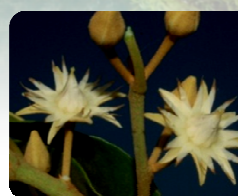
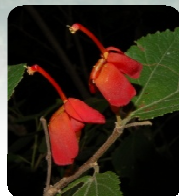


**Report of
UGC Sponsored
Major Research Project
(MRP)**



**An Enumeration of Floristic Diversity of Coastal Sacred Groves to
Understand Animal-Plant Interrelationship in Ratnagiri District of
Maharashtra State**



**Submitted to
University Grants Commission
(UGC), New Delhi**

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SUMMARY

One of the traditional methods to conserve biodiversity is a selected forest as 'Sacred Grove (SGs)'. These sacred groves serve as natural habitats of rare, endemic, endangered and wild varieties of some economically important organisms and rare faunal elements. Though it is comparatively a smaller habitat, we can consider it as micro-level biodiversity hotspot. Low altitude lateritic plateaus are common landmass in Konkan region especially in Ratnagiri district. The SGs on lateritic plateaus represents the kind of ancient biodiversity existing in Konkan region from thousands of years.

So far Ratnagiri district is concern, about 830 SGs has been recorded by Deshmukh in 1998 and visited about 17 SGs. A total of 1202.6 hectares area in Ratnagiri has been occupied by SGs which seems to be the largest and regarded as 'Hot Spots' of SGs in Maharashtra state. Sacred groves from coastal lateritic plateau area are remain neglected from floral and faunal diversity is concerned. An extensive floristic and faunal survey of 27 selected sacred groves have been carried out during the period of 2012 to 2015. In the present investigation, we have conducted detailed analysis of floristic diversity, ethnobotanical data analysis, ecological survey and plant-animal inter-relationship in different sacred groves located in coastal lateritic plateaus of Ratnagiri district.

The study reveals the occurrence of 306 plant species from 86 families consisting 106 sp. of herbs, 86 sp. of trees, 41 sp. of shrubs, 30 scandent shrubs, 17 sp. of climebrs, 12 sp. of epiphytes; 10 sp. of bulbous herbs including 5 lianas and 3 sp. of parasites out of these about 40% species are found to be endemic and restricted to plateaus only. Efforts were also made to understand ethnobotanical information of Rare, Endangered and Threatened (RET) plants of the study area and recorded the important data of 78 RET species with their traditional utilization.

During the investigation 56 bird species, 15 mammal species, 26 reptiles and 06 amphibians and 128 insect species have been reported. Along with this two papers are communicated for publication. In present investigation two Endangered taxa viz., *Brachystelma malwanense* S.R. Yadav & N.P. Singh and *Gymnema khandalense* Santapau were recorded from study area are analysed to understand AM association. The observations taken on animal- plant interactions will help ecologist and scientific community to understand the exact relationship in plant and animals. In microhabitats of such lateritic plateaus a unique ecosystem occurs which includes a plant and animal inter-relationship in sacred groves and adjoining plateau area.

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INTRODUCTION

INTRODUCTION

Sahyadri ranges are second endemic center in India which is amongst the 34 biodiversity hotspots of the world (Synge, 2005). Western Ghats is renowned as treasure of endemic plants & animals with unique biodiversity and recently this area is recognized by world body of UNESCO as world heritage site. It is a fact and matter of pride that the state of Maharashtra is home to four of these World heritage sites due to its uniqueness and richness. Western Ghats is repository for various flora and fauna, most of them which are endemic to the area. Our cultural conservation practices in the form of 'Sacred Groves (SGs)' or 'Devrais' or 'Devarhat' are evidences of traditional forest conservation practices. Sacred groves are considered the relicts of evergreen forest vegetation which once existed in the locality and later lost due to anthropogenic interventions like shifting cultivation, overexploitation of forest produce, cattle grazing and changes in land use by converting forests to monoculture plantations like mango, cashew nuts, tea, coffee, cardamom, rubber, teak, eucalyptus, etc.; agricultural lands and dwelling sites.

The first inventory of SGs of Maharashtra has been carried by Late Dr. V.D. Vartak in 1970 (Vartak & Gadgil, 1980) and reported 233 SGs and subsequently Deshmukh in 1999 reported more than 2800 SGs. These are distributed in Pune, Raigad, Ratnagiri, Sindhudurga and Kolhapur districts (Waghchaure *et al*, 2006) of Maharashtra state. SGs along the Western Ghats from Maharashtra and Goa has been studied by Vartak, V. D. and Gadgil, M. (1981) which consist of listing along with short botanical study in the SGs of these areas. These forests patches are islands of forests which are rich in biodiversity with diverse life forms and habitats.

Western side of Sahyadri ranges consists of narrow strip of undulating terrain with unique coastal vegetation (below 100-150m) in Sindhudurga, Ratnagiri, Raigad and Thane districts of Maharashtra state. A distinct feature of the west coast is the presence of rocky lateritic plateaus or ferricretes, with less perennial vegetation and rich monsoon ephemeral flora. These lateritic plateaus harbor small islands of forests which are identified as Sacred Groves. 'Sacred Groves' or 'Devrais' are evidences of traditional forest conservation practices in these diverse habitats. In the present investigation around 27 Sacred Grooves have been reported and studied from Rajapur, Lanja, Ratnagiri and Dapoli taluka of Ratnagiri districts.

Sacred groves have served as important reservoirs of biodiversity, preserving unique species of plants, insects, and animals. The interrelationship between faunal diversity and vegetation of sacred groves of lateritic plateaus and adjoining area is not properly studied. Therefore to understand potential of sacred groves on lateritic plateaus in conservation, detailed assessment of life forms is carried out. In Maharashtra, Watve (2003, 2009) and Watve & Thakur (2006) have conducted ecological studies on vegetation of the plateaus. The present study was carried out to document the diversity of plants and animals occurs in sacred groves. A detailed survey related to flowering plants has been done. Efforts were made to understand the inter-relationship between plant and animal species occurring in such unique landmass of Ratnagiri district.

The rocky plateaus on the Western Ghats are described as terrestrial habitat islands facing extreme micro-environmental conditions, and even though it is documented that rocky outcrops such as inselbergs, barrens and others support rich and threatened floristic endemism. Tropical grasslands on coastal lateritic plateaus are extremely important from the scientific point of view as they are populated by quite wide variety of species, with interesting unique, physiological and behavioural properties. The species form a part of functional communities, they make the good subject for the study of ecology, especially the habitats are small and the data is applicable to larger situations and ecological theory in general. These coastal lateritic plateaus are isolated terrestrial islands. The surface of these plateaus is strongly weathered and even that enables to support various habitats, (Lekhak and Yadav (2012).

The high conservation and biodiversity values of sacred groves, increasing attention due to their potential as a tool and model for biodiversity conservation. The study area is continuously affecting due to many anthropogenic activities like cultivation of fruit plants like Mango and Cashew-nut, shifting cultivation practices by local communities. The biotic pressure on the sacred groves is increasing tremendously.

The documentation and earlier inventories of 2800 sacred groves from Maharashtra were mainly based on data gathered from forest department, revenue authorities, panchayat pramukh and local villagers. Very few sacred groves were analysed from floristic survey and ecological study point of view. The biotic pressure on the sacred groves is increasing tremendously through the course of various developmental activities. Therefore the conservation of these islands became a urgent need of time.

The new approach of present investigation is to understand Vasicular Arbuscular Mycorrhizal Fungal association with Rare, Endangered, Threatened (RET) and endemic plants from the study area. Arbuscular mycorrhizal (AM) fungi are key factor in natural growth of more than 70% plants. It is increasingly evident that the mycorrhizal colonization of endangered plant species is of major importance for their restoration. Unfortunately inventories on mycorrhizal association of rare, endangered and endemic plant species are not yet initiated on forefront of plant conservation programme in India.

So far Ratnagiri district is concern, about 830 SGs has been recorded by Deshmukh in 1998 and visited about 17 SGs. A total of 1202.6 hecters area in Ratnagiri has been occupied by SGs which seems to be the largest and regarded as 'Hot Spots' of SGs in Maharashtra state. The high conservation and biodiversity values of sacred groves, increasing attention due to their potential as a tool and model for biodiversity conservation. The natural vegetation and SGs are continuously affecting due to many anthropogenic activities like cultivation of fruit plants like Mango and Cashew-nut, shifting cultivation practices by local communities, rock-brick (Chire) mines, etc.

In present investigation two Endangered taxa viz., *Brachystelma malwanense* S.R. Yadav & N.P. Singh and *Gymnema khandalense* Santapau were recorded from study area are analysed to understand AM association. Both the plants were possessing all the three mycorrhizal components viz., vesicles, arbuscules and hyphae under natural condition. In the present investigation, we have conducted detailed analysis of floristic diversity, ethnobotanical data analysis, ecological survey and plant-animal inter-relationship in different sacred groves located in coastal lateritic plateaus of Ratnagiri district.

Figure 1- Enumeration of Sacred Groves in Maharashtra State

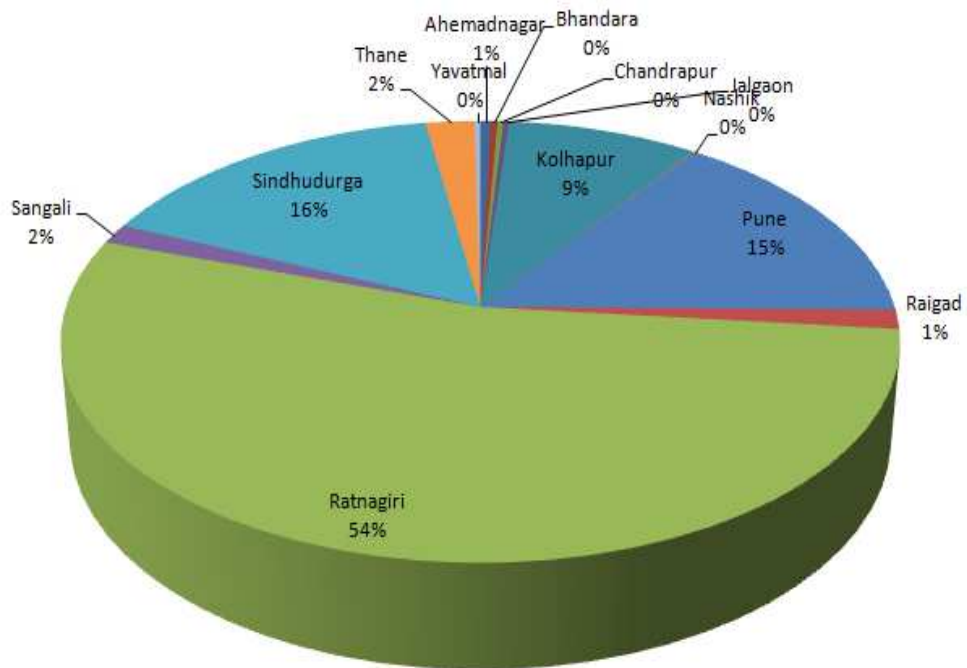


Figure -2 Area wise distribution of SGs in Maharashtra State

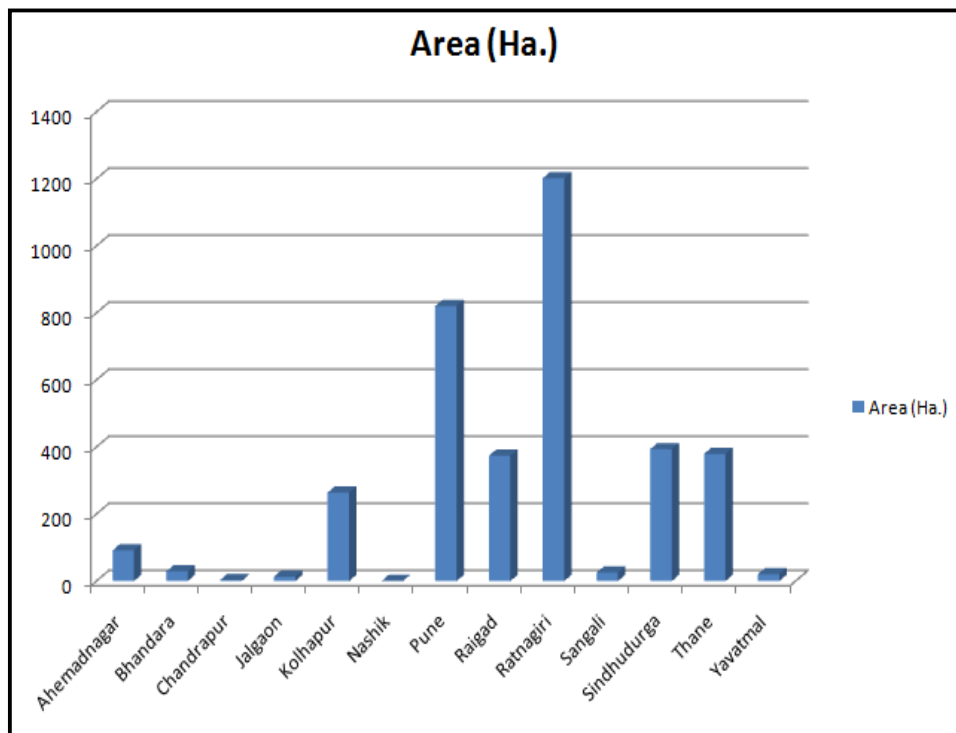


Table-1 List of Taluka wise Total Sacred Groves (SGs) Reported from Ratnagiri district, Maharashtra State

Sr. 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



RATNAGIRI DISTRICT AT A GLANCE

RATNAGIRI DISTRICT AT A GLANCE

Ratnagiri district is situated in the western coast of Maharashtra state which is surrounded by Sahyadri hills (with Satara, Sangli and Ratnagiri districts) in the east side while Arabian Sea in the western side while Sindhudurg district in the south and Raigad district in the north side. It has north-south length of about 180 km and average east-west extension of about 64 km that covers eight talukas. Out of total geographical area of Ratnagiri district is concern, more than 51 % area is under forest, but majority of the area is under ‘private forest’ or ‘malaki land’ in different talukas like Ratnagiri, Chiplun, Mandangad, Dapoli, Khed, Guhagar, Sangameshwar, Lanja and Rajapur. More than 80 % land in the district is under hilly area with undulating terrain and unique coastal vegetation. A distinct feature of this area is the presence of rocky lateritic plateaus or ferocrates, which have tremendous amount of loose scattered laterite, with less perennial vegetation and rich monsoon ephemeral flora.

Figure 3: Administrative Map of Ratnagiri district:

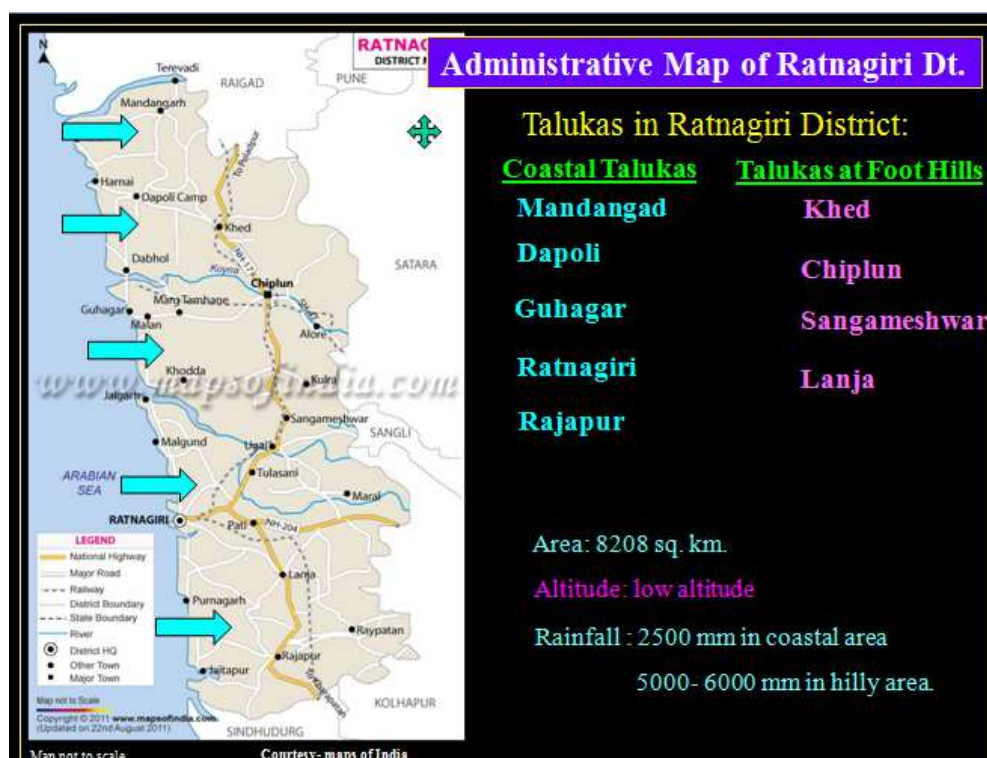


Figure 4: Vegetation Map and Major Rivers of Ratnagiri District-

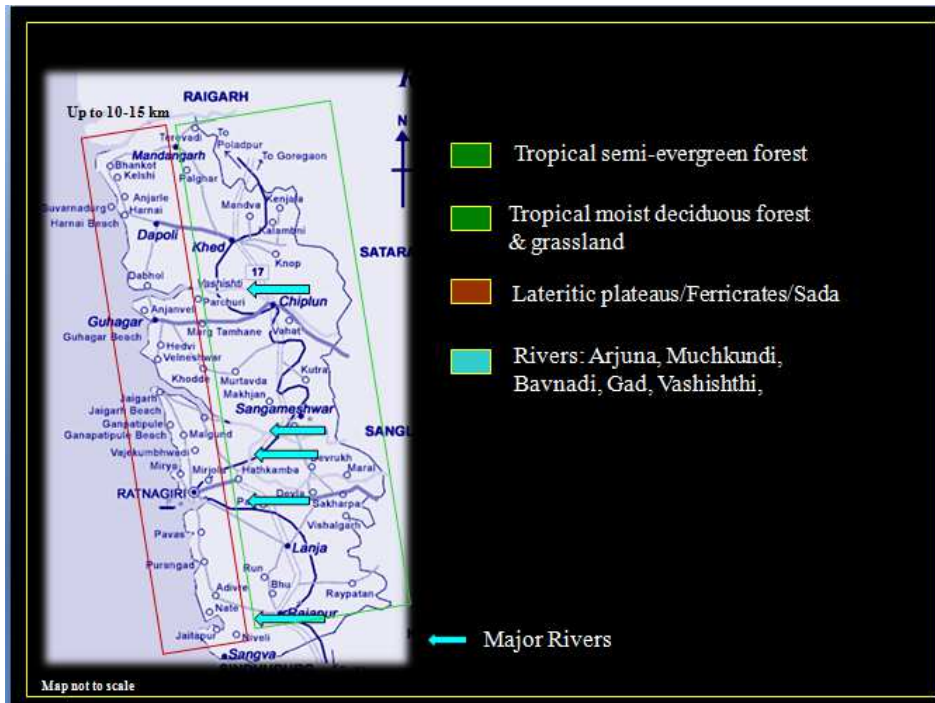


TABLE 2: Meteorological conditions of these lateritic plateaus during monsoon season

Month	Rainfall (mm)	Temperature (°C)			Humidity (%)	
		Maximum	Minimum	Mean	8:30 a.m.	17:30 p.m.
August	547.5	28.8	24.3	26.5	95	87
September	121.6	30.1	24.2	27.1	91	79
October	97.5	31.9	24.7	28.3	90	79
November	Trace	33.8	22.9	28.4	86	65

AIMS AND OBJECTIVES-

- a. To study ecological importance of coastal sacred grooves.
- b. To understand the floristic diversity of sacred grooves along the west coast of Ratnagiri district.
- c. To study ethno-medicinal value of sacred grooves.
- d. To study inter-relationship between plants and animals.

MATERIALS AND METHODS-

Field visits were made in different seasons and sacred groves are marked with GPS. Study area has been sampled for plant and animal species. A qualitative and quantitative assessment of study area has been carried out by random sampling methods. The plant materials collected have been preserved in laboratory and identified by using standard taxonomic tools. The RET (Rare, Endangered & Threatened) species of plants and animals has been identified. The status of the plant species was assessed as per the IUCN Red List Categories and Criteria (IUCN, 2001). During the investigation of sacred groves, efforts were also made to understand plants and fungal association especially Mycorrhizal fungi were analysed and it is supposed to be the new approach of the Mycorrhizal-RET category plants association. Along with this data interaction between many endemic plant taxa and insects, birds and other animal species were documented by micro and macro-photography.

OBSERVATIONS:

Composition of Sacred Groves of Lateritic Plateaus:

1. Ethnobotanical Importance of the Sacred Groves:

Sacred groves are the important source of a variety of medicinal plants, fruits, fodder, fuelwood, spices, etc. The study of interrelationship between the human beings and plants and animals in their surrounding environment (i.e. ethnobiology) is very revealing. The role of sacred groves in the conservation of the regional medicinal plants has been emphasized in several studies from different parts of the country. Availability and habitat preference of RET category medicinal plants of SGs of coastal lateritic plateaus of Ratnagiri district have been assessed in the present investigation.

