** **Fruits**

Arthraxon Lanceolatus Hochst:
Season - Annual, Dry Tropical
An annual grass with prostrate Stems up to 20-60 cm long, nodes hairless or hairy.


Habit **Flowers**

Brassica Juncea Hook (Mohari): Season - Early spring, to late summer
It is used in preparation of soaps, hair oil, paints and as condiment in pickle. Used in phytoremediation to remove heavy metals such as lead from the soil in hazardous waste sites.


Habit


Flowers

Butea Monosperma (Lamk) (Palas): Season - February-April
The seeds are used for skin ailment, keratitis, piles, urinary discharges and diseases of the brain eye, head and skin.


Habit


Flowers


Fruits

Centella Asisatica (Mardukparni): Season - Monsoon
It is widely used as a blood purifier as well as for treating high blood pressure for memory enhancement and promoting longevity.


Habit


Flowers


Fruits

Gloriosa Superba (Kalalawi): Season - mid summer
It is used to cure arthritis, gout, rheumatism Inflammation ulcers, bleeding piles, skin diseases, leprosy, impotency, snake bit e.


Habit


Flowers


Fruits

Impatiens Balsamina L. (Terada): Season - Late spring to fall.
It is prescribed for the treatment of rheumatism lsthmus, generalised Pain, fractures, inflammatim of nails, dysentry, Foot diseases.

Habit **Flowers** **Fruits**

Leea Indica (Dinda):
Season - evergreen July to September
It is used for treating body pains, cuts, fever, skin complaints, Vertigo, wounds.

Habit **Flowers** **Fruits**

Mucuna Pruriens (L) (Khajkhujali): Season - Wet Season
It is Herbal drug used for the management of male infertility, nervous disorders and also as an aphrodisial.

Habit **Flowers** **Fruits**

Neolarkia Cadamba (Kadamba): Season - Monsoon
It is used in treatment of fever, uterine complaints, blood diseases, skin diseases, tumor, anaemia, eye inflammation and diarrhea.

Habit **Flowers**

Terminalia Arjuna (Arjun): Season - January-March Bark is used in anginal pain, hypertension, congestive heart failures.



Habit **Flowers** **Fruits**

Terminalia Chebula (Hirada):
Season - May-June and Fruit in November-March It is used in oral ulcers, sore throat, its powder is good astringent in loose gums, bleeding and ulceration in gums.



Habit **Flowers** **Fruits**

Zanthoxylam Rhetsa (Chirphal): Season – Evergreen, June-July It is used in diabetes, toothache and diarrhea.



Habit **Flowers** **Fruits**

Ziziphus Rugosa (L) (Toran): Season - January-April It is used for the treatment of diarrhea, ulcer, skin diseas, cough, hypertension.



Habit **Flowers** **Fruits**

(Pohot Sources Personal and Internet)

Observation Table and Calculation

Monsoon

S. No.	Name of Species	No. of Individuals (n)	n-1	n(n-1)
1	Achyranthus aspera L.	5	4	20
2	Brassica juncea	6	5	30
3	Centella asiatica	15	14	210
4	Impatiens balsamina L.	16	15	240
5	Leea indica (Burm. F.) Merr.	6	5	30
6	Mucuna pruriens (L) DC	2	1	2
7	Neolarkia cadamba (Roxb)	2	1	2
8	Zanthoxylum rhetsa	2	1	2
Total		54	46	536

S. No.	Quadrate No.					Total
	1	2	3	4	5	
1	1	1	1	1	1	5
2	-	-	2	2	2	6
3	4	3	1	2	5	15
4	4	2	4	4	2	16
5	1	2	1	1	1	6
6	-	1	1	-	-	2
7	-	-	1	1	-	2
8	-	1	-	-	1	2
Total	10	10	11	11	12	54

n = the no. of individuals & each species.
N= Total No of individuals of all species.

Therefore,

$$D = 1 - \frac{536}{2862}$$

D = 1 - 0.187
D = 0.813

Winter

S. No.	Name of Species	No. of Individuals (n)	n-1	n(n-1)
1	Albizia lebbeck Benth	2	1	2
2	Arthraxon lanceolatus Hotst	20	19	380
3	Terminalia Arjuna (Roxb)	2	1	2
4	Abrus precatorius L.	4	3	12
5	Butea monosperma	3	2	6
6	Terminalia Chebula	2	1	2
7	Brassica juncea	7	6	42
	TOTAL	40	33	446

S. No.	Quadrate No.					Total
	1	2	3	4	5	
1	1	-	-	-	1	2
2	5	6	5	2	2	20
3	1	-	-	-	1	2
4	1	1	1	1	-	4
5	-	1	-	1	1	3
6	-	1	1	-	-	2
7	-	2	2	3	-	7
Total	8	11	9	7	5	40

$$D = 1 - \frac{446}{1560}$$

D = 1 - 0.285
D = 0.715

Summer

S. No.	Name of Species	No. of Individuals (n)	n-1	n(n-1)
1	Gloriosa superba	2	1	2
2	Ziziphus rugosa (L)	17	16	272
3	Alstonia scholaris (L)	1	0	0
4	Adhathoda vasica L	4	3	12
Total		24	20	286

S. No.	Quadrate No.					Total
	1	2	3	4	5	
1	1	-	1	-	-	2
2	6	5	2	2	2	17
3	-	-	1	-	-	1
4	1	1	1	-	1	4
Total	8	6	5	2	3	24

$$D = 1 - \frac{286}{552}$$

D = 1 - 0.518
D = 0.482

Results and Conclusion

The Value of Simpson's D ranges from 0 - 1, with 0 representing infinite Diversity and 1 representing No Diversity, So the Larger value of D Lower the Diversity. For this reason, Simpson's Index is often as its compliment (1 - D) As per my observation of Monsoon, Winter and Summer Biodiversity in my study area, The Simpson's Index D shows Less Value of Biodiversity in Summer season and Greater value of Biodiversity in Monsoon Season.

Urban Vanrai/Groves: Benefits

- Maintaining and increasing greenery of certain areas.
- It may have fruits medicinal evergreen and rare trees and endemic species of birds or animals.
- Maintain temperature and water tables of the area and protect water bodies like ponds and lakes.
- Local threatened biodiversity and flora Fauna get secured and it flourish due to Vanrais.
- Devrai's become Centers for community activity and unite different communities together.
- Sacred groves are leading the local people into movement towards conservation.
- Give the feel of dense forest in the concrete Jungle.

Traditional Uses

One of the most important traditional uses of sacred groves was that it acted as a repository for Various Ayurvedic medicines. Other uses involved a source of replenishable resources like fruits and honey. In most sacred groves it was taboo to hunt or chop wood. The vegetation cover helps reduce soil erosion and prevents desertification as in Rajasthan. The groves are often associated with ponds and streams and meet water requirements of local people.

Modern Uses

In modern times, sacred groves have become biodiversity hotspots on various species seek refuge in the areas due to progressive habitat destruction and hunting elsewhere. Sacred groves often contain plant and animal sps. That have become extinct in neighboring areas. They therefore harbor great genetic diversity. Besides this, sacred groves in urban landscapes acts as lungs to the city as well providing much needed vegetation cover.

Threats

Threats to the grove include Urbanization over exploitation of resources like overgrazing and excessive firewood collection and environmental destruction due to religious practices. Other threats to the sacred groves include invasion by invasive species.

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