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PHYTOSOCIOLOGICAL STUDIES ON WANZALOLI SACRED GROVE OF DAPOLI TAHSIL, DISTRICT RATNAGIRI (M.S.), INDIA.

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Abstract:
Sacred groves are the forests or places preserved on religious grounds near the village or away from the village. Wanzaloli sacred grove having area 8.17 hectors and is 42 K.M. to West-North side from Dapoli city. To study the distribution, dominance, ecological success of species in community and structure of community, phytosociological studies were carried out in 2012-2013. It was observed that, the vegetation in sacred grove is moist semi-evergreen type. Total 54 species belongs to 47 genera of total 29 families are reported. *Mammea suriga* (Butch.Ham.Ex Roxb.) Kosterm, *Mangifera indica* L. *Ixora brachiata* Roxb., *Holigarna arnottiana* Hook., *Combretum latifolium* Bl., *Zanthoxylum rhetsa* Dc. and *Xantolis tomentosa* (Roxb.) Raf. are well distributed in the study area. Based on basal area and IVI values the plants like *Antiaris toxicaria* (Pers.) Leschen., *Bombax ceiba* L., *Combretum latifolium* Bl., *Ficus parasitica Koen. ex. Willd.*, *Garcinia xanthochymus* Hook., *Ixora brachiata* Roxb., *Mammea suriga* (Butch. Ham.Ex Roxb.) Kosterm., *Mangifera indica* L., *Terminalia bellerica* Roxb., *Terminalia chebula* Retz., *Xantolis tomentosa* (Roxb.) Raf. *Gmelina arborea* Roxb. and *Ficus calosa* Willd are dominant and ecologically more successful species in study area.

Keywords: Sacred grove, Phytosociological, distribution, dominant, semi-evergreen, community, etc.

Introduction

Forest pockets preserved on religious grounds are known as sacred graves / Dev - rai (Vartak et al. 1986). Well preserved sacred groves support the climax type of vegetation rich in species of trees, herbs, shrubs and climbers, such groves contains different birds and wild animals. The sacred groves play an important role in preservation of plant species which are very rare or extinct elsewhere. The sacred groves show optimum growth of the vegetation relevant to local terrain and climate. Apart from lofty and magnificent trees many rare and endangered species are also associated with sacred groves (Vartak et al., 1987).

Vartak and Gadgil (1981) studied the Janni Grove of Mangoan of Poona district in respect to study the flora, ecological aspects and ethno-botany. After exploration of sacred groves in Southern–Western Ghats in Kerala, Unikrishnan (1990) noted the various ecological roles of sacred groves in that area. Kulkarni and Nipunage (2009) evaluated floristic diversity and ecological aspect of Dhup-Rahat form Pune district. They reported that the name Dhup-Rahat is given due to magnificent trees of Dhup (Canarium strictum Roxb.) very rare plant in Maharashtra. They also reported 29 species with their mean frequency.

Topography & Climatic factors of study areas – Dapoli:

Topography and climatic factors determines the type of vegetations. Hence, the study of ethnographic study is necessary which includes the physical and climatic conditions of region. It includes the various factors like topography, location, climate, rainfall, soil, irrigation etc.

The topography Dapoli tahsil is totally hilly area. It lies between 17°4–54" North latitude and 73°10–39" East longitude and 250 mts. altitude. The predominant soil in the tahsil is lateritic, which vary in colour from bright red to brownish red. The soil is acidic, rich with iron and organic matter. The water holding capacity of soil is poor, and immediately dries after the rainfall. Being a costal tahsil, the variation in the temperature during the day time throughout the year is not large. The average maximum temperature not goes beyond 32°C and minimum temperature 20°C. The average humidity ranges from 69 to 95% (Anonymous 1962). The entire annual rainfall occurs during the month of June to October. Usually, in July month the heaviest rainfall is received. The average rainfall received was about 3800 mm/annum (Anonymous, 2008 to 2012).

Wanzaloli is a small village with total population of about 600 and is 42 Km away to West-North side of Dapoli. The ownership of the Wanzaloli sacred grove is in the hands of Revenue department. It covers total 8.15 hectors area with Jakmata, Kaleshwari and Shankar Deities and well preserved moist semi-evergreen forest. The quantitative study of vegetation is called Phytosociology. To study the distribution, dominance, ecological success of species in community and structure

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of community, the present topic entitled, "Phytosociological studies on Wanzaloli Sacred grove of Dapoli Tahsil, District Ratnagiri (M.S.), India." was undertaken in 2012-2013.

Materials and Methods

Frequent field visits were organized to Wanzaloli sacred grove to study the phyto-sociological aspects. 10 Quadrates of 10 M x 10 M were laid down randomly at different height in sacred grove. The number of plants of each species was listed and the diameter at breast height (DBH) of the species above 50.00 cm was recorded. The Phyto-sociological parameters like relative frequency, relative density, abundance, basal area and importance value index (IVI) for each species were calculated. Dispersion of plant species in a community (Frequency), numerical strength of the species (density) and dominance was studied by the following methods of Misra (1968) and Pandeya et al. (1968). The phyto-sociological data recorded during observation was analyzed. In order to study the ecological success and dominance plant species in community with single value, Important Value Index are calculated and shown in following Table no.01. The frequency classes are analyzed and shown in table no. 2.