Table-3 List of Sacred Grooves Studied from lateritic plateaus with their geographical locations in Ratnagiri district

Sr. No.	Name of Sacred Groove	Name of Deity	GPS Location & Elevation (m.s.l.)
1.	Kasheli	Adiware Rai	16°43.693' N & 73°19.269' E (Elv. 11m)
2.	Chanderai	Adiware Devi	16°41.784' N & 73°22.751' E (Elv. 96m)
3.	Tale Rai	Taledevi	16°40.127' N & 73°21.552' E (Elv. 73m)
4.	Jamshenda	Adiware Devi	16°42.080' N & 73°21.561' E (Elv. 72m)
5.	Bharadi Rai	Bharadi Devi	16°40.854' N & 73°20.251' E (Elv. 90m)
6.	Nate	Naterai	16°40.537' N & 73°28.487' E (Elv. 123m)
7.	Bhade	Shivshankar Rai	16°46.429' N & 73°20.479' E (Elv. 60m)
8.	Khanavali	Navalai Devi	16°48.905' N & 73°25.316' E (Elv. 134m)
9.	Shirgaon	Shirgao Devi	17°01.120' N & 73°18.311' E (Elv. 03m)
10.	Punas	Kondawadi	16°45.430' N & 73°20.479' E (Elv. 61m)
11.	Kadiwadi	Kaduchiwadi Rai	16°45.429' N & 73°20.480' E (Elv. 62m)

12.	Harche	Jakhadevi	16°45.919' N & 73°24.896'E (Elv. 11m)
13.	Beni	Shankar	16°46.920' N & 73°25.897'E (Elv. 11m)
14.	Kuve	Ganeshrai	16°48.694' N & 73°33.548'E (Elv. 129m)
15.	Gangotri	Gangotri	16°38.749' N & 73°32.274'E (Elv. 61m)
16.	Sasale	Sasale Rai	16°38.037' N & 73°35.872'E (Elv. 154m)
17.	Angale	Chandika Devi	16°39.485' N & 73°35.698'E (Elv. 161m)
18.	Gangoli wadi	Sasale	16°38.477' N & 73°35.025'E (Elv. 158m)
19.	Pangare	Shankar	16°37.852' N & 73°34.102'E (Elv. 123m)
20.	Kodawali	Shankar	16°40.234' N & 73°31.508'E (Elv. 122m)
21.	Dhaunwalli	Jakhadevi	16°39.239' N & 73°23.920'E (Elv. 33m)
22.	Pawas	Gangomadir	16°39.990' N & 73°23.245'E (Elv. 135m)
23.	Nakhare	Bhutachizal	16°51.640' N & 73°20.791'E (Elv. 49m)
24.	Ganeshgule	Ganesh Rai	16°51.999' N & 73°18.138'E (Elv. 65m)
25.	Kalzondi	Laxmikeshav	17°42.121' N & 73°22.411'E (Elv. 124m)
26.	Kalzondi	Gavdevi	17°42.120' N & 73°23.412'E (Elv. 123m)
27.	Kalzondi	Gavdevi	17°42.121' N & 73°23.412'E (Elv. 124m)

PLATE 1.A

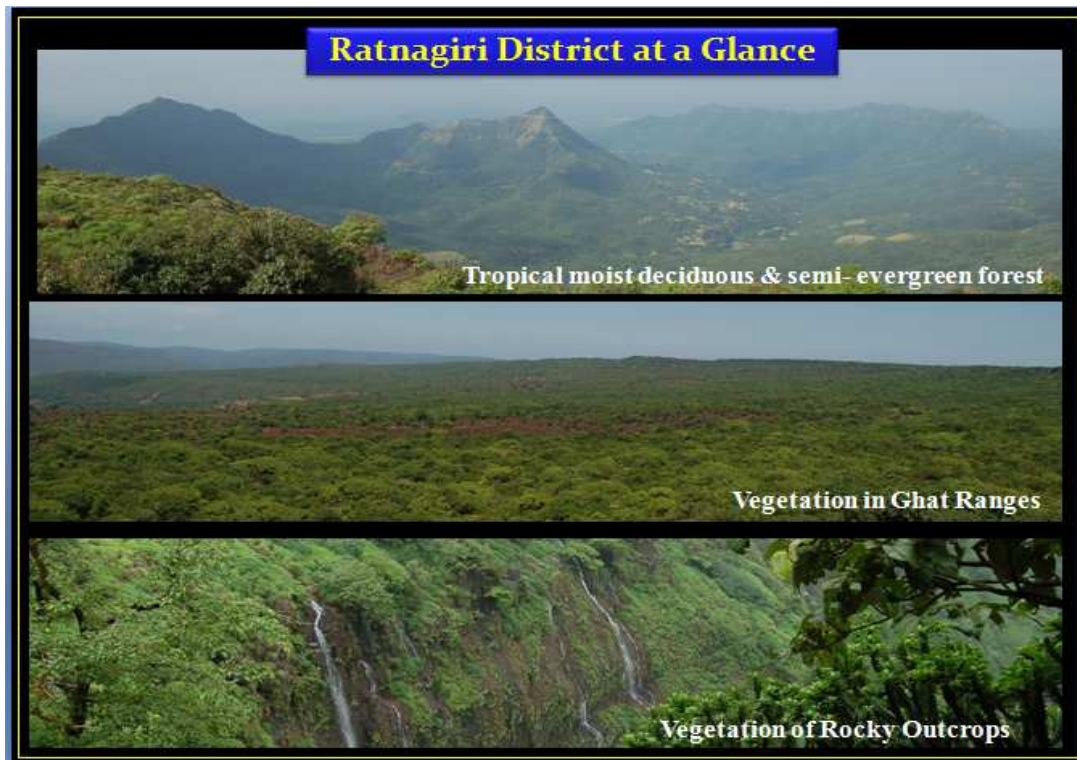


PLATE 1.B



PLATE- 2.A

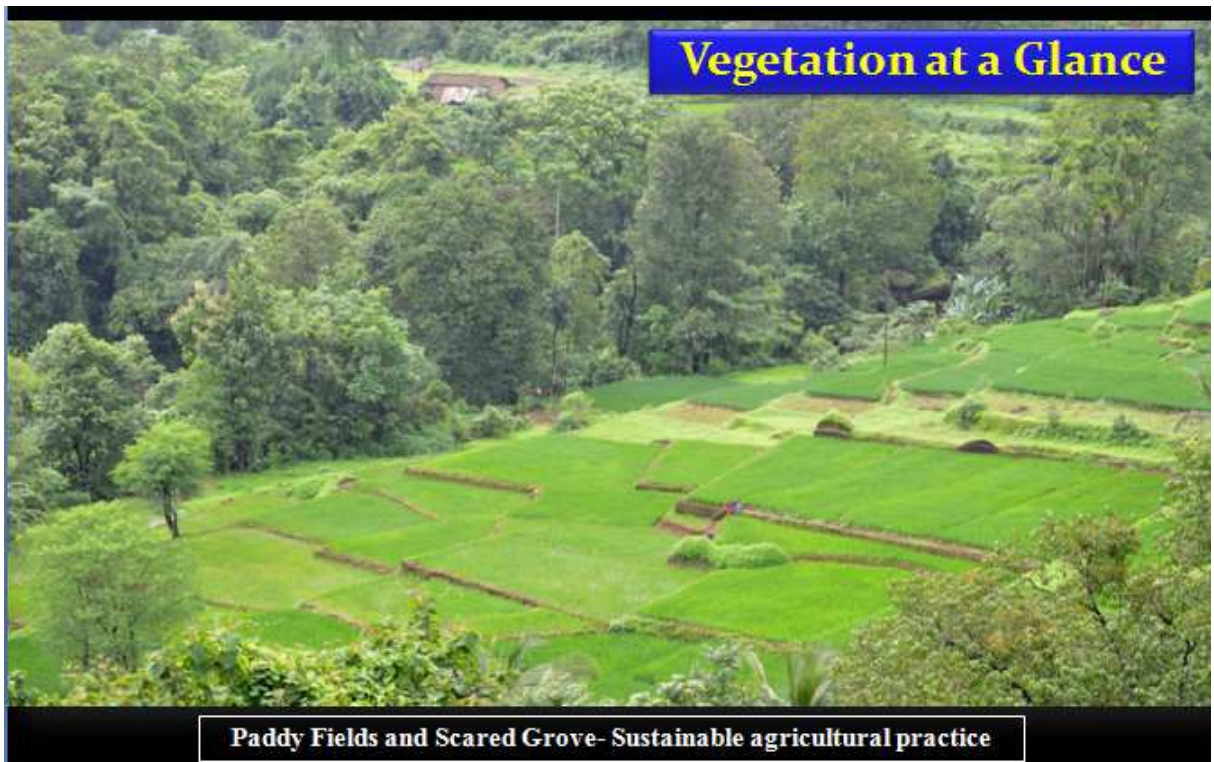


PLATE- 2.B



PLATE- 3.A



PLATE- 3.B



PLATE- 4.A



PLATE- 4.B

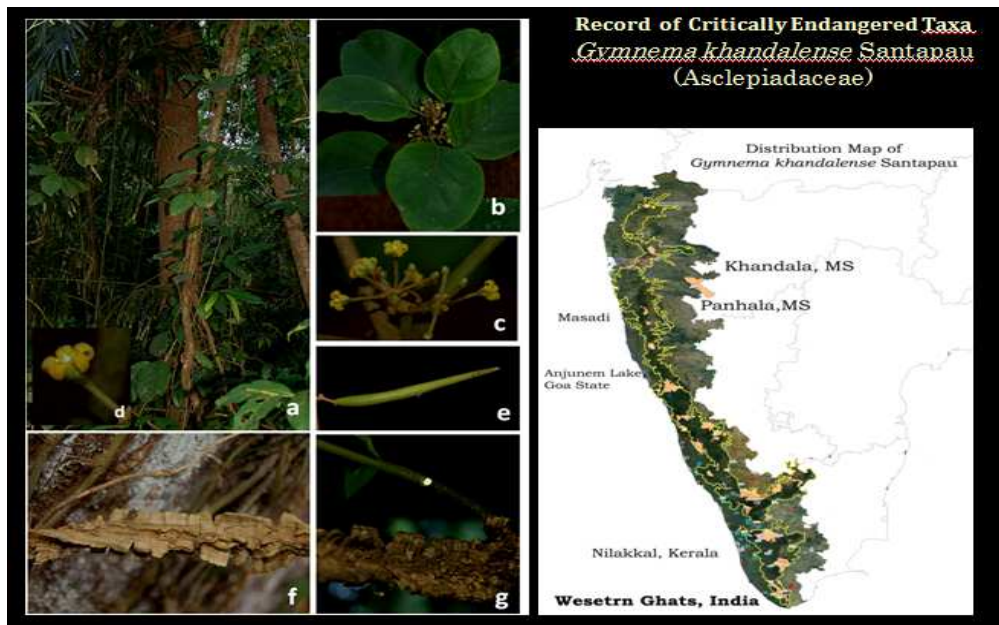


PLATE- 5.A

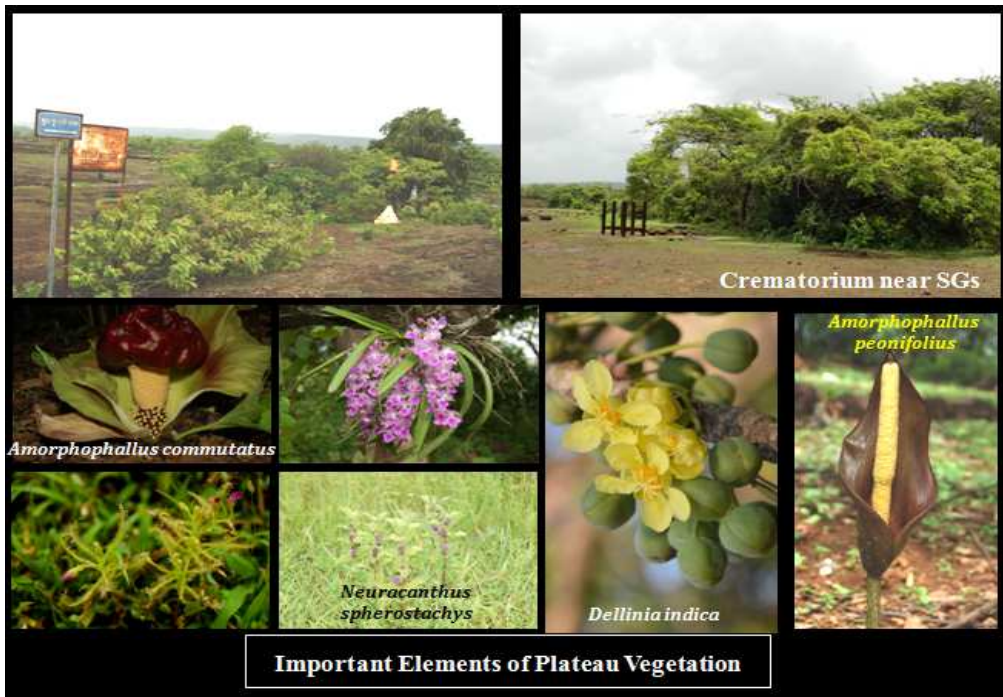


PLATE- 5.B



Table-4: Talukawise List of Sacred Grooves of Ratnagiri district with area and Deity**4A: Chiplun Taluka:**

No.	Taluka	Nearest Village	Area (Ha.)	Deity
1	Chiplun	Adare	0.77	-
2	Chiplun	Agave	2.48	-
3	Chiplun	Akale	4.45	-
4	Chiplun	Alore	3.47	Sukhaidevi
5	Chiplun	Ambatkhol	4.83	-
6	Chiplun	Ambre Bk.	0.13	-
7	Chiplun	Anari	1.03	-
8	Chiplun	Asurde	3.14	-
9	Chiplun	Behela	6.13	-
10	Chiplun	Bhom	6	-
11	Chiplun	Bir	2.13	-
12	Chiplun	Bolope	0.61	-
13	Chiplun	Borgaon	1.17	-
14	Chiplun	Chiplun	0.04	-
15	Chiplun	Dahivali	0.81	-
16	Chiplun	Dalavatne	4.58	-
17	Chiplun	Dervan	10.74	-
18	Chiplun	Dev Kherdi	0.86	-
19	Chiplun	Dhakmoli	1.92	-
20	Chiplun	Dhokravali	1.48	-
21	Chiplun	Durgawadi	0.54	-
22	Chiplun	Furus	1.39	-
23	Chiplun	Gane	6.07	-
24	Chiplun	Gangarai	0.81	-
25	Chiplun	Gondhale	3.97	-
26	Chiplun	Gudhe	0.3	-
27	Chiplun	Gulvane	1.17	-
28	Chiplun	Hadkani	0.45	-
29	Chiplun	Hugbe	0.76	-
30	Chiplun	Kadvad	8.78	-
31	Chiplun	Kalambaste	0.93	-
32	Chiplun	Kalmundi	1.73	-
33	Chiplun	Kamsal	1.54	-
34	Chiplun	Kamthe	2.83	-
35	Chiplun	Kamthe Kd.	0.73	-

36	Chiplun	Kapre	1.11	-
37	Chiplun	Karambavane	0.34	-
38	Chiplun	Katroli	0.34	-
39	Chiplun	Kere	0.41	-
40	Chiplun	Ketki	0.97	-
41	Chiplun	Khandat	0.38	
42	Chiplun	Khandotri	2.56	
43	Chiplun	Kharwate	1.06	-
44	Chiplun	Kherde	0.01	-
45	Chiplun	Khershet	0.62	-
46	Chiplun	Khopad	0.58	-
47	Chiplun	Kokare	1.82	-
48	Chiplun	Kolakwadi	27.56	Waghjai
49	Chiplun	Kondhar Tamhane	1.85	-
50	Chiplun	Kondphansavane	4.21	-
51	Chiplun	Kosbi	3.24	-
52	Chiplun	Kosbi	1.38	-
53	Chiplun	Kotakwadi	27.56	
54	Chiplun	Kudap	14.81	-
55	Chiplun	Kumbharli	4.96	Mahakali
56	Chiplun	Kushicacle	2.47	-
57	Chiplun	Kutare	9.86	
58	Chiplun	Majre Kashi	0.34	-
59	Chiplun	Majre Kondhare	0.53	-
60	Chiplun	Mandaki	0.71	-
61	Chiplun	Manergoval	1.7	-
62	Chiplun	Mirbade	3.76	-
63	Chiplun	Mirvane	0.67	-
64	Chiplun	Mirjoli	0.28	-
65	Chiplun	Moravane	0.32	
66	Chiplun	Moravane Bk.	0.12	-
67	Chiplun	Mundhe Turf Sawarda	2.02	-
68	Chiplun	Mundhe Turf Chiplun	2.55	-
69	Chiplun	Murtawade	0.08	-
70	Chiplun	Nagabe	0.32	-
71	Chiplun	Nandgaon	2.28	-
72	Chiplun	Nandivase	0.53	-
73	Chiplun	Nandivase	11.29	-
74	Chiplun	Narad Kherdi	1.94	-

75	Chiplun	Nayashi	0.37	-
76	Chiplun	Nivali	5.33	-
77	Chiplun	Omali	9.03	-
78	Chiplun	Palwan	2.06	-
79	Chiplun	Pathe	13.73	-
80	Chiplun	Pedhambe	0.79	-
81	Chiplun	Pilavali turf Sawarda	0.53	-
82	Chiplun	Pilavali turf Valab	0.2	-
83	Chiplun	Pimpale Bk.	0.4	-
84	Chiplun	Pimpale Kd.	0.62	-
85	Chiplun	Rivtoli	5.93	-
86	Chiplun	Pophali	0.32	-
87	Chiplun	Rampur	1.07	-
88	Chiplun	Sawarde	12.18	-
89	Chiplun	Sawarde	0.1	-
90	Chiplun	Sawarde	0.87	-
91	Chiplun	Shiral	1.73	-
92	Chiplun	Shirgaon	6.87	Pintubai
93	Chiplun	Shirvali	0.36	-
94	Chiplun	Talavade	0.8	-
95	Chiplun	Talsar	0.35	-
96	Chiplun	Tamhan Mala	0.12	-
97	Chiplun	Tanali	0.91	-
98	Chiplun	Tarab	6	-
99	Chiplun	Tarab Bk.	0.69	-
100	Chiplun	Tibadi	2.34	
101	Chiplun	Tondali	1.9	-
102	Chiplun	Turambav	1.79	-
103	Chiplun	Tivare	1.34	
104	Chiplun	Umale	1.63	-
105	Chiplun	Umroli	3.95	-
106	Chiplun	Valoti	0.12	
107	Chiplun	Vareli	0.69	-
108	Chiplun	Yegaon	2.47	-

4 B: Ratnagiri Taluka:

Sr. No.	Name of Taluka	Nearest Village	Area (Ha.)	Deity
1	Ratnagiri	Agvae turf	0.35	-
2	Ratnagiri	Agvae turf	0.35	-
3	Ratnagiri	Bhagvatinagar	0.12	-
4	Ratnagiri	Bhagvatinagar	0.09	-
5	Ratnagiri	Bhave Adom	0.74	-
6	Ratnagiri	Bhoke	1.05	-
7	Ratnagiri	Bhoke	0.1	-
8	Ratnagiri	Chindravali	1.23	-
9	Ratnagiri	Dande Adom	0.28	-
10	Ratnagiri	Dhamanse	0.02	-
11	Ratnagiri	Dhamanse	0.12	-
12	Ratnagiri	Dhamanse	0.26	-
13	Ratnagiri	Dorle	0.28	-
14	Ratnagiri	Dorle	0.36	-
15	Ratnagiri	Ganapatipule	5	Ganapati
16	Ratnagiri	Ganvade Ambere	0.09	-
17	Ratnagiri	Harchiri	0.94	-
18	Ratnagiri	Harchiri	1.34	-
19	Ratnagiri	Hatkhamba	1.77	-
20	Ratnagiri	Jaigad	0.24	-
21	Ratnagiri	Jaigad	0.1	-
22	Ratnagiri	Jambhari (Kharviwada)	0.06	-
23	Ratnagiri	Karbude	0.18	-
24	Ratnagiri	Kasheli	0.62	-
25	Ratnagiri	Kelye	0.07	-
26	Ratnagiri	Kalgaon	0.6	-
27	Ratnagiri	Kalgaon	0.24	-
28	Ratnagiri	Kalgaon	0.06	-
29	Ratnagiri	Khandu	11.24	-
30	Ratnagiri	Khandu	0.97	-
31	Ratnagiri	Khandu	4.05	-
32	Ratnagiri	Khandu	0.2	-
33	Ratnagiri	Khandu	0.09	-
34	Ratnagiri	Khedshi	0.64	-
35	Ratnagiri	Kodgaon	1.22	-
36	Ratnagiri	Kodgaon	6.88	-
37	Ratnagiri	Kondvi	0.65	-

38	Ratnagiri	Kotharewadi (Veland)	0.89	-
39	Ratnagiri	Kumbharwada	1.48	-
40	Ratnagiri	Lajul	0.05	-
41	Ratnagiri	Lajul	0.09	-
42	Ratnagiri	Mavalange	1.62	-
43	Ratnagiri	Mavalange	0.04	-
44	Ratnagiri	Mavalange	0.02	-
45	Ratnagiri	Mirjole	0.45	-
46	Ratnagiri	Naglewadi	1.01	-
47	Ratnagiri	Nakhare	0.02	-
48	Ratnagiri	Nandivade	0.06	-
49	Ratnagiri	Nandivade	0.07	-
50	Ratnagiri	Nandivade	0.04	-
51	Ratnagiri	Nevre	0.33	-
52	Ratnagiri	Nirul	0.17	-
53	Ratnagiri	Nirul	0.61	-
54	Ratnagiri	Nivali	0.18	-
55	Ratnagiri	Ori	1.25	-
56	Ratnagiri	Ranpur	0.15	-
57	Ratnagiri	Ranpur	0.02	-
58	Ratnagiri	Ril	0.21	-
59	Ratnagiri	Ril	0.79	-
60	Ratnagiri	Ril	0.14	-
61	Ratnagiri	Ril	0.06	-
62	Ratnagiri	Saitwade	0.09	-
63	Ratnagiri	Saitwade	0.51	-
64	Ratnagiri	Shendelavgan	0.51	-
65	Ratnagiri	Sarfarewadi	0.28	-
66	Ratnagiri	Sathare	1.5	-
67	Ratnagiri	Shil	0.65	-
68	Ratnagiri	Shivar Ambere	1.05	-
69	Ratnagiri	Shivar Ambere	0.09	-
70	Ratnagiri	Shirgaon	0.95	-
71	Ratnagiri	Taraval	1.32	-
72	Ratnagiri	Tarve Wadi	1.13	-
73	Ratnagiri	Tebhye	0.4	-
74	Ratnagiri	Tike	0.95	-
75	Ratnagiri	Vatad	0.36	-
76	Ratnagiri	Velvand	0.65	-

77	Ratnagiri	Velvand	1.7	-
78	Ratnagiri	Velvand	0.33	-
79	Ratnagiri	Vilye	0.89	-
80	Ratnagiri	Vilye	0.09	-
81	Ratnagiri	Vilye	0.04	-
82	Ratnagiri	Vilye	0.2	-
83	Ratnagiri	Vilye	0.18	-

4 C: Dapoli Taluka:

Sr. No.	Taluka	Nearest Village	Area (Ha.)	Diety
1	Dapoli	Asnod	2.5	Shankar
2	Dapoli	Gavtale	3	Shankar
3	Dapoli	Sadavali	12.14	-
4	Dapoli	Kudavale	46	Bhairidevi

4 D: Mandangad Taluka:

Sr. No.	Taluka	Nearest Village	Area (Ha.)	Diety
1	Mandangad	Pat	18.01	-

4 E: Lanja Taluka:

Sr. No.	Taluka	Nearest Village	Area (Ha.)	Diety
1	Lanja	Adavali	0.22	-
2	Lanja	Adavali	1.62	-
3	Lanja	Adavali	1.04	-
4	Lanja	Adavali	0.09	-
5	Lanja	Adavali	0.49	-
6	Lanja	Agave	0.5	Mhasoba
7	Lanja	Agave	0.3	-
8	Lanja	Agave	0.12	-
9	Lanja	Aarsage	1.26	-
10	Lanja	Argaon	4.09	Kedarling
11	Lanja	Argaon	0.95	-
12	Lanja	Aasage	0.26	-
13	Lanja	Aasage	0.75	-
14	Lanja	Ambode	0.04	-
15	Lanja	Ambode	1.98	-

16	Lanja	Ambode	0.31	-
17	Lanja	Anjanari	1.03	-
18	Lanja	Anjanari	0.15	-
19	Lanja	Anjanari	0.11	-
20	Lanja	Beni Kh.	1.5	-
21	Lanja	Beni Kh.	1.21	-
22	Lanja	Bhambed	2.81	Laxmi
23	Lanja	Bhambed	0.4	Adhishthide
24	Lanja	Bhambed	0.06	-
25	Lanja	Bhambed	0.18	-
26	Lanja	Bhambed	4.73	Khutadevi
27	Lanja	Bhambed	0.8	Adhishthide
28	Lanja	Bivali	1.27	-
29	Lanja	Bivali	2.79	-
30	Lanja	Borivale	0.83	-
31	Lanja	Borivale	1.38	-
32	Lanja	Borivale	1.09	-
33	Lanja	Borthade	0.15	-
34	Lanja	Borthade	2.54	-
35	Lanja	Borthade	1.21	-
36	Lanja	Borthade	0.49	-
37	Lanja	Borthade	1.15	-
38	Lanja	Devdhe	1.98	-
39	Lanja	Devdhe	0.35	-
40	Lanja	Dhundre	0.28	-
41	Lanja	Gavane	7.12	Raghoba
42	Lanja	Gavane	0.65	-
43	Lanja	Golvashi	5.43	Naga Devi
44	Lanja	Govil	1.21	-
45	Lanja	Govil	4.25	-
46	Lanja	Hardakhale	0.4	-
47	Lanja	Hardakhale	0.4	-
48	Lanja	Hardakhale	0.77	-
49	Lanja	Hardakhale	9.96	-
50	Lanja	Hardakhale	0.16	-
51	Lanja	Hardakhale	0.19	-
52	Lanja	Hardakhale	9.23	-
53	Lanja	Hardakhale	0.03	-
54	Lanja	Hanagavali	2.93	-

55	Lanja	Hasol	1.38	-
56	Lanja	Hasol	0.87	-
57	Lanja	Hasol	0.1	-
58	Lanja	Hasol	1.42	-
59	Lanja	Hasol	2.1	-
60	Lanja	Ijavali	1.65	-
61	Lanja	Ijavali	1.09	-
62	Lanja	Indavati	1.59	-
63	Lanja	Irche	0.11	-
64	Lanja	Irche	0.4	-
65	Lanja	Irche	0.87	-
66	Lanja	Kangavali	1.17	-
67	Lanja	Kante	0.5	-
68	Lanja	Kante	0.3	Kaloba
69	Lanja	Kante	0.3	Sankeshwar
70	Lanja	Kante	0.1	-
71	Lanja	Karle	1.07	
72	Lanja	Karle	1.35	
73	Lanja	Kelambe	0.03	-
74	Lanja	Kelambe	1.86	-
75	Lanja	Khanavali	0.49	-
76	Lanja	Khanavali	1.57	-
77	Lanja	Khavdi	3.32	Jaka Devi
78	Lanja	Khavdi	3.55	Kurkhai Devi
79	Lanja	Khavdi	4.34	Navala Devi
80	Lanja	Khervase	1.26	-
81	Lanja	Khervase	0.24	-
82	Lanja	Kolhewadi	1.6	-
83	Lanja	Khorgaon	1.07	
84	Lanja	Khorninko	7.49	
85	Lanja	Khorninko	3.76	
86	Lanja	Kocharo	1.82	
87	Lanja	Kocharo	0.49	
88	Lanja	Kocharo	0.26	
89	Lanja	Kocharo	0.61	
90	Lanja	Kondgaon	0.24	
91	Lanja	Kondye	6.17	Ravalnath
92	Lanja	Kondye	0.32	-
93	Lanja	Kondye	0.05	-

94	Lanja	Korle	0.06	
95	Lanja	Korle	1.2	
96	Lanja	Kot	0.22	Vajreshwari
97	Lanja	Kune	0.49	-
98	Lanja	Kune	0.42	-
99	Lanja	Kune	1.73	-
100	Lanja	Kune	1.51	-
101	Lanja	Kune	0.91	-
102	Lanja	Kune	2.97	-
103	Lanja	Kune	1.37	-
104	Lanja	Kurang	0.5	
105	Lanja	Kurang	1.21	
106	Lanja	Kurang	0.06	
107	Lanja	Kurchumba	0.8	Nageshwar
108	Lanja	Kurchumba	0.2	Mhasveshwar
109	Lanja	Kurne	0.53	-
110	Lanja	Kurne	3.18	-
111	Lanja	Lanja	5	Bharadi Devi
112	Lanja	Lanja	1.01.	-
113	Lanja	Machal	2	Nateshwar
114	Lanja	Majal	.04.	-
115	Lanja	Majal	0.4	-
116	Lanja	Majal	0.18	-
117	Lanja	Majal	2.19	Navala Devi
118	Lanja	Majal	0.16	-
119	Lanja	Majal	0.18	-
120	Lanja	Math	0.89	-
121	Lanja	Nandavali	0.35	-
122	Lanja	Nioshi	0.22	-
123	Lanja	Padvan	0.16	-
124	Lanja	Padvan	0.26	-
125	Lanja	Padvan	0.16	-
126	Lanja	Padvan	0.12	-
127	Lanja	Padvan	0.32	-
128	Lanja	Padvan	0.06	-
129	Lanja	Palu	3.64	
130	Lanja	Palu	0.45	
131	Lanja	Palu	0.16	
132	Lanja	Palu	1	

133	Lanja	Palu	7.81	
134	Lanja	Panhale	0.24	-
135	Lanja	Panhale	0.06	-
136	Lanja	Panhale	0.2	-
137	Lanja	Panhale	0.24	-
138	Lanja	Panhale	0.08	-
139	Lanja	Panhale	0.27	-
140	Lanja	Panore	0.65	-
141	Lanja	Prabhanvalli	27.4	Gangoba
142	Lanja	Prabhanvalli	2.87	Umbareshwar
143	Lanja	Punas	5.58	Chandika
144	Lanja	Punas	0.2	-
145	Lanja	Punas	0.8	Votthalaidevi
146	Lanja	Punas	0.5	Vardanidevi
147	Lanja	Raon	1.38	-
148	Lanja	Raon	1.31	-
149	Lanja	Raon	1.13	-
150	Lanja	Raon	0.21	-
151	Lanja	Ringane	1.69	
152	Lanja	Ringane	0.85	
153	Lanja	Ringane	0.25	
154	Lanja	Salpe	10.9	
155	Lanja	Satavali	0.08	-
156	Lanja	Shiposhi	2.74	
157	Lanja	Shiposhi	0.53	
158	Lanja	Shiposhi	0.55	
159	Lanja	Shiravali (Varchi)	0.1	-
160	Lanja	Shiravali (Varchi)	4.49	Gango
161	Lanja	Shiravali (Varchi)	1.46	-
162	Lanja	Shiravali (Varchi)	0.54	-
163	Lanja	Shiravali (Varchi)	0.11	-
164	Lanja	Talavade	1.15	-
165	Lanja	Talavade	0.16	-
166	Lanja	Upale	0.8	Someshwar
167	Lanja	Upale	1.05	Nateshwar
168	Lanja	Vadgaon	0.16	-
169	Lanja	Vadgaon	7.74	-
170	Lanja	Vadgaon	0.98	-
171	Lanja	Vaghagaon	0.12	

172	Lanja	Vaghagaon	0.28	
173	Lanja	Vaghagaon	0.24	
174	Lanja	Vaghagaon	0.08	
175	Lanja	Vaked	4.44	Adhishthita Devi
176	Lanja	Vaked	0.41	-
177	Lanja	Vaked	0.17	-
178	Lanja	Vangule	4.37	Satyashwar
179	Lanja	Veral	0.77	-
180	Lanja	Veral	1.03	-
181	Lanja	Veravali Bk.	2.59	Kedarling
182	Lanja	Veravali Bk.	1.9	-
183	Lanja	Veravali Kd.	2.83	Navala Devi
184	Lanja	Vhel	0.12	
185	Lanja	Vhel	0.1	
186	Lanja	Vhel	3.72	Jugai
187	Lanja	Vilavade	0.12	-
188	Lanja	Vilavade	4.63	Mahadev
189	Lanja	Vilavade	2.78	Kedarling
190	Lanja	Yeravade	0.32	-
191	Lanja	Yeravade	0.58	-
192	Lanja	Yervade	0.36	-
193	Lanja	Yervade	0.53	-
194	Lanja	Zapade	0.26	-
195	Lanja	Zapade	0.42	-
196	Lanja	Zapade	0.06	-
197	Lanja	Zapade	0.12	-
198	Lanja	Zapade	0.1	-

4 F: Rajapur Taluka:

Sr. No.	Taluka	Nearest Village	Area (Ha.)	Diety
1	Rajapur	Aadavali	1.15	-
2	Rajapur	Aadavali	0.12	-
3	Rajapur	Aadavali	0.72	-
4	Rajapur	Aadavali	1.58	-
5	Rajapur	Aajivali	0.26	-
6	Rajapur	Aajivali	0.01	-
7	Rajapur	Aajivali	0.2	-

8	Rajapur	Aajivali	0.16	-
9	Rajapur	Aajivali	0.47	-
10	Rajapur	Aajivali	0.35	-
11	Rajapur	Aajivali	0.02	-
12	Rajapur	Aajivali	0.51	-
13	Rajapur	Ambhale	0.02	-
14	Rajapur	Ambhale	0.68	-
15	Rajapur	Ambhale	0.1	-
16	Rajapur	Ambhale	0.02	-
17	Rajapur	Ambhale	0.01	-
18	Rajapur	Ambhale	0.13	-
19	Rajapur	Ambhale	0.15	-
20	Rajapur	Anasure	0.18	-
21	Rajapur	Bijarwadi	0.06	-
22	Rajapur	Bandivade	0.22	-
23	Rajapur	Bandivade	0.66	-
24	Rajapur	Barasu	0.85	-
25	Rajapur	Barasu	0.18	-
26	Rajapur	Bhabalewadi	0.12	-
27	Rajapur	Bhabalewadi	0.13	-
28	Rajapur	Bhabalewadi	0.02	-
29	Rajapur	Bhalavali	0.45	-
30	Rajapur	Bhalavali	0.06	-
31	Rajapur	Bharadin	0.01	-
32	Rajapur	Bharadin	0.02	-
33	Rajapur	Bherdev	0.9	-
34	Rajapur	Bherdev	0.38	-
35	Rajapur	Bhoo	2.51	-
36	Rajapur	Chikhalgaon	0.13	-
37	Rajapur	Chikhalgaon	0.2	-
38	Rajapur	Chikhalgaon	0.32	-
39	Rajapur	Chikhalgaon	0.95	-
40	Rajapur	Chikhalgaon	0.1	-
41	Rajapur	Chikhalgaon	1.78	-
42	Rajapur	Chikhalgaon	1.5	-
43	Rajapur	Chikhalgaon	0.3	-
44	Rajapur	Chikhalgaon	1.7	-
45	Rajapur	Chikhalgaon	0.08	-
46	Rajapur	Chipatewadi	0.4	-

47	Rajapur	Chipatewadi	0.34	-
48	Rajapur	Chiravale	1.74	-
49	Rajapur	Chowke	unknown	-
50	Rajapur	Chunkodvat	2.1	-
51	Rajapur	Devache Gothane	0.16	-
52	Rajapur	Devache Gothane	0.16	-
53	Rajapur	Devache Gothane	0.52	-
54	Rajapur	Devihasol	0.75	-
55	Rajapur	Devihasol	0.02	-
56	Rajapur	Devihasol	0.12	-
57	Rajapur	Devihasol	0.2	-
58	Rajapur	Devihasol	0.36	-
59	Rajapur	Dhamarpe	0.1	-
60	Rajapur	Dhamarpe	0.71	-
61	Rajapur	Dhamarpe	1.17	-
62	Rajapur	Dhamarpe	0.77	-
63	Rajapur	Dhopeshwar	0.32	-
64	Rajapur	Dhopeshwar	0.04	-
65	Rajapur	Dhopeshwar	0.89	-
66	Rajapur	Donivade	2.23	-
67	Rajapur	Fupere	0.1	-
68	Rajapur	Fupere	0.17	-
69	Rajapur	Fupere	0.23	-
70	Rajapur	Fupere	0.02	-
71	Rajapur	Fupere	0.06	-
72	Rajapur	Fupere	0.24	-
73	Rajapur	Fupere	0.12	-
74	Rajapur	Ghiuvalli	0.02	-
75	Rajapur	Gokhalewadi	0.76	-
76	Rajapur	Gothane Donive	0.09	-
77	Rajapur	Gothane Donive	0.16	-
78	Rajapur	Gothane Donive	1.02	-
79	Rajapur	Goval	0.36	-
80	Rajapur	Gungavane	0.85	-
81	Rajapur	Haltivale	0.89	-
82	Rajapur	Haltivale	1.42	Gangeshwar
83	Rajapur	Haral	1.02	-
84	Rajapur	Haral	0.3	-
85	Rajapur	Hardi	0.04	-

86	Rajapur	Hatankarwadi	0.75	-
87	Rajapur	Hatankarwadi	0.87	-
88	Rajapur	Hatankarwadi	4.86	-
89	Rajapur	Hatole	2.15	-
90	Rajapur	Hatole	0.14	-
91	Rajapur	Hatole	0.04	-
92	Rajapur	Hatole	0.02	-
93	Rajapur	Hurse	0.16	-
94	Rajapur	Jambhavali	0.93	-
95	Rajapur	Juvati	0.04	-
96	Rajapur	Juvati	0.18	-
97	Rajapur	Juvati	0.14	-
98	Rajapur	Juvati	0.73	-
99	Rajapur	Juvati	0.83	-
100	Rajapur	Juvati	7.63	-
101	Rajapur	Juvejaithpur	0.15	-
102	Rajapur	Kajirda	4.05	Pangoba
103	Rajapur	Kajirda	0.05	-
104	Rajapur	Kajirda	0.16	-
105	Rajapur	Kalkawadi	0.1	-
106	Rajapur	Kalkawadi	0.03	-
107	Rajapur	Kalkawadi	0.03	-
108	Rajapur	Kalwadi	0.06	-
109	Rajapur	Kalwadi	0.91	-
110	Rajapur	Kalwadi	0.1	-
111	Rajapur	Kalwadi	0.91	-
112	Rajapur	Karak	0.26	-
113	Rajapur	Karak	2.03	-
114	Rajapur	Karak	0.02	-
115	Rajapur	Karak	0.07	-
116	Rajapur	Karak	0.03	-
117	Rajapur	Karak	0.02	-
118	Rajapur	Karak	0.06	-
119	Rajapur	Karak	0.19	-
120	Rajapur	Karak	0.05	-
121	Rajapur	Karak	0.04	-
122	Rajapur	Karak	2.86	-
123	Rajapur	Karavali	0.17	-
124	Rajapur	Karavali	0.11	-

125	Rajapur	Karavali	1.6	-
126	Rajapur	Karavali	0.32	-
127	Rajapur	Karvine	1.21	-
128	Rajapur	Karvine	0.09	-
129	Rajapur	Karvine	0.1	-
130	Rajapur	Karvine	0.51	-
131	Rajapur	Kasarwadi	0.49	-
132	Rajapur	Kasheli	0.09	-
133	Rajapur	Kelavade	0.45	-
134	Rajapur	Kelvali	0.06	-
135	Rajapur	Kelvali	0.79	-
136	Rajapur	Kelvali	0.45	-
137	Rajapur	Kelvali	0.67	-
138	Rajapur	Kelvali	0.02	-
139	Rajapur	Kelvali	4.37	-
140	Rajapur	Kelvali	2.67	-
141	Rajapur	Kelvali	2	-
142	Rajapur	Kelvali	2.38	-
143	Rajapur	Kelvali	2.71	-
144	Rajapur	Kelvali	0.03	-
145	Rajapur	Kelvali	0.47	-
146	Rajapur	Kelvali	0.09	-
147	Rajapur	Kelvali	0.05	-
148	Rajapur	Kelvali	0.1	-
149	Rajapur	Kelvali	0.5	-
150	Rajapur	Khalchiwadi	3.36	-
151	Rajapur	Khalchiwadi	0.24	-
152	Rajapur	Khalchiwadi	0.06	-
153	Rajapur	Kharavate	0.45	-
154	Rajapur	Kharavate	0.22	-
155	Rajapur	Kharavate	0.14	-
156	Rajapur	Kharavate	2.02	-
157	Rajapur	Kharavate	0.61	-
158	Rajapur	Kodavali	0.32	-
159	Rajapur	Kodavali	0.73	-
160	Rajapur	Kodavali	0.08	-
161	Rajapur	Kodawadi	0.46	-
162	Rajapur	Kodtivare	1.79	-
163	Rajapur	Kolamb	0.69	-

164	Rajapur	Kolamb	0.46	-
165	Rajapur	Kolvankhadi	2.81	-
166	Rajapur	Kolvankhadi	2.36	Dev
167	Rajapur	Kondye turf. Rajapur	0.25	-
168	Rajapur	Kondye turf. Saundal	0.55	-
169	Rajapur	Kondye turf. Saundal	0.39	-
170	Rajapur	Kondye turf. Saundal	0.38	-
171	Rajapur	Kondye turf. Saundal	0.84	-
172	Rajapur	Kotapur	0.13	-
173	Rajapur	Kumbhavade	0.57	-
174	Rajapur	Kumbhavade	0.45	-
175	Rajapur	Kumbhavade	1.42	-
176	Rajapur	Kumbhavade	0.17	-
177	Rajapur	Kumbhavade	0.11	-
178	Rajapur	Kumbhavade	0.11	-
179	Rajapur	Kunbivadi	0.06	-
180	Rajapur	Kunbivadi	0.07	-
181	Rajapur	Kuveshi	0.22	-
182	Rajapur	Mandrul	1.34	-
183	Rajapur	Mandrul	3.86	-
184	Rajapur	Mandrul	1.64	-
185	Rajapur	Mandrul	1.39	-
186	Rajapur	Mandrul	0.28	-
187	Rajapur	Manjari Kd.	0.1	-
188	Rajapur	Manjari Kd.	0.02	-
189	Rajapur	Math Kh.	2.24	-
190	Rajapur	Mithgavane	1.54	-
191	Rajapur	Mogare	0.32	-
192	Rajapur	Moor	2.74	-
193	Rajapur	Moor	0.1	-
194	Rajapur	Moor	0.01	-
195	Rajapur	Moor	4.56	Kaleshwar
196	Rajapur	Moor	0.11	-
197	Rajapur	Mogare	0.02	-
198	Rajapur	Morashi	0.09	-
199	Rajapur	Morashi	2.63	-
200	Rajapur	Morashi	0.14	-
201	Rajapur	Morashi	2.49	-
202	Rajapur	Morashi	0.04	-

203	Rajapur	Morashi	0.01	-
204	Rajapur	Morashi	0.05	-
205	Rajapur	Morashi	0.04	-
206	Rajapur	Morashi	0.03	-
207	Rajapur	Murudmatwadi	0.24	-
208	Rajapur	Nagavewadi	0.31	-
209	Rajapur	Nanar	0.73	-
210	Rajapur	Nanar	0.1	-
211	Rajapur	Nate	0.03	-
212	Rajapur	Oni	0.85	-
213	Rajapur	Oshivale	3.84	-
214	Rajapur	Oshivale	0.1	-
215	Rajapur	Oshivale	0.32	-
216	Rajapur	Ozar	0.25	-
217	Rajapur	Ozar	0.2	-
218	Rajapur	Ozar	0.32	-
219	Rajapur	Ozar	1.42	-
220	Rajapur	Ozar	2.23	Durga
221	Rajapur	Ozar	0.69	-
222	Rajapur	Pachal	0.16	-
223	Rajapur	Pachal	0.28	-
224	Rajapur	Pachal	0.42	-
225	Rajapur	Panamkarwadi	0.14	-
226	Rajapur	Pangare Bk.	2.01	-
227	Rajapur	Pangare Bk.	1.29	-
228	Rajapur	Pangare Bk.	0.39	-
229	Rajapur	Pangare Bk.	0.05	-
230	Rajapur	Panhale turf. Rajapur	0.12	-
231	Rajapur	Panhale turf. Rajapur	0.06	-
232	Rajapur	Panhale turf. Saundal	0.02	-
233	Rajapur	Panhale turf. Saundal	0.32	-
234	Rajapur	Panhale turf. Saundal	4.15	-
235	Rajapur	Panhale turf. Saundal	0.07	-
236	Rajapur	Paratvali	0.63	-
237	Rajapur	Patharde	0.02	-
238	Rajapur	Patilwadi	0.1	-
239	Rajapur	Parule	0.24	-
240	Rajapur	Parule	0.29	-
241	Rajapur	Parule	0.36	-