The plant specimens in flowering or fruiting condition were collected. The collected plant species were identified using flora of the Presidency of Bombay (Cooke, 1958); Flora of Maharashtra State Monocotyledons (Sharma et al., 1996); Flora of Maharashtra State Dicotyledons Vol-I (Singh et al. 2000); Flora of Maharashtra State Dicotyledons Vol-II (Singh et al. 2001) and Flora of Sawantwadi (Kulkarni, 1988).The collected plant specimens were preserved (Jain and Rao, 1977).

The plants are deposited as voucher specimens in the Herbarium of the Department of Botany, Dapoli Urban Bank Senior Science College Dapoli, Dist. Ratnagiri (M.S.). The plants which falls under RET categories, their photographs were maintained due to rarity.

Result and Discussion:

Basal area refers to the ground actually penetrated by the stem. It is one of the chief characteristics to determine dominance. It is clear that species like Antiaris toxicaria (Pers.) Leschen, Ficus parasitica Koen. ex. Willd.,Terminalia bellerica Roxb., Bombax ceiba L. Holigarna arnottiana Hook. Terminalia chebula Retz.,Gmelina arborea Roxb., Ficus calosa Willd. are dominant in the study area.

In order to study the ecological success and dominance plant species in community with single value, Important Value Index are calculated. The highest IVI value of 10 species are Antiaris toxicaria (Pers.) Leschen. (33.98), Mammea suriga (Butch. Ham.Ex Roxb.) Kosterm.(28), Mangifera indica L.(15.67), Terminalia bellerica Roxb. (14.01), Terminalia chebula Retz.(14.01), Ixora brachiata Roxb.(10.37), Garcinia xanthochymus Hook.(8.5), Ficus parasitica Koen. ex. Willd. (8.49)., Zanthoxylum rhetsa Dc.(7.58) and Xantolis tomentosa (Roxb.) Raf. (7.52). This indicates that these 10 species are dominant and more ecologically successful species from Wanzaloli sacred grove.

Table No.1: General ecological parameters.

Sr. No.	Botanical Name	IT.	OCC	FRE	ABD	DEN	BA	R.De.	R.F.	R.D	I.V.I.
1	*Acacia catechu* (L.) Willd.	04	02	20	02	0.4	0.06	1.80	1.45	0.26	3.51
2	*Antiaris toxicaria* (Pers.) Leschen.	02	02	20	01	0.2	7.15	0.90	1.45	31.63	33.98
3	*Aprosa lindleyana (Wight) Baill.*	02	02	20	01	0.2	0.13	0.90	1.45	0.57	2.92
4	*Argyreia nervosa* Bojer.	01	01	10	01	0.1	0.001	0.45	0.72	0.004	1.17
5	*Bauhinia racemosa* Lam.	01	01	10	01	0.1	0.07	0.45	0.72	0.30	1.47
6	*Bombax ceiba* L.	04	02	20	02	0.1	0.91	1.80	1.45	4.012	7.26
7	*Calycopteris floribunda* (Roxb.) Poir.	05	04	40	1.25	0.5	0.08	2.26	2.91	0.35	5.52
8	*Careya arborea* Roxb.	03	03	30	01	0.3	0.45	1.35	2.18	1.99	5.52
9	*Carissa congestaWight* var.*congesta*	06	03	30	02	0.6	0.002	2.71	2.18	0.008	4.89
10	*Caryota urens* Linn	05	04	40	1.25	0.5	0.06	2.26	2.91	0.26	5.43
11	*Combretum latifolium* Bl.	06	06	60	01	0.6	0.04	2.71	4.37	0.17	7.25
12	*Derris scandens* Benth.	01	01	10	01	0.1	0.07	0.45	0.72	0.30	1.47
13	*Dillenia pentagyna* Roxb.	03	03	30	01	0.3	0.30	1.35	2.18	1.32	4.85
14	*Diploclisia glaucescens* (Bl.) Diels	01	01	10	01	0.1	0.005	0.45	0.72	0.02	1.19
15	*Entada rheedei* spreng	01	01	10	01	0.1	0.08	0.45	0.72	0.35	1.52