242	Rajapur	Parule	1.45	-
243	Rajapur	Parule	0.06	-
244	Rajapur	Pendarvane	2.02	-
245	Rajapur	Pendarvane	1.86	-
246	Rajapur	Prindavan	0.22	-
247	Rajapur	Prindavan	0.11	-
248	Rajapur	Prindavan	0.23	-
249	Rajapur	Pultavade	1.55	-
250	Rajapur	Pultavade	0.57	-
251	Rajapur	Pultavade	0.84	-
252	Rajapur	Raypatan	0.36	-
253	Rajapur	Raypatan	0.04	-
254	Rajapur	Raypatan	6.47	Vadjai Devi
255	Rajapur	Raypatan	0.04	-
256	Rajapur	Raypatan	1.98	-
257	Rajapur	Raypatan	1.56	-
258	Rajapur	Sasale	1.25	-
259	Rajapur	Satepe	0.04	-
260	Rajapur	Satepe	4.31	-
261	Rajapur	Satepe	1.7	-
262	Rajapur	Satepe	0.09	-
263	Rajapur	Satepe	0.12	-
264	Rajapur	Satepe	0.04	-
265	Rajapur	Saundal	0.7	-
266	Rajapur	Saundal	0.29	-
267	Rajapur	Saundal	0.09	-
268	Rajapur	Saundal	0.09	-
269	Rajapur	Saundal	0.16	-
270	Rajapur	Saundal	0.16	-
271	Rajapur	Saundal	0.09	-
272	Rajapur	Shedhe	0.17	-
273	Rajapur	Shedhe	0.32	-
274	Rajapur	Sheel	0.08	-
275	Rajapur	Sheel	0.04	-
276	Rajapur	Sheel	1.27	-
277	Rajapur	Sheel	0.36	-
278	Rajapur	Shembavane	0.46	-
279	Rajapur	Shembavane	0.61	-
280	Rajapur	Shendekarwadi	0.49	-

281	Rajapur	Shendekarwadi	1.46	-
282	Rajapur	Shendekarwadi	0.05	-
283	Rajapur	Shiniv	0.34	-
284	Rajapur	Shiniv	0.3	-
285	Rajapur	Talavade	0.31	-
286	Rajapur	Talavade	0.29	-
287	Rajapur	Talavade	0.17	-
288	Rajapur	Talavade	0.06	-
289	Rajapur	Talavade	0.26	-
290	Rajapur	Tamhane	0.07	-
291	Rajapur	Tamhane	1.78	-
292	Rajapur	Tamhane	0.04	-
293	Rajapur	Tamhane	0.21	-
294	Rajapur	Tamhane	1.18	-
295	Rajapur	Tamhane	0.05	-
296	Rajapur	Tamhane	0.12	-
297	Rajapur	Tamhane	0.31	-
298	Rajapur	Tamhane	0.1	-
299	Rajapur	Taral	0.31	-
300	Rajapur	Taral	0.65	-
301	Rajapur	Taral	0.71	-
302	Rajapur	Teravan	0.67	-
303	Rajapur	Thorli Wadi	1.42	-
304	Rajapur	Tiland	1.07	-
305	Rajapur	Tiland	1.09	-
306	Rajapur	Tiland	0.72	-
307	Rajapur	Tivare	0.2	-
308	Rajapur	Tivare	1.88	-
309	Rajapur	Tivare	0.81	-
310	Rajapur	Tivare	0.21	-
311	Rajapur	Unhale	0.06	-
312	Rajapur	Unhale	0.2	-
313	Rajapur	Unhale	0.33	-
314	Rajapur	Valvad	1.08	-
315	Rajapur	Valvad	0.13	-
316	Rajapur	Valvad	3.16	Bhairi Devi
317	Rajapur	Upale	0.24	-
318	Rajapur	Vadadatkhoh	0.61	-
319	Rajapur	Vadadatkhoh	1.9	-

320	Rajapur	Vadadatkhoh	0.08	-
321	Rajapur	Vadapeth	0.08	-
322	Rajapur	Vadapeth	0.22	-
323	Rajapur	Vadavali	1.54	-
324	Rajapur	Vadavali	2.51	Shankar
325	Rajapur	Vadavali	0.47	-
326	Rajapur	Vadavale	0.06	-
327	Rajapur	Vadhape	0.15	-
328	Rajapur	Vadhape	0.03	-
329	Rajapur	Vadhape	0.03	-
330	Rajapur	Valgaon	0.51	-
331	Rajapur	Valgaon	0.36	-
332	Rajapur	Valgaon	1.08	-
333	Rajapur	Valgaon	1.64	-
334	Rajapur	Valgaon	0.12	-
335	Rajapur	Valgaon	0.4	-
336	Rajapur	Varchi Wadi	0.07	-
337	Rajapur	Vatul	1.2	-
338	Rajapur	Vatul	0.07	-
339	Rajapur	Vatul	1.05	-
340	Rajapur	Vatul	6.98	Jakha devi
341	Rajapur	Vikhare Gothane	0.06	-
342	Rajapur	Yashvantgad	0.08	-
343	Rajapur	Yelvat	0.4	
344	Rajapur	Yelvat	0.38	
345	Rajapur	Yelvat	0.74	
346	Rajapur	Zarye	2.19	Adhishtha
347	Rajapur	Zavaleshwar	6.3	-
348	Rajapur	Zavaleshwar	0.03	-
349	Rajapur	Zavaleshwar	0.02	-

4 G: Sangameshwar Taluka:

Sr. No.	Taluka	Nearest Village	Area (Ha.)	Diety
1	Sangameshwar	Adawadh	25	Unapdev
2	Sangameshwar	Ambay	0.2	Unknown
3	Sangameshwar	Ambay	0.4	Graveyard
4	Sangameshwar	Ambay	0.2	Sati
5	Sangameshwar	Ambay	0.2	Kalishree

6	Sangameshwar	Ambavli	0.1	Inam Land
7	Sangameshwar	Ambavli	0.1	Graveyard
8	Sangameshwar	Ambavli	0.75	Temple Forest
9	Sangameshwar	Ambed Kd.	Unknown	Yashwant Devi
10	Sangameshwar	Angavali	0.85	Someshwar
11	Sangameshwar	Angavali	0.8	Vithabai
12	Sangameshwar	Angavali	0.1	Shankar
13	Sangameshwar	Angavali	0.12	Graveyard
14	Sangameshwar	Arvali	0.2	Kedarnath
15	Sangameshwar	Bamgane	0.8	Akardevi
16	Sangameshwar	Bamgane	0.6	Akardevi
17	Sangameshwar	Bamnoli	0.35	Mahartal
18	Sangameshwar	Bamnoli	0.65	Vitthal
19	Sangameshwar	Bamnoli	0.4	Waghin
20	Sangameshwar	Belari	1.7	Shnkar
21	Sangameshwar	Bhadkhamba	0.4	Kedarling
22	Sangameshwar	Bhovde	0.4	Boreshwar
23	Sangameshwar	Dakkhan	0.2	Chire Khan
24	Sangameshwar	Devde	30	Mhasoba
25	Sangameshwar	Devde	0.8	Shankar
26	Sangameshwar	Dhamni	1.2	Waghjai
27	Sangameshwar	Dongani	0.8	Kedareshwar
28	Sangameshwar	Golavli	Unknown	Chandika
29	Sangameshwar	Gothane	18.37	-
30	Sangameshwar	Gothane	16.47	-
31	Sangameshwar	Hativ	7.8	Kalishree
32	Sangameshwar	Hativ	1	Gaondev
33	Sangameshwar	Hativ	0.8	Graveyard
34	Sangameshwar	Karambel	0.2	Gaondev
35	Sangameshwar	Karambele	0.8	Shankar
36	Sangameshwar	Karli	0.5	Vitthaladevi
37	Sangameshwar	Kasarkolvan	0.6	Shankar
38	Sangameshwar	Khadi Kolwan	0.8	Gangeshwar
39	Sangameshwar	Kinjale	0.3	Bajibua
40	Sangameshwar	Kinjale	0.6	Shankar
41	Sangameshwar	Kinjale	13	Gaondev
42	Sangameshwar	Kirbet	1.8	Vitthal
43	Sangameshwar	Kirbet	2.6	Jagaidevi
44	Sangameshwar	Kirduve	0.8	Shankar

45	Sangameshwar	Kirduve	0.8	Shankar
46	Sangameshwar	Kodasurde	0.8	Mahalaxmi
47	Sangameshwar	Kondgaon	6	Gangoba
48	Sangameshwar	Kosumb	2.4	Jagaidevi
49	Sangameshwar	Kulewasti	0.3	Shankar
50	Sangameshwar	Kumbharkhani	0.1	Waghjai
51	Sangameshwar	Kumbharkhani	0.1	Markoba
52	Sangameshwar	Kumbharkhani	0.4	Waghjaidevi
53	Sangameshwar	Kundi	1	Kedarling
54	Sangameshwar	Lovle	2.4	Shankar
55	Sangameshwar	Morde	0.4	Raghoba
56	Sangameshwar	Maral	100	Marleshwar
57	Sangameshwar	Maral	0.87	Gaondev
58	Sangameshwar	Murday	0.6	Dev
59	Sangameshwar	Murshi	0.4	Gaondev
60	Sangameshwar	Murshi	0.45	Shemba
61	Sangameshwar	Murshi	unknown	Jyotirling
62	Sangameshwar	Murudpur	0.2	Graveyard
63	Sangameshwar	Murudpur	0.2	Dhaninbai
64	Sangameshwar	Nandlaj	0.4	Gaondev
65	Sangameshwar	Ninave	0.6	Fokra
66	Sangameshwar	Nive Bk.	1	Gangoba
67	Sangameshwar	Nive Bk.	0.8	Gaondev
68	Sangameshwar	Nive Bk.	2	Gangoba
69	Sangameshwar	Nive Bk.	1	Gangoba
70	Sangameshwar	Ozre Bk.	Unknown	Kedarling
71	Sangameshwar	Pangri	0.8	Inam Forest
72	Sangameshwar	Patgaon	0.8	Shankar
73	Sangameshwar	Sakharpa	8.85	Jugaidevi
74	Sangameshwar	Sakharpa	0.9	Ninavidevi
75	Sangameshwar	Sakharpa Kh.	0.2	Nageshwar
76	Sangameshwar	Sangve	0.8	Shankar
77	Sangameshwar	Shinde Ambere	0.4	Chandika
78	Sangameshwar	Terhe	0.6	Dev
79	Sangameshwar	Tulsani	4.5	Ravlnath
80	Sangameshwar	Turai	0.6	Vardani
81	Sangameshwar	Ujgaon	0.4	Chalkeshwar
82	Sangameshwar	Ujgaon	0.8	Graveyard
83	Sangameshwar	Ujgaon	0.4	Kshetrapal

84	Sangameshwar	Vanzole	0.2	Chandika
85	Sangameshwar	Vanzole	0.5	Kedarling
86	Sangameshwar	Vanzole Kd.	0.4	Jugai
87	Sangameshwar	Washi	0.95	Ninavidevi

TABLE-5: Plant List of Sacred Groves (SGs) of Ratnagiri district and adjoining forests

Sr. No.	Name of Plant	Family	Common Name	Habit
1	<i>Abrus precatorius</i> L.	Fabaceae	Gunj	Cl
2	<i>Acacia auriculiformis</i> A. Cunn.	Mimosaceae	Australian Babhul	T
3	<i>Acacia concinna</i> DC.	Mimosaceae	Shikekai	CS
4	<i>Achyranthes aspera</i> L.	Amaranthaceae	Aghada	S
5	<i>Acacia chundra</i> (Roxb.) Wild.	Mimosaceae	Sundara	T
6	<i>Adhatoda vasica</i> L.	Acanthaceae	Adulasa	S
7	<i>Adelocaryum coelestinum</i> (Lindl.) Brand	Boraginaceae	-	H
8	<i>Aegle marmelos</i> Corr.	Rutaceae	Bel	T
9	<i>Aeginetia indica</i> L.	Orobanchaceae	-	P
10	<i>Aerides crispa</i> Lindl.	Orchidaceae	-	EH
11	<i>Aerides dalzelliana</i> (Santapau) Garay	Orchidaceae	-	EH
12	<i>Aerides maculosum</i> Lindl.	Orchidaceae	-	EH
13	<i>Ageratum cpnyzoides</i> L.	Asteraceae	-	H
14	<i>Allophylus cobbe</i> (L.) Raeusch	Sapindaceae	Tiphan, Tipani	SS
15	<i>Albizia lebbeck</i> Benth.	Mimosaceae	Shirish	T
16	<i>Albizia procera</i> (Roxb.) Benth.	Mimosaceae	Kinhai	T
17	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Satvin, Saptaparni	T
18	<i>Alternanthera sessilis</i> (L.) R.Br.	Amaranthaceae	Kate chibuk	H
19	<i>Ammania buccifera</i> L.	Lythraceae	-	H
20	<i>Amorphophallus commutatus</i> (Schott) Engl. in DC.	Araceae	Suran	BH
21	<i>Amorphophallus konkanensis</i> W.L.A. Hettterscheid, S.R. Yadav & K.S. Patil	Araceae	Suran	BH
22	<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Vitaceae	-	SS
23	<i>Ampelocissus tomentosa</i> (Roxb.) Planch.	Vitaceae	-	SS
24	<i>Amorphophallus peoniifolius</i> (Dennst.) Nicolson	Araceae	-	BH
25	<i>Anacardium occidentale</i> L.	Anacardiaceae	Kaju	T

26	<i>Ancistrocladus heyneanus</i> Wall. ex J. Graham	Ancistrocladaceae	Hik Vel	SS
27	<i>Antiaris toxicaria</i> Lesch.	Moraceae	-	T
28	<i>Anogeissus latifolia</i> Wall.	Combretaceae	Dhawada	T
29	<i>Arisaema caudatum</i> Engl.	Araceae	Sapkanda	BH
30	<i>Argemone maxicana</i> L.	Papaveraceae	Pivala Dhotra	H
31	<i>Argyreia nervosa</i> (Burm.f.) Bhandari	Convolvulaceae	-	Cl
32	<i>Argyreia involucrata</i> C.B.Cl.	Convolvulaceae	Samdurashok	Cl
33	<i>Arisaema murrayi</i> (J. Graham) Hook.	Araceae	Sapkanda	BH
34	<i>Arthraxon jubatus</i> Hack.	Poaceae	-	H
35	<i>Arthraxon lanceolatus</i> Hochst.	Poaceae	-	H
36	<i>Arundinella ciliata</i> Nees ex Miq.	Poaceae	-	H
37	<i>Arundinella leptochloa</i> (Nees ex Steud.) Hook. f.	Poaceae	-	H
38	<i>Arundinella metzii</i> Hochst. ex Miq.	Poaceae	-	H
39	<i>Artocarpus heterophyllus</i> Lamk.	Moraceae	Phanas	T
40	<i>Artocarpus lakoocha</i> Roxb.	Moraceae	Lakooch	T
41	<i>Asparagus arecemosus</i> var. <i>javanicus</i> (Kunth.) Baker	Asparagaceae	Shatavari	C
42	<i>Aspidopterys cordata</i> A. Juss.	Malpigiaceae	-	SS
43	<i>Asystasia dalzelliana</i> Santapau	Acanthaceae	-	S
44	<i>Atlantia racemosa</i> Wight	Rutaceae	Makad Limbu	T
45	<i>Beaumontia jerdoniana</i> Wight	Apocynaceae	-	L
46	<i>Barringtonia acutangula</i> (L.) Gaertn.	Barigntoniaceae	Samudra Ashok	T
47	<i>Bauhinia racemosa</i> Lamk.	Caesalpiniaceae	Kanchan	T
48	<i>Begonia crenata</i> Drynad.	Begoniaceae	-	H
49	<i>Biophytum sensitivum</i> (L.) DC.	Oxalidaceae	Lajvanti	H
50	<i>Blumia lacera</i> (N.Burm.) DC.	Asteraceae	-	H
51	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Punarnava	H
52	<i>Bombax insigne</i> Wall.	Bombacaceae	Pandhari Sawar	T
53	<i>Bombax ceiba</i> L.	Bombacaceae	Katesawar, Shevari	T
54	<i>Brachiaraiia racemosa</i> (L.) Stapf.	Poaceae	-	H

55	<i>Brachystelma malwanense</i> Yadav & N.P. Singh	Asclepiadaceae	Samudraphal	T
56	<i>Brassica juncea</i> Hook.	Brassicaceae	Mohari	H
57	<i>Bridelia montana</i> (Roxb.) Willd.	Euphorbiaceae	Katak	T
58	<i>Buchanania lanzan</i> Spreng.	Anacardiaceae	Charoli	T
59	<i>Bulbophyllum fimbriatum</i> (Lindl.) Rchb. f.	Orchidaceae	-	E
60	<i>Bulbophyllum neilgherrense</i> Wight	Orchidaceae	-	E
61	<i>Butea monosperma</i> (Lamk.) Jaub.	Fabaceae	Palas	T
62	<i>Calacanthus grandiflorus</i> (Dalzell) Radlk.	Acanthaceae	-	S
63	<i>Careya arborea</i> Roxb.	Lecythidaceae	Kumbha	T
64	<i>Cassia fictula</i> L.	Caesalpiniaceae	Amaltas, Bahava	T
65	<i>Catuneregam spinosa</i> (Thunb.) Triveng.	Rubiaceae	Alu	T
66	<i>Carissa carandas</i> L.	Apocynaceae	Karvand	SS
67	<i>Canthium angustifolium</i> Roxb.	Rubiaceae	Tupa	T
68	<i>Canthium diccocum</i> (Gaertn.) Teys. & Binn. var. <i>umbellatum</i> (Wt.) Sant. & Merch	Rubiaceae	Tupa	H
69	<i>Carallia brachiata</i> Lour.	Rhizophoraceae	Phanashi	T
70	<i>Carissa inermis</i> Vahl.	Apocynaceae	Motha Karvand	SS
71	<i>Calophyllum inophyllum</i> L.	Clusiaceae	Undi	T
72	<i>Calotropis procera</i> R.Br.	Asclepiadaceae	Rui	S
73	<i>Calotropis gigantia</i> (L.) R. Br.	Asclepiadaceae	Rui, Mandar	S
74	<i>Capparis moonii</i> Wight.	Capparidaceae	Caper	SS
75	<i>Caryota urens</i> L.	Arecaceae	Bherlimad	T
76	<i>Cassine glauca</i> (Rottb.) Kuntze.	Celstraceae	Datrang	S
77	<i>Cassia tora</i> L.	Caesalpiniaceae	Takal	H
78	<i>Casearia championii</i> Thwaites	Flacourtiaceae	-	S
79	<i>Celosia argentia</i> L.	Amaranthaceae	Kurdu	H
80	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Mandukparni	H
81	<i>Celastrus paniculatus</i> Willd.	Celastraceae	Vavding	SS
82	<i>Calycopteris floribunda</i> L.	Combretaceae	Ukashi, Uski	SS

83	<i>Canscora decurrens</i> Dalz.	Gentianaceae	-	H
84	<i>Canscora diffusa</i> (Vahl.) R.Br.	Gentianaceae	-	H
85	<i>Cansjera rheedii</i> Gmel.	Oleaceae	-	Cl
86	<i>Ceropegia attenuata</i> Hook.	Asclepiadaceae	Hanuman Batata	H
87	<i>Ceropegia media</i> (H. Huber) Ansari	Asclepiadaceae	Hanuman Batata	Cl
88	<i>Ceropegia oculata</i> Hook.	Asclepiadaceae	Kharpudi	Cl
89	<i>Ceropegia vincaefolia</i> Hook.	Asclepiadaceae	Kandilpushpa	Cl
90	<i>Chlorophytum breviscapum</i> Dalzell	Liliaceae	Musali	H
91	<i>Chlorophytum glaucoides</i> Blatt.	Liliaceae	Musali	H
92	<i>Chlorophytum glaucum</i> Dalzell	Liliaceae	Musali	H
93	<i>Cissus woodrowii</i> (Satpf. Ex T. Cooke) Sant.	Vitaceae	-	SS
94	<i>Clausena anisata</i> (Wild.) Hook.f. Benth.	Rutaceae	Datrang	S
95	<i>Clematis gouriana</i> Roxb. ex DC.	Ranunculaceae	Morvel	Cl
96	<i>Colebrookia oppositifolia</i> Smith	Lamiaceae	Baman	S
97	<i>Colocasia esculanta</i> (L.) Schott	Araceae	Alu	BH
98	<i>Combretum elatifolium</i> Blume	Combretaceae	-	SS
99	<i>Commelina benghalensis</i> L.	Commelinaceae	-	H
100	<i>Conyza stricta</i> Willd.	Asteraceae	-	H
101	<i>Costus speciosus</i> (Koen.) Smith	Costaceae	-	H
102	<i>Crataeva religiosa</i> Auct. Non Frost.	Capparidaceae	Vayvarna	T
103	<i>Crotalaria verrucosa</i> L.	Fabaceae	Bhat Ghagri	S
104	<i>Crotalaria juncea</i> L.	Fabaceae	Khulkhula	S
105	<i>Crinum latifolium</i> L.	Amaryllidaceae	-	BH
106	<i>Cryptocoryne cognata</i> Schott	Araceae	-	H
107	<i>Cucumis richiei</i> (Chakr.) Jeffrey	Cucurbitaceae	-	Cl
108	<i>Cucumis maderaspatanus</i> L.	Cucurbitaceae	Chirati, Chirbut	Cl
109	<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	Kali Musali	H
110	<i>Curcuma indodora</i> Blatt.	Zingiberaceae	Jangali halad	H
111	<i>Curcuma neilgherrensis</i> Wight	Zingiberaceae	-	H
112	<i>Curcuma pseudomontana</i> J. Graham	Zingiberaceae	Kachora	H

113	<i>Cyclea peltata</i> (Lamk.) Hk.f. & Thoms.	Menispermaceae	-	Cl
114	<i>Cyanotis concanensis</i> Hassk.	Commelinaceae	-	H
115	<i>Cyperus metzii</i> (Hochst.) Mattf.	Cyperaceae	-	H
116	<i>Cyanotis fasciculata</i> var. <i>glabrescens</i> C.B. Cl	Commelinaceae		H
117	<i>Dalbergia horrida</i> (Dennst.) Mabb.	Fabaceae	-	L
118	<i>Dendrobium aqueum</i> Lindl.	Orchidaceae	-	E
119	<i>Dendrobium barbatulum</i> Lindl.	Orchidaceae	Ratnapurush	E
120	<i>Dendrobium microbulbon</i> A. Rich.	Orchidaceae		E
121	<i>Dendrobium ovatum</i> L. Kraenzl.	Orchidaceae		-
122	<i>Dendrophthoe falcata</i> (L.f.) Etting.	Loranthaceae	-	P
123	<i>Derris scandens</i> (Roxb.) Benth.	Fabaceae	-	CS
124	<i>Desmodium triflorum</i> (L.) DC	Fabaceae	Ran-methi	H
125	<i>Dillenia indica</i> L.	Dilleniaceae	Karmal	T
126	<i>Dillenia pentagyana</i> Roxb.	Dilleniaceae	Karamal, Piwala Karamal	T
127	<i>Dimorphocalyx lawianus</i> (Mull. Arg.) Hook. f.	Euphorbiaceae	-	T
128	<i>Dioscoria bulbifera</i> L.	Dioscoriaceae	Dukkar Kand	CS
129	<i>Dioscoria pentaphylla</i> L.	Dioscoriaceae	Dukkar Kand	CS
130	<i>Diploclisia glaucescens</i> (Bl.) Diels	Menispermaceae	Vatoli	L
131	<i>Dipcadi konkanensis</i> (Dalze) Baker	Liliaceae	-	H
132	<i>Dipcadi maharashtrense</i> Deb & S.Dasgupta	Liliaceae	-	H
133	<i>Diospyros candolleana</i> Wt.	Ebenaceae	Kalingan	T
134	<i>Diospyros montana</i> Roxb.	Ebenaceae	-	T
135	<i>Diospyros nigrescens</i> (Dalzell) C. J. Saldanha	Ebenaceae	-	T
136	<i>Drosera indica</i> L.	Droseraceae	-	H
137	<i>Embelia basal</i> (R.&S.) A.DC.	Myrsinaceae	Vavding	CS
138	<i>Ensete superbum</i> (Roxb.) Cheesm.	Musaceae	Rankel	H
139	<i>Entada scandens</i> (L.) Benth	Mimosaceae	Garambi	L
140	<i>Eranthemum roseum</i> (Vahl.) R.Br.	Acanthaceae	Nili Aboli	S
141	<i>Eria dalzellii</i> (Hook. ex Dalzell)	Orchidaceae	-	E

	Lindl.			
142	<i>Eria exilis</i> Hook.f.	Orchidaceae	-	E
143	<i>Eria reticosa</i> Wight	Orchidaceae	-	E
144	<i>Erinocarpus nimmonii</i> J. Graham ex Dalzell	Tiliaceae	Cher, Chawara	T
145	<i>Eriocaulon cuspidatum</i> Dalzell	Eriocaulaceae	-	H
146	<i>Eriocaulon dalzellii</i> Korn.	Eriocaulaceae	-	H
147	<i>Eriocaulon minutum</i> Hook. f.	Eriocaulaceae	-	H
148	<i>Eriocaulon sedgwickii</i> Fyson	Eriocaulaceae	-	H
149	<i>Eriocaulon tuberiferum</i> A. R. Kulk. & Desai	Eriocaulaceae	-	H
150	<i>Ervatamia alternifolia</i> (L.) S. M. Almeida	Eriocaulaceae	Nagchafa	T
151	<i>Erythrina varigata</i> L.	Fabaceae	Pangara	T
152	<i>Eulophia ochreatea</i> Lindl.	Euphorbiaceae	-	BH
153	<i>Eupatorium rependum</i> Willd.	Acanthaceae	-	S
154	<i>Euphorbia antiquorum</i> L.	Euphorbiaceae	-	S
155	<i>Euphorbia concanensis</i> Janarthanam & Yadav	Euphorbiaceae	-	H
156	<i>Euphorbia fusiformis</i> Buch-Ham. ex Don.	Euphorbiaceae	Bhuishirid	H
157	<i>Evolvulus alsenoides</i> (L.) L.	Convolvulaceae	Vishnukranta	H
158	<i>Ficus arnottiana</i> (Miq.) Miq.	Moraceae	Paras Pimpal	T
159	<i>Ficus microcarpa</i> L.	Moraceae	Nandruk	T
160	<i>Ficus hispida</i> L.f.	Moraceae	Kala Umbar	T
161	<i>Ficus tsjahela</i> N.L. Barman	Moraceae	Kel	T
162	<i>Ficus racemosa</i> L.	Moraceae	Umbar, Audambar	T
163	<i>Ficus religiosa</i> L.	Moraceae	Pimpal	T
164	<i>Ficus benghalensis</i> L.	Moraceae	Vad	T
165	<i>Flacourtia montana</i> J. Graham	Flacourtiaceae	Tambat	T
166	<i>Flemingia gracilis</i> (Mukerjee) Ali	Fabaceae	-	H
167	<i>Garcinia indica</i> (Thou.) Choisy.	Clusiaceae	Kokam, Amsul	T
168	<i>Geissaspis tenella</i> Benth.	Fabaceae	-	H
169	<i>Girardinia diversifolia</i> (Link.) Fiis	Urticaceae	Khajkhujali	S

170	<i>Gliricidia maculata</i> H.B.K.	Fabaceae	Undirmari	T
171	<i>Glochidion ellipticum</i> Wight	Euphorbiaceae	Bhoma	T
172	<i>Gloriosa superba</i> L.	Colchicaceae	Kal-lawi, Agnishikha	Cl
173	<i>Gnetum ula</i> Roxb.	Gnetaceae	Ombal	L
174	<i>Grewia tiliaefolia</i> Vahl.	Tiliaceae	Dhaman	T
175	<i>Grewia asiatica</i> L.	Tiliaceae	Phalasa	T
176	<i>Gymnema khandalensis</i> Santapau	Asclepiadaceae	-	L
177	<i>Gymnema sylvestre</i> R.Br.	Apocynaceae	Madhunashi, Bedakicha Pala	Cl
178	<i>Glycosmis pentaphylla</i> (Retz.) DC	Clusiaceae	-	S
179	<i>Glyphochloa acuminata</i> var. <i>stocksii</i> (Hook.f.) W.D. Clayton	Poaceae	-	H
180	<i>Habenaria crassifolia</i> A. Rich.	Orchidaceae	-	H
181	<i>Habenaria grandifloriformis</i> Blatt. & McC.	Orchidaceae	Bhui Amari	H
182	<i>Habenaria heyneana</i> Lindl.	Orchidaceae	-	H
183	<i>Haldina cordifolia</i> (Roxb.) Ridsdale	Rubiaceae	Kalam	T
184	<i>Helecteres isora</i> L.	Sterculiaceae	Murudsheng	S
185	<i>Heterophragma quadriloculare</i> (Roxb.) K. Schum.	Bignoniaceae	Varas	T
186	<i>Hiptage benghalensis</i> (L.) Kurz.	Malphiaceae	Madhumalati	CS
187	<i>Holigarna arnotiana</i> Hk.f.	Anacardiaceae	Ranbiba	T
188	<i>Homonoia riparia</i> Lour.	Euphorbiaceae	Ran Kanher	S
189	<i>Hoya wightii</i> Hook.	Asclepiadaceae	Ambari, Dudhvel	E
190	<i>Hydnocarpus pentandrus</i> (Buch.- Ham.) Oken	Flacourtiaceae	Kadukavath	T
191	<i>Hymenodictyon obovatum</i> Wall.	Rubiaceae	Bhorsal	T
192	<i>Impatiens balsamina</i> L.	Balsaminaceae	Terada	H
193	<i>Impatiens minor</i> (DC.) Bennet	Balsaminaceae	Terada	H
194	<i>Impatiens pulcherrima</i> Dalzell	Balsaminaceae	Dhalterada	H
195	<i>Indopoa paupercula</i> (Stapf) Bor	Poaceae	-	H
196	<i>Indigofera linifolia</i> (L. f.) Retz.	Fabaceae	-	S
197	<i>Iphigenia magnifica</i> M.Y.Ansari & R.S.Rao	Colchicaceae	-	H

198	<i>Iphigenia stellata</i> Blatt.	Colchicaceae	-	H
199	<i>Ixora brachiata</i> Roxb.	Rubiaceae	Malava	S
200	<i>Ixora coccinia</i> L.	Rubiaceae	Ishvari	S
201	<i>Jasminum malabaricum</i> Wight	Oleaceae	Ranjai	SS
202	<i>Justicia glauca</i> Rottl.	Acanthaceae	-	H
203	<i>Justicia trinervia</i> Vahl	Acanthaceae	-	H
204	<i>Kalanchoe pinnata</i> (Lamk.) Pers.	Crassulaceae	Panphuti	H
205	<i>Kydia calycina</i> Roxb.	Malvaceae	Varang	T
206	<i>Lagerstroemia microcarpa</i> Wt.	Lythraceae	Nana	T
207	<i>Lamprachaenium microcephalum</i> (Dalz.) Bth.	Asteraceae	-	H
208	<i>Lanea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	Moi, Shimati	T
209	<i>Leea indica</i> (Burm.f.) Merr.	Leeaceae	Dinda	S
210	<i>Leea macrophylla</i> Roxb. ex Hornem	Leeaceae	Motha Dinda	S
211	<i>Lepidagathis cuspidata</i> Nees	Acanthaceae	-	H
212	<i>Lepidagathis lutea</i> Dalzell	Acanthaceae	Godhadi	H
213	<i>Leucas ciliata</i> Benth.	Lamiaceae	-	H
214	<i>Lepidagathis mitis</i> Dalz.	Acanthaceae	-	H
215	<i>Linum mysorensis</i> Heyne	Linaceae	-	H
216	<i>Maesa indica</i> (Roxb.) DC.	Myrsinaceae	Atak, Ataki	SS
217	<i>Macaranga peltata</i> Roxb. Mueller	Euphorbiaceae	Chandada	T
218	<i>Malaxis versicolor</i> (Lindl.) Abeyw.	Orchidaceae	-	H
219	<i>Mallotus aureopunctatus</i> (Dalzell) Mull.-Arg.	Euphorbiaceae	Shendri	T
220	<i>Mangifera indica</i> L.	Anacardiaceae	Amba	T
221	<i>Maytenus rothiana</i> (Walp.) Lobreau-Callen	Celastraceae	Henkal	T
222	<i>Memecylon umbellatum</i> Burm f.	Melastomataceae	Anjani	T
223	<i>Michelia champaca</i> L.	Magnoliaceae	Piwala Chafa	T
224	<i>Mimusops elengi</i> L.	Sapotaceae	Bakul	T
225	<i>Mucuna pruriens</i> (L.) DC	Fabaceae	Khajkhujali	CL
226	<i>Murraya koengii</i> (L.) Spr.	Rutaceae	Kadipatta	SS

227	<i>Murdannia lanuginosa</i> (Wall. ex C.B. Cl.) Brueck.	Commelinaceae	-	H
228	<i>Murdannia versicolor</i> Bruckner	Commelinaceae	-	H
229	<i>Myristica dactyloides</i> Gaertn.	Myristicaceae	Jaiphal	T
230	<i>Neanotis lancifolia</i> (Hook. f.) W. H. Lewis	Rubiaceae	-	H
231	<i>Neolarkia cadamba</i> (Roxb.) Bosser	Rubiaceae	Kadamba	T
232	<i>Nervilia prainiana</i> (King & Pantl.) Seidenf.	Orchidaceae	-	H
233	<i>Neanotis montholoni</i> (Hook. f.) W. H. Lewis	Rubiaceae	-	H
234	<i>Moullava spicata</i> (Dalzell) D. H. Nicolson	Caesalpiniaceae	Waghathi	SS
235	<i>Neuracanthus sphaerostachyus</i> (Nees) Dalzell	Asteraceae	-	S
236	<i>Nothopogia racemosa</i> (Dalz.) Ramamurthy	Anacardiaceae	Amberi	T
237	<i>Ophioglossum fibrosum</i> Schum.	Ophioglossaceae	-	H
238	<i>Oldenlandia stocksii</i> Hook. f.	Rubiaceae	-	S
239	<i>Olea dioeca</i> Roxb.	Oleaceae	Parjambhul	T
240	<i>Oroxylum indicum</i> (L.) Vent.	Bignoniaceae	Tetu	T
241	<i>Pancratium parvum</i> Dalz.	Amaryllidaceae	-	BH
242	<i>Pavetta indica</i> L.	Rubiaceae	Phapat	S
243	<i>Paracaryopsis malabarica</i> (C.B.Clarke) R.R.Mill	Boraginaceae	-	S
244	<i>Peristylus aristatus</i> Lindl.	Orchidaceae	-	H
245	<i>Persicaria auriculata</i> (Meisn.) S.K.Dixit et.al.	Polygonaceae	-	H
246	<i>Peristylus stocksii</i> (Hook.f.) Kranzl.	Orchidaceae	-	H
247	<i>Physalis minima</i> L.	Solanaceae	-	H
248	<i>Pimpinella adscendens</i> Dalz.	Apiaceae	-	S
249	<i>Piper nigrum</i> L.	Piperaceae	Mirvel	Cl
250	<i>Pleocaulis sessilis</i> (Nees) Bremek.	Acanthaceae	-	S
251	<i>Pleocaulis ritchiei</i> (C. B. Clarke) Bremek.	Acanthaceae	Karvi	S
252	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Chittrak	SS
253	<i>Plumeria rubra</i> L.	Apocynaceae	Chafa	T

254	<i>Pogostemon deccanensis</i> (Panigrahi) Press	Lamiaceae	-	H
255	<i>Polygonum chinense</i> L.	Polygonaceae	-	H
256	<i>Porpax reticulata</i> Lindl.	Orchidaceae	-	H
257	<i>Rauvolfia serpentina</i> (L.) Benth ex Kurz.	Apocynaceae	Sarpagandha	S
258	<i>Remusatia vivipara</i> (Roxb.) Schott	Araceae	Rukhalu	BH
259	<i>Rhamphicarpa longiflora</i> (Arn.) Bth.	Scrophulariaceae	-	H
260	<i>Rotala malampuzhensis</i> Nair ex C.D.K. Cook	Lythraceae	-	H
261	<i>Rotala ritchei</i> Koehne	Lythraceae	-	H
262	<i>Rubia cordifolia</i> L.	Rubiaceae	Manjistha	Cl
263	<i>Sapium insigne</i> (Royle) Trimen	Euphorbiaceae	Hura	H
264	<i>Scutia myrtina</i> (Burm. f.) Kurz	Rhamnaceae	Masati	SS
265	<i>Senecio belgaumensis</i> (Wight) C. B. Clarke	Asteraceae	Soanaki	H
266	<i>Senecio bombayensis</i> N. P. Balakr.	Asteraceae	Sonaki	H
267	<i>Smilax zeylanica</i> L.	Smilacaceae	Ghotvel	CL
268	<i>Smithia bigemina</i> Dalzell	Fabaceae	-	S
269	<i>Solanum nigrum</i> L.	Solanaceae	-	H
270	<i>Sopubia delphinifolia</i> G. Don	Orobanchaceae	-	H
271	<i>Spaeranthus indicus</i> L.	Asteraceae	Gorakhmundi	H
272	<i>Sterculia colorata</i> Roxb.	Sterculiaceae	Kavashi	T
273	<i>Sterculia foetida</i> L.	Sterculiaceae	Goldaru, Jangali Badam	T
274	<i>Sterculia urens</i> Roxb.	Sterculiaceae	Karaya, Bhutya	T
275	<i>Strobilanthes callosa</i> (Nees) Bremek.	Acanthaceae	Karvi	S
276	<i>Strobilanthes ixiocephala</i> Benth.	Acanthaceae	Karvi	S
277	<i>Strychnos minor</i> Dennst.	Loganaceae	-	S
278	<i>Strychnos nux-vomica</i> L.	Loganaceae	Kajara	T
279	<i>Strobilanthes lupulina</i> Nees	Acanthaceae	Karvi	S
280	<i>Swertia minor</i> (Griseb.) Knobl.	Gentianaceae	-	H
281	<i>Syzygium cumini</i> (L.) Skill.	Myrtaceae	Jambhul	T
282	<i>Syzygium laetum</i> (Buch.-Ham.)	Myrtaceae	Jambhul	S

	Gandhi			
283	<i>Tectona grandis</i> L.f.	Lamiaceae	Sag	T
284	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun	T
285	<i>Terminalia elliptica</i> Willd.	Combretaceae	Ain	T
286	<i>Terminalia bellerica</i> (Gaertn.) Roxb.	Combretaceae	Beheda	T
287	<i>Terminalia chebula</i> Retz.	Combretaceae	Hirada	T
288	<i>Terminalia paniculata</i> Roth	Combretaceae	Kinjal	T
289	<i>Thespecia populnia</i> Soland.	Malvaceae	Bhendi	T
290	<i>Tolypanthus lagenifer</i> (Wight) Tiegh.	Loranthaceae	-	P
291	<i>Tridax procumbens</i> L.	Asteraceae	Dagadi Pala	H
292	<i>Triemfetta rhomboidea</i> Lam.	Tiliaceae	-	H
293	<i>Utricularia albocaerulea</i> Dalzell	Lentibulariaceae	-	H
294	<i>Utricularia praeterita</i> P. Taylor	Lentibulariaceae	-	H
295	<i>Utricularia purpurascens</i> Grah.	Lentibulariaceae	-	H
296	<i>Vanda testacea</i> (L.) Lidl.	Orchidaceae	-	EH
297	<i>Viscum angulatum</i> Heyne	Viscaceae	-	EH
298	<i>Vitex negundo</i> L.	Verbenaceae	Nirgudi	S
299	<i>Wendlandia thyrsoidea</i> (Schult.) Steud.	Rubiaceae	-	S
300	<i>Woodfordia fruticosa</i> (L.) Kurz.	Lythraceae	Dhayati	SS
301	<i>Wrightia tinctoria</i> R.Br.	Apocynaceae	Kala-Kuda	S
302	<i>Wiesneria triandra</i> (Dalz.) Micheli	Alismataceae	-	S
303	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	Rutaceae	Chirphal	T
304	<i>Zingiber neesanum</i> (J. Graham) Ramamoorthy	Zingiberaceae	Ran Ale	H
305	<i>Ziziphus rugosa</i> Lam.	Rhamnaceae	Toran	SS
306	<i>Ziziphus oeniplea</i> Mill.	Rhamnaceae	Torani	SS

Table-6: Habit-wise Species Composition of SGs of Ratnagiri district

Habit-wise composition	No. of Species
Bulbous Herb (BH)	10
Climber (Cl)	17
Epiphyte (E)	12
Herbs (H)	106
Liana	5
Parasite (P)	3
Scandent Shrub (SS)	30
Shrub (S)	41
Tree (T)	86

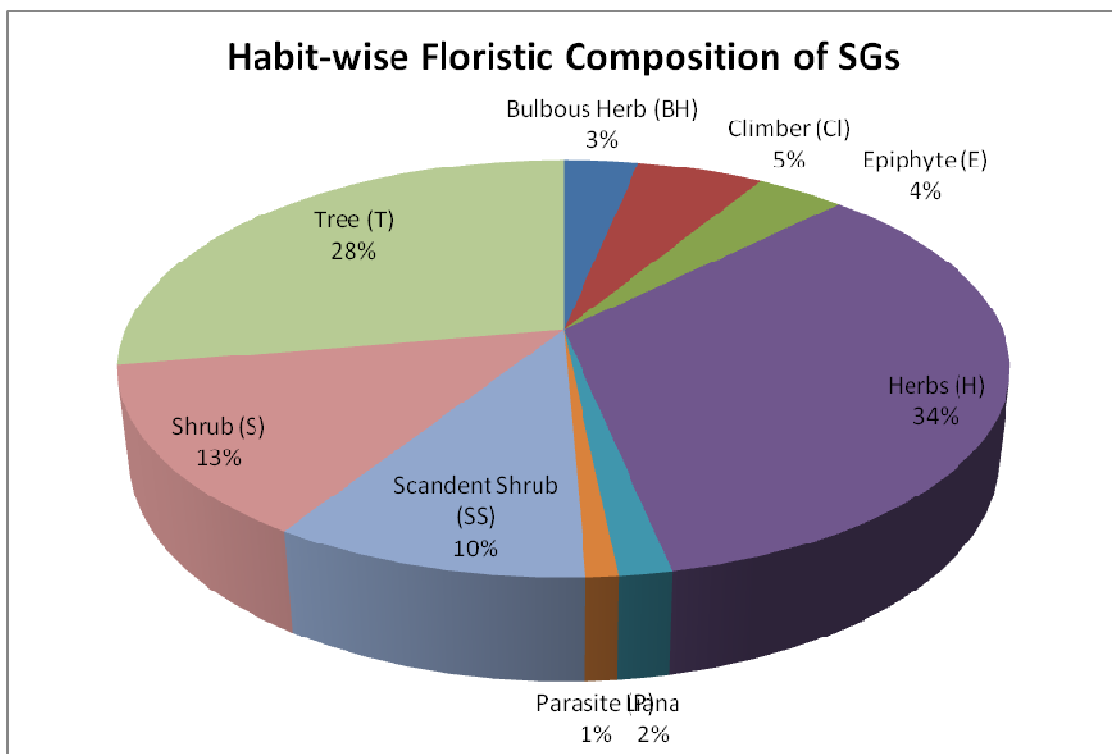


Table-7: Dominent Families found in SGs of Ratnagiri district

Sr. No.	Name of Family	No of Species
1	Acanthaceae	13
2	Apocynaceae	8
3	Asclepiadaceae	9
4	Combretaceae	8
5	Euphorbiaceae	10
6	Fabaceae	13
7	Moraceae	11
8	Orchidaceae	21
9	Rubiaceae	14