16	*Ficus callosa* Willd	02	02	20	01	0.2	0.98	0.90	1.45	4.33	6.68
17	*Ficus exasperata*Vahl	01	01	10	01	0.1	0.01	0.45	0.72	0.04	1.21
18	*Ficus parasitica Koen. ex. Willd.*	04	03	30	1.33	0.4	1.02	1.80	2.18	4.51	8.49
19	*Ficus virens* (lacor) Roxb.	01	01	10	01	0.1	0.69	0.45	0.72	3.05	4.22
20	*Firmiana colorata* (Roxb.) R. Br.	01	01	10	01	0.1	0.03	0.45	0.72	0.13	1.3
21	*Garcinia indica* Choiss	05	03	30	1.66	0.5	0.12	2.26	2.18	0.53	4.97
22	*Garcinia xanthochymus* Hook	12	04	40	03	1.2	0.04	5.42	2.91	0.17	8.5
23	*Gmelina arborea* Roxb.	02	02	20	01	0.2	0.69	0.90	1.45	3.05	5.4
24	*Gnetum ula* Roxb.	03	03	30	01	0.3	0.08	1.35	2.18	0.35	3.88
25	*Helicteres isora* L.	01	01	10	01	0.1	0.01	0.45	0.72	0.04	1.21
26	*Holarrhena pubescens* wall	01	01	10	01	0.1	0.00 03	0.45	0.72	0.00 1	1.17
27	*Holigarna arnottiana* Hook.	06	05	50	1.2	0.6	0.03	2.71	3.64	0.13	6.48
28	*Holoptelea integrifolia* (Roxb.)Planch.	02	02	20	01	0.2	0.75	0.90	1.45	3.31	5.66
29	*Ixora brachiata* Roxb.	11	07	70	1.57	1.1	0.07	4.97	5.10	0.30	10.3 7
30	*Leea macrophylla* Roxb.	03	01	10	03	0.3	0.00 03	1.35	0.72	0.00 1	2.07
31	*Macaranga peltata* (Roxb.) Muell.	03	03	30	01	0.3	0.04	1.35	2.18	0.17	3.7
32	*Mammea suriga* (Butch. Ham. Ex Roxb.) Kosterm.	45	10	100	4.5	4.5	0.08	20.3 6	7.29	0.35	28
33	*Mangifera indica* L.	14	09	90	1.55	1.4	0.63	6.33	6.56	2.78	15.6 7
34	*Memecylon umbellatum* Burm. Var. umbellatum	09	04	40	2.25	0.9	0.05	4.07	2.91	0.22	7.2
35	*Meyna laxiflora* Robyns	04	02	20	02	0.4	0.05	1.80	1.45	0.22	3.47
36	*Mimusops elengi* L.	03	03	30	01	0.3	0.69	1.35	2.18	3.05	6.58
37	*Mucuna monosperma* DC.	01	01	10	01	0.1	0.00 2	0.45	0.72	0.00 8	1.17
38	*Plumeria rubra* L.	01	01	10	01	0.1	0.78	0.45	0.72	3.45	4.62
39	*Saraca asoca* Linn	03	01	30	03	0.3	0.05	1.35	0.72	0.22	2.29
40	*Smilax ovalifolia* Roxb.	05	02	20	2.5	0.5	0.00 03	2.26	1.45	0.00 1	3.71
41	*Sterculia guttata* Roxb.	02	02	20	01	0.2	0.09	0.90	1.45	0.39	2.39
42	*Symphorema involucratum* Roxb.	02	02	20	01	0.2	0.01	0.90	1.45	0.04	2.39
43	*Syzygium cumini* (L) Skeels	02	02	20	01	0.2	0.98	0.90	1.45	4.33	6.68
44	*Syzygium tamilnadensis* Radhakr.& Chithra	01	01	10	01	0.1	0.07	0.45	0.72	0.30	1.47
45	*Tectona grandis* L.	01	01	10	01	0.1	0.08	0.45	0.72	0.35	1.52
46	*Terminalia bellerica* Roxb.	03	03	30	01	0.3	2.37	1.35	2.18	10.4 8	14.0 1
47	*Terminalia chebula* Retz.	01	01	10	01	0.1	1.58	0.45	0.72	6.99	14.0 1
48	*Terminalia elliptica* Willd.	01	01	10	01	0.1	0.13	0.45	0.72	0.57	1.74
49	*Thespesia populnea* (L.) Soland.	01	01	10	01	0.1	0.38	0.45	0.72	1.68	2.85
50	*Ventilago maderaspatana* Gaertn. *Var. maderaspatana*	01	01	10	01	0.1	0.01	0.45	0.72	0.04	1.21
51	*Vitex leucoxylon L.*	02	01	10	02	0.2	0.22	0.90	0.72	0.97	2.59
52	*Xantolis tomentosa* (Roxb.) Raf.	08	05	50	1.6	0.8	0.07	3.61	3.64	0.30	7.52
53	*Zanthoxylum rhetsa* Dc.	06	05	50	1.2	0.6	0.28	2.71	3.64	1.23	7.58
54	*Ziziphus rugosa* Lam. Var. ***rugosa***	02	02	20	01	0.2	0.03	0.90	1.45	0.13	2.48

(IT = Total no. of individuals; OCC = Occurrences; FRE = Frequency; ABD = Abundance; DEN = Density; BA = Basal area in Sq. m., RF = Relative frequency; R. Do. = Relative dominance; R. De. = Relative density; I.V.I. = Importance value index)

Table No. 2: Frequency classes and No. of plant species observed:

Frequency %	Frequency class	No. of species Observed
0-20	A	33
21-40	B	14
41-60	C	04
61-80	D	01
81-100	E	02
Total species		54

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The analysis of frequency classes of reported species from study area falls in five classes. 'A' class is represented by 33 species followed by 'B' class with having 02 species and 'D' class with having 01 species, so this result shows heterogeneity in the vegetation of Wanzaloli sacred grove

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Well conserved sacred grove of Wanzaloli