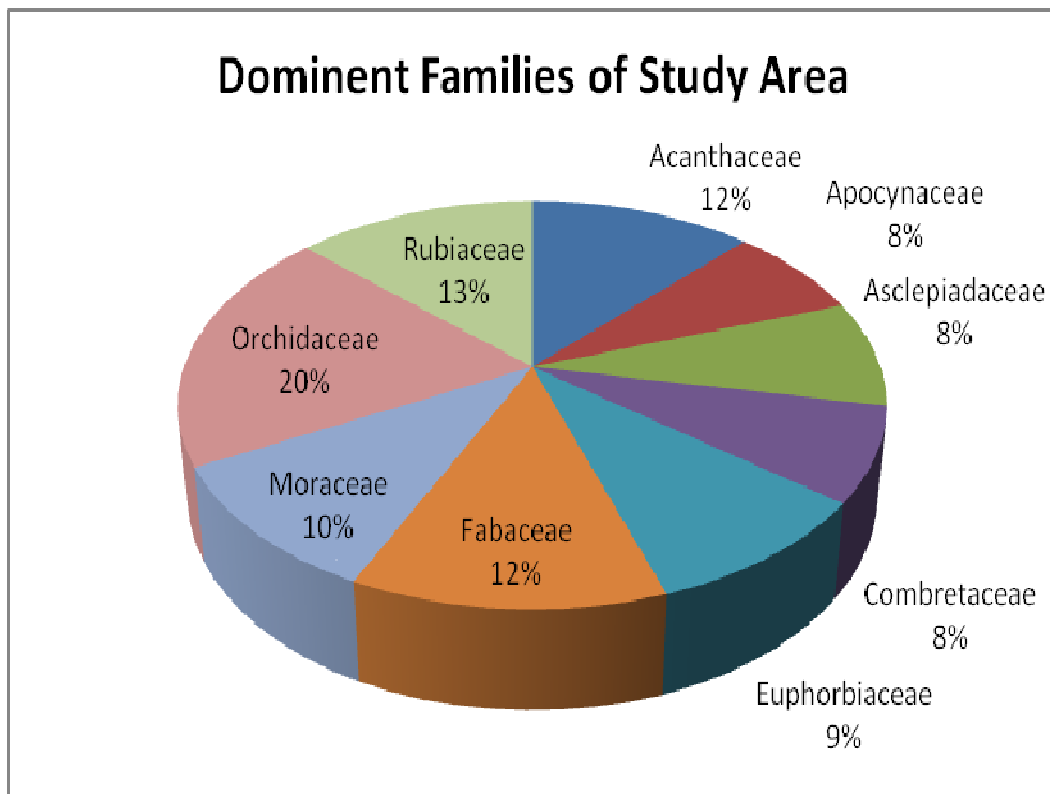


Table 6: Ethnomedicinal Importance of RET Categories Plants:

Sr. No.	Name of Plant	RET Category	Habit	Ethnomedicinal Importance
1.	<i>Aerides crispa</i> Lindl.	Endemic to W.G.	Orchids	Flowers juice utilised as tonic
2.	<i>Aerides dalzelliana</i> (Santapau) Garay	Endemic to W.G.	Orchids	Flowers juice utilised as tonic
3.	<i>Aerides maculosum</i> Lindl.	Endemic to W.G.	Orchids	Flowers juice utilised as tonic
4.	<i>Amorphophallus commutatus</i> (Schott) Engl. in DC.	Endemic to W.G.	Herb	Tubers used as tonic, in piles & dysentery, in acute rheumatism.
5.	<i>Ancistrocladus heyneanus</i> Wall. ex J. Graham	Endemic W.G.	Shrub	Bark used in skin diseaes
6.	<i>Arisaema caudatum</i> Engl.		Herb	Roots useful to kill worms in cattle
7.	<i>Arisaema murrayi</i> (J. Graham) Hook.	Endemic to W.G.	Herb	Corms are medicinal
8.	<i>Aspidopterys cordata</i> A. Juss.	Endemic W.G.	Shrub	Tender branches used in boils
9.	<i>Asystasia dalzelliana</i> Santapau	Endemic to W.G.	Herb	Plant juice useful in rheumatism
10.	<i>Beaumontia jerdoniana</i> Wight	Endemic to W.G.	Liana	Bark is medicinal
11.	<i>Begonia crenata</i> Drynad.	Endemic W.G.	Herb	Leaf juice useful against leech bite.
12.	<i>Brachystelma malwanense</i> Yadav & N.P. Singh	Critically Endangered	Herb	Not known
13.	<i>Bulbophyllum fimbriatum</i> (Lindl.) Rchb. f.	Endemic	Orchids	Flowers juice is medicinal
14.	<i>Bulbophyllum neilgherrense</i> Wight	Endemic to W.G.	Orchids	Pseudobulbs are medicinally important
15.	<i>Calacanthus grandiflorus</i> (Dalzell) Radlk.	Endemic to W.G.	Shrub	-
16.	<i>Ceropegia oculata</i> Hook.	Endemic to W.G.	Climber	Tuberous roots useful as tonic & in digestion.
17.	<i>Ceropegia vincaefolia</i> Hook.	Endemic to W.G.	Climber	Tuberous roots useful as tonic & in digestion.
18.	<i>Chlorophytum breviscapum</i> Dalzell	Endemic to W.G.	Herb	Tubers are medicinal
19.	<i>Cissus woodrowii</i> (Satpf. Ex T. Cooke) Sant.	Endemic W.G.	Shrub	Sap of young leaves are used in skin diseases.
20.	<i>Connarus monocarpus</i> L.	Endemic W.G.	Shrub	Fruit pulp used in eye diseases, bark & wood used in treatment

				of ulcers, oil from roots used for swellings.
21.	<i>Curcuma neilgherrensis</i> Wight	Endemic to W.G.	Herb	Tubers are used as antimicrobial
22.	<i>Curcuma pseudomontana</i> J. Graham	Endemic to W.G.	Herb	Rhizome useful as a form of arrowroot.
23.	<i>Cyanotis concanensis</i> Hassk.	Endemic to W.G.	Herb	Tubers are medicinal
24.	<i>Dalbergia horrida</i> (Dennst.) Mabb.	Endemic W.G.	Liana	Bark is useful to remove pimples.
25.	<i>Dendrobium aqueum</i> Lindl.	Endemic to W.G.	Orchids	Otitismedia (Kanphutane), Gingivites (Dadha Basane), tooth bleeding
26.	<i>Dendrobium barbatulum</i> Lindl.	Endemic to W.G.	Orchids	Stem useful as vegetables.
27.	<i>Dendrobium microbulbon</i> A. Rich.	Endemic to W.G.	Orchids	Flowers are useful as vegetable
28.	<i>Dendrobium ovatum</i> L. Kraenzl.	Endemic	Orchids	Plant juice useful in stomach disorders and it acts as a laxative.
29.	<i>Dimorphocalyx lawianus</i> (Mull. Arg.) Hook. f.	Endemic to W.G.	Tree	-
30.	<i>Dipkadi konkanensis</i> (Dalze) Baker	Endemic	Herb	-
31.	<i>Diospyros nigrescens</i> (Dalzell) C. J. Saldanha	Endemic to W.G.	Tree	-
32.	<i>Ensete superbum</i> (Roxb.) Cheesm.	Endemic to W.G.	Herb	Fruits are edible
33.	<i>Eria dalzellii</i> (Hook. ex Dalzell) Lindl.	Endemic to W.G.	Orchids	-
34.	<i>Eria reticosa</i> Wight	Endemic to W.G.	Orchids	-
35.	<i>Erinocarpus nimmonii</i> J. Graham ex Dalzell	Endemic W.G.	Tree	Fruits are used in local medicines
36.	<i>Eriocaulon cuspidatum</i> Dalzell	Endemic to W.G.	Herb	-
37.	<i>Eriocaulon dalzellii</i> Korn.	Endemic to W.G.	Herb	-
38.	<i>Eriocaulon minutum</i> Hook. f.	Endemic to W.G.	Herb	-
39.	<i>Eriocaulon sedgwickii</i> Fyson	Endemic to W.G.	Herb	-
40.	<i>Eriocaulon tuberiferum</i> A. R. Kulk. & Desai	Endemic to W.G.	Herb	-
41.	<i>Ervatamia alternifolia</i> (L.) S. M. Almeida	Endemic to W.G.	Tree	Fruits and bark is useful in snake bites
42.	<i>Eulophia ochreatea</i> Lindl.	Endemic to W.G.	Orchids	Tubers useful tumors,

				bronchitis & blood diseases.
43.	<i>Flacourtia montana</i> J. Graham	Endemic Pen. India	Tree	Fruits useful in jaundice.
44.	<i>Garcinia indica</i> (Thou.) Choisy.	Endemic W.G.	Tree	Fruits useful in antiscorbutic, cooling. Oil is useful in skin diseases
45.	<i>Glochidion ellipticum</i> Wight	Endemic to W.G.	Tree	Leaves are medicinal
46.	<i>Hydnocarpus pentandrus</i> (Buch.-Ham.) Oken	Endemic Pen. India	Tree	Fruits are medicinally useful in leprosy.
47.	<i>Hymenodictyon obovatum</i> Wall.	Endemic W.G.	Tree	Inner bark is useful as astringent, febrifuge.
48.	<i>Impatiens minor</i> (DC.) Bennet	Endemic W.G.	Herb	Flowers useful as cooling agent in burns, plants useful in joint pains
49.	<i>Impatiens pulcherrima</i> Dalzell	Endemic W.G.	Herb	Flowers useful as cooling agent in burns, plants useful in joint pains
50.	<i>Indigofera prostrata</i> Willd.	Endemic W.G.	Herb	-
51.	<i>Ixora brachiata</i> Roxb.	Endemic W.G.	Tree	-
52.	<i>Jasminum malabaricum</i> Wight	Endemic to W.G.	Shrub	Flowers are used in skin diseases
53.	<i>Mallotus aureopunctatus</i> (Dalzell) Mull.-Arg.		Tree	Fruits are used to extract dyes
54.	<i>Maytenus rothiana</i> (Walp.) Lobreau-Callen	Endemic W.G.	Tree	-
55.	<i>Moullava spicata</i> (Dalzell) D. H. Nicolson	Endemic W.G.	Shrub	-
56.	<i>Neuracanthus sphaerostachyus</i> (Nees) Dalzell	Endemic to W.G.	Shrub	Root powder is used as cure for ringworms.
57.	<i>Pleocaulis ritchiei</i> (C. B. Clarke) Bremek.	Endemic to W.G.	Shrub	-
58.	<i>Pogostemon deccanensis</i> (Panigrahi) Press	Endemic to W.G.	Herb	Fresh leaves used to clean wounds.
59.	<i>Porpax reticulata</i> Lindl.	Endemic to W.G.	Orchids	-
60.	<i>Senecio belgaumensis</i> (Wight) C. B. Clarke	Endemic to W.G.	Herb	-
61.	<i>Senecio bombayensis</i> N. P. Balakr.	Endemic to W.G.	Herb	-
62.	<i>Smithia bigemina</i> Dalzell	Endemic W.G.	Herb	-
63.	<i>Strobilanthes ixiocephala</i> Benth.	Endemic to W.G.	Shrub	Honey is extracted from

				flowers
64.	<i>Strobilanthes lupulina</i> Nees	Endemic to W.G.	Shrub	Honey is extracted from flowers
65.	<i>Syzygium laetum</i> (Buch.-Ham.) Gandhi	Endemic W.G.	Tree	Honey is extracted from flowers
66.	<i>Terminalia paniculata</i> Roth	Endemic W.G.	Tree	Juice of fresh flowers used as a remedy for cholera & opium poisoning with roots of <i>Cocculus villosus</i> . Bark used as cardiotonic.
67.	<i>Tolypanthus lagenifer</i> (Wight) Tiegh.	Endemic to W.G.	Parasites	-
68.	<i>Utricularia albocaerulea</i> Dalzell	Endemic to W.G.	Herb	-
69.	<i>Wendlandia thyrsoides</i> (Schult.) Steud.	Endemic W.G. of MS	Tree	-
70.	<i>Zingiber neesianum</i> (J. Graham) Ramamoorthy	Endemic to W.G.	Herb	Tubers are used as antiseptic

2. FAUNAL DIVERSITY IN THE STUDY AREA:

The diversity of faunal elements exclusively from rocky plateaus has not yet been carried out. However, diverse vertebrate and invertebrate taxa have been reported from microhabitats and adjoining vegetation of Sacred Grove areas of plateaus. Under stressful conditions of summer or during heavy monsoon season, faunal species have the ability to move away from outcrops. Faunal elements like butterflies, spiders, beetles, ground dwelling ants, scorpions, grasshoppers, odonata, ground nesting birds, reptiles as well as small and large mammals are often found on rocky plateaus. Lesser Kestrel a migrant species of raptors have been commonly observed on and around the rocky plateaus. The smaller invertebrate fauna commonly use boulders on plateaus for shelter during extreme conditions, while the same are used by lizards like *Sitana ponteceriana*. Malabar Crested Larks have also been seen very commonly on the plateaus, foraging, displaying on boulders and for nesting.

Birds are ecologically versatile and live in all kinds of habitats as herbivores or carnivores, and they are considered as useful biological indicators. The grassland and avifauna associated with adjoining forests of coastal lateritic plateaus is susceptible to the changes in habitats; similarly they are more conspicuous in an ecosystem and hence can be easily observed for monitoring the change taking place. Some birds are migratory, which are responsible for fluctuations in the population of birds that occur during different seasons of the year, which may help to know whether area is normal or getting polluted, as total absence of birds from any area may be considered as pollution indication. During the present investigation a total of 47 species of birds belonging 41 genera from 28 families have been reported from lateritic plateau areas and surrounding estuarine areas of coastal Ratnagiri district. Lawate and Mule (2009), have been reported 202 species of birds belonging to 47 families scattered over 141 genera from Chandoli National Park (CNP), Sangali district which also consists of lateritic plateaus in protected areas.

Cattle egrets were seen throughout the study period and were most abundant in number. Their dominance over other species of birds is due to their nesting period and location of their nesting sites in the mangroves of Bhatye estuary. Birds like Indian pond Heron, Kingfishers, Pariah Kites and Eagles were seen in the migrating from estuary to adjoining forests and wetlands on plateaus in search of food as well as for resting purpose. Their appearance towards the riverine side of the estuary and sea was more recorded than on plateaus and forest areas. Some species such as

kingfishers, red wattled lapwing, were observed to be present throughout the year migrating from estuarine region to forest and grassland regions of lateritic plateaus.

The maximum number of birds was sighted in the thick forest regions on the slopes of plateaus, where shifting cultivation for cashew nuts and mango plantation carried out along the plateaus. White-bellied sea eagle- *Haliaeetus leucogaster* and Malabar Pied Hornbill- *Anthracoceros coronatus* are the vulnerable species (The Red Data Book on Indian Animals, Part 1: Vertebrata, of Zoological Survey of India, 1994) included in Schedule I (Section III Birds) of the Wildlife Protection Act amended up to 2006, found along Bhatye estuary and its coastal region. They take shelter in adjoining forest areas for nesting purpose. Whereas, Malabar Pied Hornbill included in Near Threatened categories by IUCN Red List of Threatened Species (2002) (Chandra and Mahabal 2009; Chandra and Gupta 2009). As per our knowledge species like Rufous Treepie and Asian Paradise Flycatchers are reported first time on these plateaus.

In the present study, the maximum number of species and individuals were observed in scrub jungle, slopes of lateritic plateaus, as well as on open grasslands of lateritic plateau where availability of diverse plants and access to host plants viz., *Bombax ceiba*, *Heterophragma quadriloculare*, *Sterculia urens*, *Atlantia racemosa*, *Buchnanian lanzan*, *Mangifera indica*, *Cassia fistula*, *Carissa carandus*, *Memecylon umbellatum*, *Syzygium cuminii*, *Catunaregam spinosa*, *Crotalaria verucosa*, etc. promoted the birds richness and density. Most of these plants provide rich food source to adult birds.

Frogs spawn in ephemeral pools. Lizards, geckos, skinks (*Hemidactylus* sp., *Sitana ponticeriana*, *Cnemaspis* sp.) and Caecilians have been frequently observed on plateaus during monsoon season. However, most of the plateau fauna is not easily visible and often takes shelter under boulders especially during the day, either to avoid the harsh sun or because of vulnerability to predators like raptors (eagles are frequently noted) in the open areas.

Insect fauna associated with these plants are also acts like good preys for predatory bird species. Comparatively the other habitats especially, monoculture and sandy area have lesser density of vegetation. These habitats being highly disturbed due to anthropogenic activities could also account for lower bird species. Some species like common crow, pigeons, doves, sparrows and bulbuls and Jungle mynas have shown more adaptation to human settlement and disturbed areas. They were observed feeding on kitchen wastes thrown in some areas along the plateau. Coastal

lateritic plateaus in Ratnagiri district harbours rich bird diversity, which is unfortunately not explored by scientific community to the proper extent. Human interference with these ecosystems for civilization and industrialization is affecting not only diversity but abundance of many birds and other animal species.

TABLE-7 : Bird Diversity From Coastal Lateritic Plateau of Ratnagiri District and adjoining Forest Areas

No.	Name	Scientific Name	Monsoon	Winter	Summer	Status
FAMILY: ARDEIDAE						
1	Cattle Egret	<i>Bubulcus ibis</i>	++	++	++	R.LM/ C
FAMILY: ACCIPITRIDAE						
2	Brahminy Kite	<i>Haliastur Indus</i>	0	++	++	R/C
3	Pariha Kite (Black Kite)	<i>Milvus migrans</i>	+	+++	+++	R/C
4	Oriental honey buzzard	<i>Pernis ptilorynchus</i>	-	+	+	WM/ r
5	White bellied sea eagle	<i>Haliaeetus leucogastor</i>	-	+	+	M/r
6	Shikra	<i>Accipiter badius</i>	+	+	+	LM/UC
FAMILY: PHASIANIDAE						
7	Rain Quail	<i>Coturnix coromandelica</i>	+	+	0	No
FAMILY: CHARADRIIDAE						
8	Red wattled Lapwing	<i>Vanellus indicus</i>	++	+++	++	R/C
FAMILY: COLUMBIDAE						
9	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	+	0	+	No
10	Rock Pigeon	<i>Columba livia</i>	++	+++	++	R/C
11	Little Brown Dove	<i>S. senegalensis</i>	+++	0	++	R/C
12	Spotted Dove	<i>S. chinensis</i>	++	0	+	
FAMILY CUCULIDAE						

13	Greater Coucal	<i>Centropus sinensis</i>	+	++	++	R/C
14	Jacobian Cuckoo	<i>Clamator jacobinus</i>	+	0	+	No
15	Asian Koel	<i>Eudynamys Scolopacea</i>	-	+	++	R/C
FAMILY: STRIGIDAE						
16	Common Barn Owl	<i>Tyto alba</i>	-	+	+	R/r
FAMILY: PSITTACIDAE						
17	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	0	+	0	R/UC
18	Rose-ringed Parakeet	<i>Psittacula krameri</i>	+	++	++	R/C LM
FAMILY: ARDEIDAE						
19	Indian Pond heron	<i>Ardeola grayii</i>	++	++	++	R.LM/ UC
FAMILY: APODIDAE						
20	Asian Palm swift	<i>Cypsiurus balasiensis</i>	+	++	++	R.LM/ C
FAMILY: ALCEDINIDAE						
21	Lesser Pied Kingfisher	<i>Ceryle rudis</i>	+	0	++	R/UC
22	Oriental Dwarf Kingfisher	<i>Ceryx eritheca</i>	++	+	+	R
23	White throated Kingfisher	<i>Halcyon smyrnensis</i>	++	++	++	R/C
FAMILY: UPUPIDAE						
24	Common Hoopoe	<i>Upupa epops</i>	-	+	+	UC/r
FAMILY: BUCEROTIDAE						

25	Malbar Pied hornbill	<i>Anthracoceros coronatus</i>	-	+	+	R/UC/ r
FAMILY: ALAUDIDAE						
26	Ashy-crowned Finch Lark	<i>Eremopterix griseus</i>	+	+	+	R/UC
27	Rufous-tailed Lark	<i>Ammomanes phoenicura</i>	-	++	++	LM/C
FAMILY: DICRURIDAE						
28	Ashy Drongo	<i>Dicrurus leucophaeus</i>	-	++	+	R/UC
29	Black Drongo	<i>Dicrurus macrocerus</i>	+	++	++	R/C
FAMILY: STURNIDAE						
30	Jungle Myna	<i>Acridotheres fuscus</i>	++	++	++	R/C
FAMILY: CORVIDAE						
31	Rufous Treepie	<i>Dendrocitta vagabunda</i>	-	+	+	WM/ r
32	House Crow	<i>Corvus splendens</i>	++	++	+++	R/C
FAMILY: CAMPEPHAGIDAE						
33	Small Minivet	<i>Pericrocotus cinnamomeus</i>	++	++	+	R/UC
FAMILY: IRIENIDAE						
34	Common Iora	<i>Aegithina tiphia</i>	0	0	+	No
FAMILY: PYCNONOTIDAE						
35	Red Whiskered Bulbul	<i>Pycnonotus jocosus</i>	++	++	++	R/C
FAMILY: TIMALINAE						
36	Jungle Babbler	<i>Turdoides striata</i>	+++	++	++	R/C

FAMILY: MUSCICAPINAE						
37	Asian Paradise Flycatcher	<i>Terpsiphone paradise</i>	-	+	+	R/r
FAMILY: ORIOLIDAE						
38	Black hooded Oriole	<i>Oriolus xanthornus</i>	-	+	++	WM/UC
FAMILY: TURDINAE						
39	Indian Robin	<i>Saxicoloides fulicatus</i>	++	++	++	R/C
40	Oriental Magpie-Robin	<i>Copsychus saularis</i>	++	++	++	R/C
FAMILY: PARIDAE						
41	Yellow Tit	<i>Parus holsti</i>	-	+	+	UC/r
FAMILY: MOTACILLIDAE						
42	Long-billed Pipit	<i>Anthus similis</i>	0	+	0	No
43	White Wagtail	<i>Motacilla alba</i>	+	+	+	R/UC
44	Grey Wagtail	<i>Motacilla cinerea</i>	0	0	+	R/C
45	White-browed Wagtail	<i>Motacilla maderaspatensis</i>	+	+	+	R/UC
FAMILY: NECTARINIDAE						
46	Purple Sunbird	<i>Cinnyris asiaticus</i>	++	+	+	R/C
47	Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	0	++	+	No
FAMILY: PLOCEIDAE						
48	House Sparrow	<i>Passer domesticus</i>	+++	+	+++	R/C

R= Resident; **M**=Migrant; **LM**=Local Migrant; **WM**= Winter Migrant; **UC**=Uncommon; **C** = Common; **r** =Rare. — = Not Sighted; + = Rarely Sighted; ++ = Abundant.

DIVERSITY OF INSECTS:

As far as diversity of insects are concerned species of insects are distributed unevenly among the higher taxonomic groups. Five orders stand out for their high species richness, which includes Coleoptera (beetles), Diptera (flies), Hymenoptera (wasps, ants and bees), Lepidoptera (butterflies and moths), and the true bugs i.e. Hemiptera. Among them beetles comprise almost 40% of described insects (more than 3,00,000 species). Although other orders are described as minor this doesn't mean that it is insignificant.

As insect, being the member of biotic community, interact with other living members of the community as well as with nonliving components of the environment. The outcome of these interactions is the population dynamics, the positive or negative growth of the population. Hence the life system, existence, abundance and diversity of insects can be understood by the study of interaction between the insects and the biotic and abiotic factors as well as population dynamics.

As grassland comprise more than a quarter of the Earth's land surface. In addition to supporting a wide range of vertebrates such as domestic livestock and variety of species, grassland is natural habitat for a wide range of invertebrates. Tropical grassland plateaus are extremely important from the scientific point of view as they are populated by quite wide variety of species, with interesting unique, physiological and behavioral properties. The species form a part of functional communities, they make the good subject for the study of ecology, especially the habitats are small and the data is applicable to larger situations and ecological theory in general.

MATERIAL AND METHODS

One of the best ways to study about insects is to go out and collect them. Insects can be found everywhere and usually in considerable numbers. The best time to collect is in summer, but insects are active throughout year in tropical countries and many can be found hibernating during the winter. Since different species are active at different times of the day, at least some kind of insects can be collected at any hour. Bad weather conditions like rain or low temperature will reduce the activity of many insects. For the purpose of present study, summer and monsoon period is selected, as it is the most productive period for the life on grassland ecosystem. It is the most flourishing season for a producer that is plants and grasses. It also gives rise to verity of insects on plateau.

In the present investigation, instead of collecting insects, direct observation method has been used. During field visits the photographs have been taken and those related with insect and plant interactions have been given in photographic plates.

IDENTIFICATION:

The insects were then identified with the help of available standard literature such as Borrer, *et al* (1992), Gullan & Cranstan (2000), Mauro, *et al* (1987), Gunathilagaraj, *et al* (1998), Haribal (1992), Mani (1995), Pradhan (1992), Saxena (1992). During the tenure of the project, a total of 123 species of insects belonging to the 8 orders were recorded. These included 56 species of Lepidoptera, 24 species of order Coleoptera, 9 species of Hymenoptera, 8 species of orders Orthoptera and Hemiptera, 7 species of Odonata and 5 each of Phasmidea and Mentodea.

It was observed that in some places on the lateritic plateaus like near trees and water bodies, abundance of insects was recorded. Barren areas showed presence of fewer numbers. As the plateau is relatively undisturbed and less polluted, the grassland on the plateau shows diversity of insects. During the collection period, due to heavy rainfall and changing weather conditions, fluctuation in the populations of insects was observed.

List of Orders and their species recorded is as follows:

Order Odonata: Dragonflies and Damselflies

The Odonata are relatively large and often beautifully coloured insects that spent large part of their time on the wing. The immature stages are aquatic and the adults are usually found near water. All stages are predacious and feed on various insects and other organisms. The forewings are elongate, many veined and membranous. The compound eyes are large and many-faceted. The thorax is relatively small and compact. They are about 20 – 135mm in length and have a maximum wingspread of about 71cm. This order contains 4870 species belonging to 11 families.

The separation of the families of Odonata is based primarily on characters of the wings. There are 3 major interpretations of wing variation in this order. Riek and Kukalova-Peck (1984) proposed classification methods have been used. The separation of genera and species is based on wing venation, colour pattern, structure of the genitalia and other characters. Many species of Odonata can be recognized in the field by their characteristic size, shape, colour or habits.

TABLE- 8: Names of the Odonata species recorded from sacred groves

Family	Scientific name	Common name
Libellulidae	<i>Palpopleura sexmaculata</i>	Blue tailed Ashy skimmers
	<i>Paragomphus lineatus</i>	Common hooktail
	<i>Trithemis aurora</i>	Crimsom marsh glider
	<i>Diplacodestrivialis</i>	Common ground skimmer
	<i>Orthetrum sabina</i>	Green marsh hawk
	<i>Neurothemis tullia</i>	Pied paddy skimmer
	<i>Crocothemis servilia</i>	Ruddy marsh skimmer
	<i>Libellago lineata</i>	River Heliodor
	<i>Copera vittata</i>	Blue bush dart
	<i>Copera sp.</i>	Bush dart
	<i>Caconeura ramburi</i>	Coorg Bambootail
Aeshnoidae	<i>Anaxa guttatus</i>	Blue tailed green Darners
Coenagrionidae	<i>Ceriagrion coromandelianum</i>	Narrow winged damsel flies
	<i>Ischnura delicate</i>	

Order Phasmida: Walkingsticks, Leaf Insects

The members of this order do not have the hind femora enlarged. Thus, they do not jump. The species in our area have the body elongated and stick-like; wings are either much reduced or entirely absent. Some tropical forms greatly resemble leaves and are good examples of camouflage. They are slow moving and herbivorous and are usually recorded on trees or shrubs. They are similar to twigs in appearance and are able to emit a foul smelling substance from glands in the thorax, a behaviour that serves as a means of defense. Unlike most insects, the walking sticks are able to regenerate lost legs. These insects are not sufficiently numerous to do much damage to cultivated plants and trees. There are about 2000 species worldwide.

TABLE 9: Names of the Phasmida species recorded from Taleigaon Plateau

Family	Scientific name	Common name
Timemidae (2species)	<i>Timema sps.</i>	Timea walkingsticks
Pseudophasmatidae	<i>Anisomorpha sps.</i>	Striped walkingsticks
Heteronemiidae	<i>Diapheromera femorata</i>	Common walkingsticks

Order Orthoptera: Grasshoppers, Crickets

This order contains very common and well-known insects, most of which are plant feeders. Some of these are important pests of cultivated plants. A few are predacious, few are scavengers and others are more or less omnivorous.

The Orthoptera may be winged or wingless, and the winged forms usually have four wings. The front wings are usually elongate, many veined and somewhat thickened. The hind wings are membranous broad, and many veined, and at rest they are usually folded fan wise beneath the front wings. Some species have one or both pairs of wings greatly reduced or absent. The body is elongated and cerci are well developed and many segmented and the antennae are relatively long and many segmented. Many species have a long ovipositor, which is sometimes as long as body. In others the ovipositor is short and more or less hidden. The tarsi are usually three to four segmented. The mouthparts are of the chewing type (mandibulate), and the metamorphosis is simple.

A great many types of insects sing. The songs of these insects are produced by stridulation, which is by rubbing of one body part against another. The singing orthopteran usually posses auditory organs-oval eardrums or tympana, located on the sides of first abdominal segment (short-horned grass hoppers) or at the base of the front tibiae (long-horned grasshoppers and crickets). The songs of grasshoppers and crickets play an important role in their behavior and differ in different species. Until rather recently, this order included the grasshoppers, crickets, and katydids, but also the mantids, stick insects cockroaches etc. The significant differences are in rhythm. A total of 12,500 species have been so far recorded.

TABLE 10: Names of the Orthoptera species recorded from different Plateaus

Family	Scientific name	Common name
Gryllotalpidae	<i>Neocurtilla sps</i>	Mole cricket
Nimobiinae	<i>Acheta sps</i>	Ground crickets
Acrididae	<i>Poicelocera picta</i>	Printed grasshopper
	<i>Tryxalis turrita</i>	Shorthorned grasshopper
	<i>Melanoplus sps</i>	Spurthroated grasshopper
Tetrigidae	<i>Tettigidea sps</i>	Pygmy grasshopper

Order Mantodea: Mantids

Mantids are large, elongate, rather slow moving insects that are striking in appearance because of their peculiarly modified front legs. The prothorax is greatly lengthened and movably attached to the pterothorax; the front coxae are very long and mobile; and the front femora and tibiae are armed with strong spines and fitted for grasping prey. The head is freely movable. Mantids are the only insects that can “look over their shoulder.” They are highly predacious and feed on variety of insects including other mantids. They usually lie in wait for their prey with the front legs in an upraised position. This position has given rise to the common name “praying mantid”.

Mantids overwinter in the egg stage, and the eggs are deposited on twigs or grass stems in a styrofoam like egg like egg case or ootheca secreted by the female. Mantids well known as biological control agents, and one can buy them to place in garden to help control pest insects. This practice is not recommended because the mantids cannot possibly keep up with populations of damaging insects. There are more than 1500 species in 8 families of mantids in the world, most of which are tropical.

TABLE 11: Names of the Mantodea species recorded from study area

Family	Scientific name	Common name
Mantidae	<i>Stagmomantis carolina</i>	Mantids
	<i>Stagmomantis sps.</i>	
	<i>Tenodera sps.</i>	

Order Hemiptera: Bugs

The Hemiptera are sometimes called the “true” bugs, to distinguish them from other insects. The name of the order is due to the distinctive structure of the front wings. In most Hemiptera, the basal portion of the front wing is thickened and leathery while the apical portion is membranous. This type of wing is called as hemelytron. The hind wings are entirely membranous and are slightly shorter than the front wings. The wings at rest are held flat over abdomen, with the membranous tips of the front wings overlapping. The mouthparts are of the piercing-sucking type and are in the form of a slender, usually segmented beak that arises from the front part of the head and generally extends back along the ventral side of the body.

The antennae are fairly long in most of the terrestrial species and consist of four or five segments. The compound eyes are well developed but the ocelli may be present or absent. Most adult Hemiptera have scent glands that open on the sides of the thorax. These glands give off characteristic odor when the insect is disturbed. This odor is often unpleasant to people. Most of the Hemiptera have well-developed wings, but some species are wingless. Hemiptera usually lay their eggs in or on plants or in crevices, or in some cases eggs are simply dropped. The members of this order undergo simple metamorphosis, and most of them have five nymphal instars.

The Hemiptera are a large and widely distributed group of insects. Most species are terrestrial, but many are aquatic. Many feed on plant juices and some are serious pests of cultivated plants. Others are predaceous and some of these are very beneficial to man. Still others attack humans and other animals and suck blood, and few of these act as disease vectors. There are around 50,000 species of Hemiptera in the world. The principal characters used in separating the families of the Hemiptera are those of the antennae, beak, legs, and wings. Features of the thorax and abdomen

(particularly the symmetry or asymmetry of the genitalia, the nature of the phallus and spermatheca, and the positions of the spiracles), and such general characters as size, shape color and habitats are sometimes used in separating families.

TABLE 12: Names of the Hemiptera species recorded from study area

Family	Scientific name	Common name
Coreidae	<i>Anasa sps</i>	Leaf footed bug
	<i>Alydus sps</i>	
Lygaeidae	<i>Aphanus sps</i>	Seed bugs
	<i>Blissus sps</i>	
Acanthosomatidae	<i>Euchistus sps</i>	Stink bugs
	<i>Euchistus sps</i>	
	<i>Thynta sps</i>	
Pentatomidae	<i>Coenus sps</i>	Stink bugs
	<i>Coenus oebalus</i>	

Order Coleoptera: Beetles

Order Coleoptera is the largest order of insects and contains about 40% of the known species. These vary in length from less than a millimeter up to about 75mm. Some tropical species reach a length of about 125mm. The beetles vary considerably in habits and are to be found almost everywhere. Many species are of great economic importance. One of the most distinctive features of Coleoptera is the structure of the wings. Most beetles have four wings, with the front pair thickened, leathery or hard. The hind wings are membranous, are usually longer than the fore wings, and when at rest, are usually folded up under the front wings. The mouth is of the chewing type and the mandibles are well developed. The mandibles of many beetles are stout and are used in crushing seeds or gnawing wood.

The beetles undergo complete metamorphosis. The larvae vary considerably in form in different families. They feed on all sorts of plant and animal materials. Many are phytophagous, many are predacious, some are scavengers, others feed on mould or fungi and very few are parasitic. Some are subterranean in habit, many are aquatic and semiaquatic and few live as comensals in the nests of social insects. Some of the phytophagous species are free feeders on foliage. The life cycle in this order varies in length from four generations a year to one generation in several years. Most species have one generation a year. Many overwinter as partly grown larvae; many overwinter as

pupae in chambers in the soil or in the wood or in other protected situations. Some coleoptera produce sound, it is reported in about 50 families, but the sound produced are rather generally weak. The life cycle in this order varies in length from 4 generations a year to 1 generation in several years. There are about 3 lakh species from 115 families recorded. The principle characters of beetles used in identification were those of the head, antennae, thoracic sclerites, legs, elytra, and abdomen. Occasionally, characters such as size, shape, and colour were used. In most cases these characters are depends on the size of the beetle.

TABLE 13: Names of the Coleoptera species recorded from study area

Family	Scientific name	Common name
Scarabaeidae		Scarab beetle
Subfam:Scarabaeinae	<i>Geotrupes sps</i>	Dung beetles
	<i>Phanaeus sps</i>	
Subfam:Centoniinae	<i>Osmoderma sps</i>	Flower beetles
Subfam:Dynastinae	<i>Dynastes sps</i>	Rhinoceros beetles
Cicindelidae	<i>Cicindela sps</i>	Tiger beetles
Carabidae	<i>Anthiasex guttata</i>	Ground beetles
Buperstidae	<i>Chalcophora sps</i>	Metallic wood boring beetles
	<i>Dicera tenebrosa</i>	Metallic beetles
Lampyridae	<i>Photuris sps</i>	Fire flies
Coccinelidae	<i>Hippodamia sps</i>	Ladybird beetles
Tenebrionidae	<i>Diaperis sps</i>	Darkling beetles
Meloidae	<i>Platnotus belli</i>	Blister beetles
Cerambycidae	<i>Anoplodera sps</i>	Long horned beetles
Subfam:Spondyliinae	<i>Asemum sps</i>	

Subfam: Lamiinae	<i>Goes tigrinus</i>	
	<i>Goes</i> spp.	
Chrysomelidae	<i>Crioceris</i> spp.	Leaf beetles
Subfam:Cassidinae	<i>Cassida</i> spp.	Tortoise beetles
	<i>Chelymorpha</i> spp.	

Order Lepidoptera: Butterflies and Moths

The butterflies and moths are common insects and well known to everyone. They are most readily recognized by the scales on the wings. Most of the body and legs are also covered with scales. Its members are to be found almost everywhere, often in considerable numbers. The Lepidoptera have considerable economic importance. The larvae of most species are phytophagous and many are serious pests of cultivated plants. On the other hand, adults of many species are beautiful and serve as the basis of art and design. Natural silk is the product of a member of this order.

The mouthparts are usually fitted for sucking. A few species have vestigial mouthparts and do not feed in the adult stage. The mandibles are nearly always lacking. The proboscis, when present, is formed by the appressed, long and coiled. The maxillary palps are generally small or lacking. Compound eyes are relatively large and composed of a large numbers of facets. Most moths have two ocelli, one on each side closed to the margins of compound eyes. Several families have auditory organs called tympana, which are belived to function high frequency ecolocating sounds of bats. The members of this order undergo complete metamorphosis, and their larvae usually called caterpillars. Many lepidopteran larvae have grotesque or ferocious appearances that make people afraid of them, but vast majority are quite harmless when handled. The ferocious appearance probably plays a role in defense by deterring potential predators.

Most butterflies and moth larva feed on plants, but different specie feed in different ways. The larger larva generally feed at the edge of the leaf and consumes all but the larger veins. The smaller larva usually makes hole in the center of leaf and then feed. The larva of Lepidoptera has well developed silk glands and usually pupates and forms a cocoon. Most of the Lepidopteran species have eyespots and larval images on their wings, which are used for self-defense. There are

about 1, 12,000 species worldwide. The principal characters used in identifying adult Lepidoptera are those of the wings (venation, method of wing union, wing shape and scaling). Other characters used include the characters of the antennae, mouthparts, ocelli, and legs, and frequently such general features as size and color.

TABLE 14: Lepidoptera species recorded from Sacred Groves on Coastal Lateritic Plateaus of Ratnagiri district

Family	Scientific name	Common name
Nymphalidae	<i>Danaus chrysippus chrysippus</i>	Plain tiger
	<i>Danaus genutia genutia</i>	Striped tiger
	<i>Tirumala limniace exoticus</i>	Blue tiger
	<i>Tirumala septentrionis</i>	Dark blue tiger
	<i>Euploea core</i>	Common Indian Crow
Nymphalidae	<i>Précis iphita iphita</i>	Chocolate pansy
	<i>Précis almana almana</i>	Peacock pansy
	<i>Précis lemonias lemonias</i>	Lemon pansy
	<i>Moduza procris undifragus</i>	Commander
	<i>Ariadne merione merione</i>	Common castor
	<i>Hypolimnas misippus</i>	Danaid eggfly
	<i>Précis atlites</i>	Grey pansy
	<i>Neptis hylas varmona</i>	Common sailer
	<i>Cirrochroa thais thais</i>	Tamil yeoman
	<i>Acraea violae</i>	Tawny coster
	<i>Charaxes solon solon</i>	Black rajah
	<i>Cyrestis thyodamas indica</i>	Map butterfly
Pieridae	<i>Eurema blanda sihetana</i>	Three spot grass yellow

	<i>Eurema hecabe simulata</i>	Common grass yellow
	<i>Delias eucharis</i>	Common jezebel
	<i>Pareroniavaleria hippia</i>	Common wanderer
	<i>Leptosia nina nina</i>	Psyche
	<i>Gandaca harina assamica</i>	Tree yellow
Lycanidae	<i>Discolampa ethion vavasanus</i>	Banded blue pierrot
	<i>Azanus ubaldus Cramer</i>	Bright babul blue
	<i>Castalius rosimon rosimon</i>	Common pierrot
	<i>Talicauda nyseus nyseus</i>	Red pierrot
	<i>Loxura atymnus</i>	Yamfly
	<i>Curetis dentata</i>	Angled sunbeam
Papilionidae	<i>Papilio polytes romulus</i>	Common mormon
	<i>Papilio polytes stichius</i>	Common mormon
	<i>Pachliopta aristolochiae</i>	Common rose
	<i>Pachliopta hector</i>	Crimson rose
	<i>Graphium agamemnon menid</i>	Tailed jay
	<i>Papilio machaon</i>	Yellow swallowtail
	<i>Parnassius hardwicii</i>	Commonblue apollo
	<i>Triodes minos</i>	Southern bird wing
Satyridae	<i>Mycalesis ssubdita</i>	Bush brown
	<i>Melanitis leda leda</i>	Common evening brown
Sphingidae	<i>Acherontia atropos</i>	Head hawkmoth
	<i>Hyles lineataa</i>	Striped hawkmoth
	<i>Hyles gallii</i>	Bedstraw hawkmoth

Saturnidae	<i>Attacus atlas</i>	Atlas moth
	<i>Actias luna</i>	Lunamoth
Arctiidae	<i>Amata phegea</i>	
	<i>Euplagia quadripundari</i>	Jercy tiger
	<i>Phragmatobia fuliginosa</i>	Ruby tiger
	<i>Tyria jacobaeae</i> L	Cinnabar moth
Brahmaeidae	<i>Brahmaea wallichii</i>	Gray moth
Cossidae	<i>Zeuzera sps</i>	Leopard moth
Tortricidae	<i>Tortrix viridana</i>	
Pterophoridae	<i>Oxytilus sps</i>	
Nepticulidae	<i>Nepticula sps</i>	

Order: Hymenoptera - Ants, Wasps and Bees

This is the most beneficial order from the human point of view. It contains great many species that are of value as parasites or predators of insect pests and it contains the most important pollinators of plants, the bees. The Hymenoptera are very interesting group in terms of their biology. They exhibit a great diversity of habitats and complexity of behavior in the social organization of the wasps, bees and ants. The winged members of this order have 4 membranous wings; hind wings are smaller than forewings. The wing contains relatively few veins, and in some minute forms there are no veins at all. The mouthparts are mandibulate, but in many, especially the bees, the labium and maxillae form a tongue-like structure through which liquid food is taken. Antennae usually contain 10 or more segments and are generally long. The ovipositor is well developed. In some insects it is modified into a sting, which functions as organ of offense and defense. Only female can sting.

The metamorphosis is complete and in most of the order, larvae are grub-like or maggot-like. Sex in most hymenoptera is controlled by fertilization of the egg. Fertilized eggs developed into female and unfertilized egg usually developed into males. Venation characters are used a great deal

to separate the various groups of Hymenoptera. Leg characters, antennal characters, thoracic, abdominal and other characters are also used in identification of Hymenoptera.

TABLE 15: Names of the Hymenoptera species recorded from study area

Family	Scientific name	Common name
Superfamily Ichneumonoidea		
Braconidae	<i>Meteorus</i> <i>sps.</i>	Braconids
	<i>Phanomeris</i> <i>sps.</i>	
Ichneumonidae	Unidentified	Ichneumonids
Superfamily Chalcidoidea	<i>Eupteronalus</i> <i>sps.</i>	Chalcids
Apidae		Honey bees
Subfamily Bombinae	<i>Xylocopa</i> <i>sps.</i>	Bumble bees
Subfamily Apinae	<i>Apis cerena indica</i>	Indian honeybee
	<i>Apis dorsata</i>	Rock bee
	<i>Apis florea</i>	Dwarf bee

ANIMAL-PLANT INTERRELATIONSHIP:

Animals play important role in forest ecosystem through their activities in pollination, seed dispersal, predation of seeds and seedlings. Western Ghats including Sri Lanka considered as hottest hotspots of the world due to diversity in plants and animals (Myers *et al.* 2000). About 27 % of the country's flowering plant species are known from the Western Ghats of which 56% are of tree species. Among animal species about 350 invertebrate (20% endemic), 330 ants (11% endemic), 174 butterflies (40% endemic) and odonates (dragonflies and damselflies), 269 mollusks (76% endemic), over 500 species of birds and 120 species of mammals are also known from this region.

The large number of animal-plant interactions in this unique and diverse corridor is neglected and less studied. The discovery and understanding their role in undisturbed forest has been a major challenge for biologist. The human pressure through forest clearing and fragmentation for various agricultural activities like shifting cultivation, mango and cashew-nut plantation has changed the population size, distribution, assemblage composition and behavior of animals. Fragmentation of habitat by clearing, for uses such as agriculture or urban development, may have mixed results on plant-pollinator interactions (Renner 1996). In present investigation the interactions between animals and plants in the Sacred Groves of coastal lateritic plateaus and adjoining areas is studied. Role of insects, birds, mammals in pollination services, dispersal and association is observed in indigenous and RET category plant species. Efforts are made in understanding role of this interaction in conservation and management of biodiversity in Ratnagiri district.

Important observations-

The documentation on floristic diversity and visual observations on plant-animal interrelationship has been done. In the study area it is observed that the intense cutting for mango and cashew plantation leads to the loss of indigenous flora. Due to this activity the alternative food source of many insect pastes are declining in alarming rate. This leads to many pathogenic attacks on mango and cashew plantation. The adverse effect of mining is also observed in declining the superficial soil and nutrient strata of lateritic plateaus. An overall food chain and food webs present in the sacred forest areas will be documented and assessed for adverse impact of anthropogenic factors in next stage of the study. Use of various plants for medicinal purpose by local communities residing around sacred grove has been observed. Therefore the ethno-medicinal plants will identified and documentation of such plants has been done. Further in the study area the study on inter-

relationship between plants and animals has been observed on many ephemeral and taxonomically important plant species.

Pollination in some arboreal elements found in sacred grove area

1. *Sterculia colorata* Roxb. (Sterculiaceae)- A medium sized tree commonly known as ‘Scarlet Sterculia’ occasionally found in coastal laterite plateaus of Ratnagiri district. During the study, important observations on plant-animal interrelationship have been carried out in pollination behavior of *Sterculia* flowers and birds. Before the onset of flowering the plants sheds off the leaves and produces orange-red flowers in bloom during March-April. Due to distinct colour and downwardly oriented flowers, many birds get attracted for nectary. It includes passerine birds (small birds) like Green Bulbul, Redvented Bulbul, Yellowcheeked Tit, Tickell’s Flower Pecker, Purple Rumped Sunbird, Purple Sunbird and White Eye. Amongst them the activity of Sunbirds and White Eye appears at the flowers during forenoon hours while Bulbul, Tits and Flower Peckers frequently visited flowers to pick insect larvae. It is observed that Sunbirds and White Eye visited flowers regularly act as true pollinators.

TABLE- 16: List of Birds species visiting flowers of *Sterculia colorata*

Bird Species	Common Name	Frequency	Source of Food
Family- Picnionitidae			
1. <i>Chloropsis aurifrons</i> Temminck	Green Bulbul	Occasional	Larve from buds & flowers
2. <i>Pycnonotus cafer</i> L.	Redvented Bulbul	Occasional	Larve from buds & flowers
Family- Paridae			
3. <i>Parus xanthogenys</i> Vigors	Yellowcheeked Tit	Occasional	Larve from buds & flowers
Family- Dicacidae			
4. <i>Dicaceun erythrorhynchos</i> Latham	Tickell’s Flower Peckers	Occasional	Nectar
Family- Nectariniidae			

5. <i>Nectarinia asatica</i> Latham	Purple Sunbird	Regular	Nectar
6. <i>Nectarinia zeylanica</i> L.	Purple Rumped Sunbird	Regular	Nectar
Family- Zosteropidae			
7. <i>Zosteropus palpebrosa</i> Temmnick	White Eye	Regular	Nectar

2. *Bomba ceiba* L. (Bombacaceae)- A tall deciduous tree commonly known as ‘Semal’ or ‘Shewari’ found in deciduous to moist deciduous forests of Ratnagiri district. During field study, observations on pollination biology of *Bomba ceiba* L. has been carried out during January to March. Plant produces large, numerous, cup-shaped, crimson coloured flowers when trees are leafless and flowers are with bunch of stamens and numerous nectary. Flowers are adapted for bird pollination and start openin afre midnight till morning. The activity of birds bigins from early morning to evening. During full blooming period, birds like *Sturnus*, Nectarine, *Acridatheres*, *Pycnonatus*, Black Drongo, Golden Oriole, Black Headed Orioles, Jungle Myna, Malabar Grey Hornbill, etc. Mammals like Hanuman Langoons, Bonnet Macaque, Squerrils, Bats, etc. are the frequent visitors.
3. *Heterophragma quadriloculare* (Bignoniaceae)- A medium sized (c 15 m.) tall tree, growing on the forest edges and in open forest. It produces large, white flowers with sweet odor during night and with abundant nectar. Based on preliminary observations it is observed that *Xylocopa*- Carpenter Bees are the only nocturnal flower visitor along with other insects like *Apes dorsata* and butterflies. During fruiting period Small Black Ants are also found to be feed on the sugary sap from the fuit coat.
4. *Erythrina variegata* L. (Fabaceae)- A deciduous, mdeium sized tree species found in coastal areas. It has orange-red colour, small flowers. Flowers are attractive to bird visitors in the leafless state during the flowering period. The birds included both passerines and nonpasserines. The passerines were *Dicrurus adsimilis* (Black Drongo), *Acridotheres tristis* (Indian myna), *A. fuscus* (Jungle myna), *Sturnus pogodarum* (Brahminy Myna), *Corvus macrorhynchos* (Jungle Crow), *C. splendens* (House Crow) and *Turdoides caudatus* (Common Babbler). The non-passerines were *Psittacula krameri* (Roseringed Parakeet) and *Dinopium benghalense* (Goldenbacked Woodpecker).

5. *Leea macrophylla* (Leeaceae)- *Leea* is undershrub and flowers are visited by a variety of potential insect pollinators, including flies, wasps, bees, butterflies and beetles.
6. *Terminalia chebula* (Combretaceae)- It is a medium to large sized, deciduous tree flowers during January to April. The major pollinators are *Apis dorsata*, *Apis cerana-indica*, *Polistes hebraeus*, *Vespa orientalis* and *Eristalinus* sp. diversity has been observed in pollinators visiting the flowers.
7. *Terminalia paniculata* Roth. (Combretaceae)- It is a medium to large sized, deciduous tree flowers during January to April and having woody fruits. The common pollinators recorded in the study area are *Apis dorsata*, *Apis cerana-indica*, *Polistes hebraeus*, *Vespa orientalis* and *Eristalinus* sp. visiting the flowers.
8. *Pogostemon deccanensis* (Lamiaceae)- It is herbacious plant with purple-violet flowers in spike inflorescence. It is observed that flies, bees, moths and butterflies are the frequent flower visitors for nectar and pollens.

PLATE- 6.A & B

Some Noteworthy Observations and Records from Study Area



Record of 5 *Atacus atlas* (Atlas Moth) from study area



PLATE- 7



Acacia catechu-a food plant of Hanuman Langoor



Rare occurrence of Mongoose



Rehabilitation of Leopard Cub



Swallow tail on *Dalbergia*



Stingless Bee on *Triemfetta*



Common Jezebel

PLATE- 8. A




PLATE- 8. B



PLATE-9. A

Some Noteworthy Observations on Feeding Behavior of Hanuman Langoor-

Animal	Plant Interaction
 <p data-bbox="550 454 954 481">Hanuman Langur- <i>Semnopithecus entellus</i> D.</p>	
<p>09 sp. of Hanuman Langoor (HL) are found in India (Grove, 2001). They mainly feed on leaves, fruits & tender leaves 126 sp. of plants recorded as food plants of HL. Of them 79 are tree sp.</p>	<p>Mostly feed on <i>Ficus</i>, <i>Cordia</i>, <i>Syzygium</i>, <i>Carvota</i>, <i>Terminalia</i>, etc. <i>Moraceae</i>, <i>Anacardiaceae</i>, <i>Mimosaceae</i>, <i>Fabaceae</i> are most preferable families.</p>

Some Food Plants of Hanuman Langur recorded from study area

 <p data-bbox="277 1473 491 1503"><i>Clausena anisata</i>- Fruits</p>	 <p data-bbox="539 1473 751 1503"><i>Diploclisia glaucescens</i></p>	 <p data-bbox="783 1473 943 1503"><i>Firmiana colorata</i></p>	 <p data-bbox="1023 1682 1294 1711"><i>Woodfordia fruticosa</i> -Flowers</p>
 <p data-bbox="261 1733 443 1762"><i>Terminalia bellerica</i></p>	 <p data-bbox="475 1787 619 1816"><i>Careya arborea</i></p>	 <p data-bbox="730 1718 906 1747"><i>Terminalia chebula</i></p>	 <p data-bbox="1070 1921 1193 1951"><i>Cassia fistula</i></p>
 <p data-bbox="699 1921 895 1951"><i>Catunaregum spinosa</i></p>			

PLATE 10

Observations on Insect-Plant Interrelationship in study area:



PLATE-10 B



PLATE-11



Association of *Crematogaster* Ants & *Terminalia arjuna*



Association of Black Ants with tender leaves of *Macaranga peltata*



A rare flowers of *Dillenia indica* & pollination by Stingless Bee

PLATE- 12



***Sterculia colorata* in full bloom and feast for many birds species (Table-6)**



Caterpillars of Noctuid Moth (*Asota plana*) commonly feeding on leaves of *Ficus hispida*

PLATE 13



Red Vented Bulbul



Grey Pied Hornbill



Association of *Cremastogaster* Ants & Fruits of *Memecylon umbellatum*



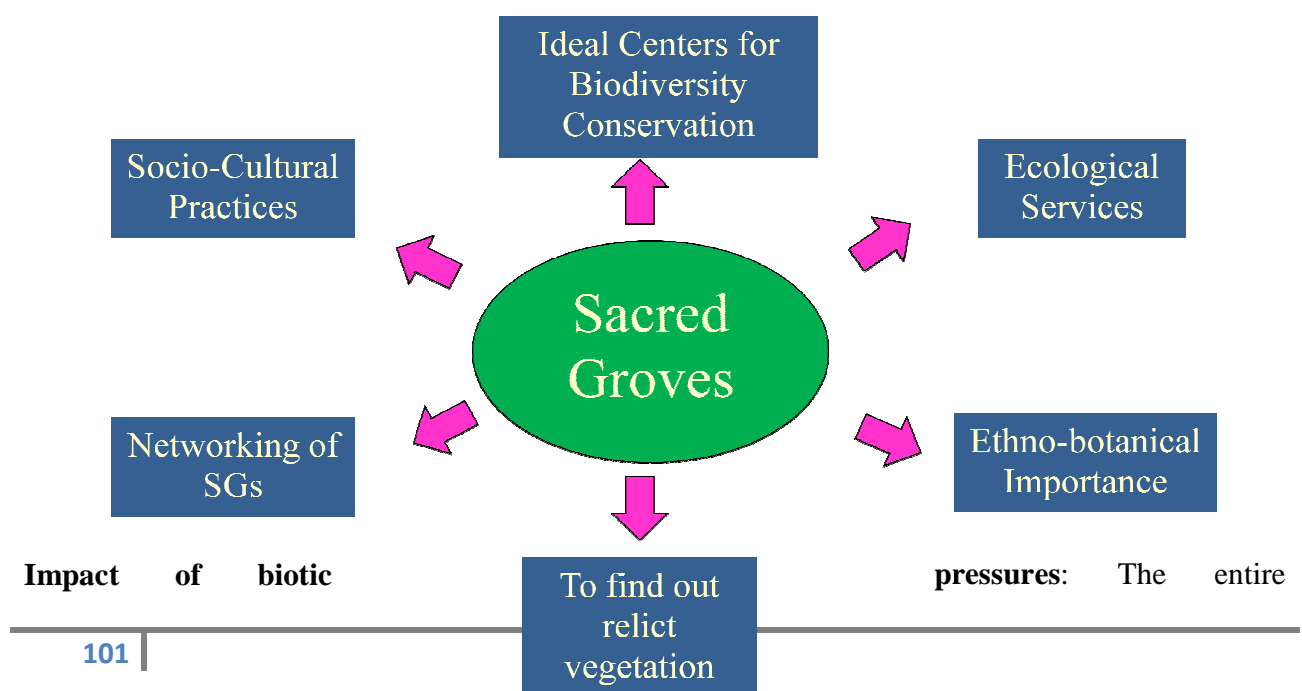
Red Vented Bulbul eating fruits of *Odina woodier*

RESULTS AND DISCUSSIONS-

During the floristic exploration of sacred groves of lateritic plateaus of Ratnagiri district about 306 plants species have been recorded few of them are as follows:

Actinodaphne angustifolia, *Aeginetia indica*, *Aerides crispa*, *Allophylus cobbe*, *Argyreia involucrata*, *Asparagus racemosus* var. *javanicus*, *Bridelia hamiltoniana*, *Bulbophyllum fimbriatum*, *Canthium angustifolium*, *Canthium dicoccum*, *Capparis moonii*, *Carallia brachiata*, *Carissa inermis*, *Casearia championii*, *Cassia fistula*, *Catunaregam spinosa*, *Clematis gouriana*, *Curcuma neilgherense*, *Curcuma pseodomontana*, *Dendrobium aqueum*, *Dendrobium barbatulum*, *Dendrobium ovatum*, *Diospyros candolleana*, *Diospyros montana*, *Ensete superbum*, *Eria dalzellii*, *Eria exilis*, *Eria reticosa*, *Ervatamia alternifolia*, *Eulophia nuda*, *Euphorbia antiquorum*, *Ficus tsjahela*, *Girardinia diversifolia*, *Glochidion ellipticum*, *Gloriosa superba*, *Glycosmis pentaphylla*, *Gymnema sylvestre*, *Heterophragma quadriloculare*, *Hoya wightii*, *Hymenodictyon obovatum*, *Impatiens balsamina*, *Ixora brachiata*, *Jasminum malabaricum*, *Leea indica*, *Leucas ciliata*, *Macaranga peltata*, *Maesa indica*, *Malaxis versicolor*, *Maytenus rothiana*, *Memecylon umbellatum*, *Mimusops elengi*, *Murraya koenigii*, *Nervelea prianiiana*, *Paracaryopsis malabarica*, *Peristylus aristatus*, *Persicaria auriculata*, *Porpax reticulata*, *Rauvolfia verticillata*, *Remusatia vivipara*, *Sapium insigne* var. *malabaricum*, *Scutia myrtina*, *Senecio bombayensis*, *Smilax zeylanica*, *Strychnos minor*, *Symplocos racemosa*, *Syzygium cumini*, *Terminali chebula*, *Zingiber neesanum*, etc..

Figure- 5: Different Aspects of the Current Inventory



Western Ghats and Konkan region is under heavy biotic pressures and rocky plateaus are no exception. Grazing, trampling, conversion to agriculture, quarrying have been going on for several years. Agriculture, tourism, mining for lateritic stones and more recent land use changes have taken a heavy toll on the rocky plateaus habitats.

- (i) **Grazing, trampling, fire:** Grazing by cattle, trampling and fire are common on all plateaus easily accessible to people except in remote plateaus of Ratnagiri district. Putting fire to the vegetation on plateaus is a regular feature on coastal plateaus. It is not a natural phenomenon, but mostly done by local farmers for rab practice. This causes destruction of fauna and affects seed banks in the shallow soil which are necessary for future growth of vegetation. It may affect the characteristic plant communities in future.
- (ii) **Agriculture:** Agriculture on large scale is not possible on the rocky plateaus. However, on plateaus, local farmers have started cultivation of Alphonso Mango and Cashew nut since last three decades. In recent years, government schemes for reclamation of wastelands for cultivation of fruits plants have affected major parts of the plateau areas in Ratnagiri District. Conversion of plateaus into mango orchards has led to the degradation of many rocky plateaus in Ratnagiri and Sindhudurg districts.
- (iii) **Quarrying:** This has found to be the largest impact on the vegetation of entire Konkan (low-level laterite) areas. The deep layers of laterite are extensively quarried and the bricks (chira/jambha) used for construction locally and as far away fulfil the demand of household construction of Pune and Mumbai.
- (iv) **Developmental projects:** Of the diverse rocky plateaus studied, in Konkan are at most risk, as none of them falls under any legal protected area. These vast and biologically rich plateaus have been claimed for nuclear power plant, conversion of land into intensive urbanization and industrialization. The land conversion is very easy because the rocky plateaus fall under 'wasteland' category. Jaitapur nuclear power plant, Ratnagiri airport, Ratnagiri MIDC, Devrukh township are some examples of development on Konkan plateaus. The sad neglect of such a specialized habitat and its biodiversity needs to be stopped immediately
- (v) **Invasive species:** The species that grow on rocky plateaus are adapted to the extreme physicochemical and climatic conditions of this habitat and have a competitive advantage over other species of more mesic environments.

CONCLUSION

The present enumeration gives an account of floristic diversity of 27 sacred groves located in coastal areas and on lateritic plateaus of Ratnagiri district of Maharashtra state. The present investigation is the outcome of intensive and systematic floristic study of three years. These sacred places maintained by traditional cultural practices by local communities and act as natural hubs for *in situ* conservation of the germplasm. Plant resources used for medicines and food by local communities was also noted and given more focus on RET plant species.

The study reveals the occurrence of 306 plant species from 86 families consisting 102 sp. of herbs, 86 sp. of trees, 41 sp. of shrubs, 30 scandent shrubs, 17 sp. of climbers, 12 sp. of epiphytes; 10 sp. of bulbous herbs including 5 lianas and 3 sp. of parasites out of these about 40% species are found to be endemic and restricted to plateaus only. Among the species recorded from the plateaus studied, 67 are endemic to Western Ghats of which 39 species (58%) are confined to plateaus of the study area. Though the area has human inhabitation, the anthropogenic influences in certain regions are quite high. Reasons for such interference include shifting cultivation for mango and cashew-nut plantation, stone mines (Chire mines) are found to be the major threats for sacred groves of Ratnagiri district. Efforts were also made to understand ethobotanical information of Rare, Endangered and Threatened (RET) plants of the study area and recorded the important data of 78 RET species with their traditional utilization.

During the investigation, 56 bird species, 15 mammal species, 26 reptiles and 06 amphibians and 128 insect species have been reported. Along with this two papers are communicated for publication. In present investigation two Endangered taxa viz., *Brachystelma malwanense* S.R. Yadav & N.P. Singh and *Gymnema khandalense* Santapau were recorded from study area are analysed to understand AM association. The observations taken on animal-plant interactions will help ecologists and scientific community to understand the exact relationship in plant and animals. In microhabitats of such lateritic plateaus a unique ecosystem occurs which includes a plant and animal inter-relationship in sacred groves and adjoining plateau area.

During the exploration plant animal inter-relationship is made for the first time in this area and it is observed that the lateritic plateaus and sacred groves affords shelter for many wild animals, which are dependent directly or indirectly on flora of the forest area. Hence, conservation of the flora will lead to conservation of all life forms associated with it in this area. The outcome of the

present investigation in lateritic plateaus and sacred groves of Ratnagiri district is the first systematic work on endemic plant, medicinal plants and animal-plant inter-relationship.

Some noteworthy outcome of the project-

1. Rediscovery of Critically Endangered taxa *Brachystelma malwanense* Yadav & N.P. Singh (Asclepiadaceae) other than type locality.
2. New record of *Ledebouria karnatakensis* Punekar & Lakshmin. (Hyacinthaceae) from Maharashtra.
3. Data gathered on medicinally important plants found in sacred groves of plateau area of Ratnagiri district.
4. VM association of endangered plant species from the study area.
5. Observation on association of insects and endemic plants like *Moullava spicata*, *Brachystelma malwanense*, *Ledebouria karnatakaensis*.
6. The flora gives an account of an assessment of floristic diversity of sacred groves of lateritic plateaus of Ratnagiri district in Rajapur, Lanja and Ratnagiri Taluka of Maharashtra.
7. Development of nursery for indigenous medicinal plants.
8. Awareness activities among the school childrens, college students and local farmers.
9. Involvement of local communities for the conservation of SGs and the relict plant species form the stuay area.

The present investigation is the outcome of intensive and systematic floristic study, which has been carried out in Ratnagiri district for a period of 3 years. These sacred places maintained by traditional cultural practices act as natural hubs for *in situ* conservation of the germplasm.

List of Research Publications Published and communicated
from the study area by Dr. Shrinath P. Kavade (PI) & Dr. Vikrant B. Berde
(Co-PI)

Papers Published: 04

1. **Shrinath P. Kavade**, Digvijay V. Lawate & Vikrant B. Berde. 2013. An Assessment of Floristic Diversity and Plant-animal Interaction in Coastal Sacred Groves of Ratnagiri District, Maharashtra State. *Journal of Science Information*, Conf. Issue-8: 60-67. **(ISSN: 2229-5836)**.
2. Lawate D.V., V.B. Berde & **Kavade S.P.** 2013. Ophio-fauna of Lanja Tehsil, Ratnagiri, Maharashtra. *Journa of Science Information*, Conf. Issue-8: 16-21. **(ISSN: 2229-5836)**.
3. Berde V.B., **S.P. Kavade**, D.V. Lawate & Berde C.V. 2013. Avifauna on coastal lateritic plateau and associated forest of Ratnagiri. *Journal of Science Information*, Conf. Issue-8: 1-9. **(ISSN: 2229-5836)**.
4. **Kavade S.P.**, D. V. Lawate and Vikrant B. Berde. 2013. Diversity of Bee Plants from Ratnagiri District, Maharashtra. "Two Days State Level Workshop on Bee-keeping". **Souvenir.**

Papers Presented in Conferences: 05

1. Shrinath P. Kavade, Digvijay Lawate and Vikrant B. Berde, Presented paper titled "**An Assessment of Floristic Diversity and Plant-animal Interaction in Coastal Sacred Groves of Ratnagiri District, Maharashtra State**" in National Conference held at Sant Rawool Maharaj Mahavidyalaya, Kuadal, Sindhudurga district on 1st and 2nd March, 2013.
2. Berde V. B., **Kavade S.P.**, Lawate D.V. and C.V. Berde. 2013. Presented paper titled "**Avian fauna on coastal lateritic plateau and associated forest of Ratnagiri**" in National Conference held at Sant Rawool Maharaj Mahavidyalaya, Kuadal, Sindhudurga district on 1st and 2nd March, 2013.
3. Vishal R. Kamble, Dinesh G. Agre, **Shrinath P. Kavade** and Harshal L. Rahate. 2013. "AM association of Critically Endangered taxa *Brachystelma malwanense* S.R. Yadav & N.P. Singh from Maharashtra: A new report". (MS Communicated for First International

and Third National Conference on Biotechnology, Bio-informatics and Bioengineering, Tirupati, Andhra Pradesh).

4. Vishal R. Kamble, **Shrinath P. Kavade**, Lalji R. Kanoujiya. 2013. "The mycorrhizal association of *Gymnema khandalense* Santapau: An endemic and Critically Endangered". (MS Communicated for First International and Third National Conference on Biotechnology, Bio-informatics and Bioengineering, Tirupati, Andhra Pradesh).

Papers Communicated: 02

1. **Shrinath P. Kavade**, Rajendra A. Shevde, Sagar S. Pokale and Vikrant. B. Berde. 2013. "Rediscovery of Critically Endangered taxa *Brachystelma malwanense* Yadav & N.P. Singh (Asclepiadaceae) other than type locality". (MS Communicated).
2. **Shrinath P. Kavade**, Sagar S. Pokale and Vikrant. B. Berde. 2013. "New record of *Ledebouria karnatakensis* Punekar & Lakshmin. (Hyacinthaceae) from Maharashtra". (MS Communicated).

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