

# Plant Community Analysis at Thakurwadi Village, Badlapur, Maharashtra, India

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**Abstract** – A Phytosociological study on the vegetation community was carried out at Thakurwadi village of Badlapur area, Maharashtra, India during 2018-2019. The main objectives of this study were to measure the frequency percentage, density, abundance, relative frequency, relative density, relative dominance and importance value index cohabiting in this locality. A total of 10 quadrats measuring 1.0m<sup>2</sup> were laid randomly. The results showed that there are eight genera and six families. The most common species in this study area is *Alternanthera triandra* belonging to family *Amaranthaceae*.

**Keywords:** Dominant species, Ecological parameters, Sociability, Quadrat

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## INTRODUCTION

Vegetation in any natural habitat not only undergoes development but also shows structural organization. The study of the detailed structure, description and classification of plant community is called as phytosociology. Phytosociological study gives information on the distribution of species resulting in evolution of vegetation (Soave, 2003). In the community, the individuals of all the species are not evenly distributed. Individuals of some species are widely spaced while those of some others are found in clumps or mats. The distribution patterns of individuals of different species indicate their reproductive capacity as well as their adaptability to sustain the environment. Thakurwadi is a small village in Ambarnath taluka, Badlapur (West) at Thane district of Maharashtra state. It comes under Mulgaon Grampanchayat. It is 57 kilometres from Mumbai. It lies between 19° 10' 0.4224" North latitude and 73° 14' 12.4584" East longitude, at an elevation of 23 meters. At this region the temperature in summer ranges from 26.4°C to 35.2°C and in winter from 17.8°C to 30.9°C. The precipitation varies 1246mm between the driest and the wettest month.

The present study gives an insight of the phytosociology of the standing vegetation including study of perpetuation of species in this locality.

## MATERIALS AND METHODS

### Study area

This study was conducted at Thakurwadi village. A total of 10 quadrats measuring 1.0m<sup>2</sup> were studied. Scientific names of each weed species was identified and recorded. Frequency percentage, density and abundance of all species were studied and calculated according to Raunkier (1934). Thereafter, relative frequency, relative density, relative dominance and importance value index (IVI) were estimated. The data were compiled and were analysed for qualitative and quantitative study using following formulae – (Oosting, 1958; Phillips, 1959; Hanson and Churchill, 1961)

$$\text{Frequency percentage} = \frac{\text{Total number of quadrats in which the species occur}}{\text{Total number of quadrats studied}} \times 100$$

$$\text{Density} = \frac{\text{Total number of individual species}}{\text{Total number of quadrat studied}}$$

$$\text{Abundance} = \frac{\text{Total number of individual species}}{\text{Total number of quadrat in which species occur}}$$

$$\text{Relative Frequency} = \frac{\text{Frequency of the species in stand } x}{\text{Sum of the frequencies for all species in stand } x} \times 100$$

$$\text{Relative Density} = \frac{\text{Total number of individuals of a species}}{\text{Total number of individuals of all species}} \times 100$$

$$\text{Average basal area} = \sum \pi r^2 / N$$

Total basal area of a species (sq. mm/sq.m)

$$= \text{Average basal area (sq. mm)} \times \frac{\text{Number of individuals per quadrat}}{\text{Size of quadrat (sq.m)}} \times 100$$

$$\text{Relative Dominance} = \frac{\text{Total basal area of the species in all the quadrats}}{\text{Total basal area of all the species in all the quadrats}} \times 100$$

Importance Value Index (IVI) of a species =

$$\text{Relative frequency} + \text{Relative density} + \text{Relative dominance}$$

## RESULTS AND DISCUSSION

The study site is shown in the enlarged view of the map of India marked as a star (Figure 1). A total of eight species belonging to eight genera and six families were identified from the area of study. The most dominant species among the weed species was identified and was found to be *Alternanthera triandra* (159) belonging to the family Amaranthaceae, followed by *Achyranthes aspera* (53) from the same family (Table 1). *Chenopodium album* and *Acalypha indica* belonging to family Amaranthaceae and Euphorbiaceae, respectively showed equal number of individuals (18). *Peristrophe bicalyculata* belonging to family Acanthaceae showed poor number (05). *Alternanthera triandra*, *Achyranthes aspera* and *Chenopodium album* were present in all the 10 quadrats studied however, *Calotropis procera* and *Acalypha indica* were also few in number (08). *Cassia obtusifolia* and *Blumea lacera* were present in 07 quadrats. *Peristrophe bicalyculata* was observed only in four quadrats. Similar results were observed in Frequency percentage, density and abundance. It was observed that the relative dominance of *Achyranthes aspera* was less (3.33) than *Cassia obtusifolia* (23.63) though the number of individual species of *Achyranthes aspera* was more than *Cassia obtusifolia* that is 53 and 10, respectively. The importance value index (IVI) was found to be highest in *Alternanthera triandra* that is 128.33 followed by *Cassia obtusifolia* (38.05) which is very close to *Achyranthes aspera* (37.48). IVI of *Calotropis procera* and *Acalypha indica* are very close to each other and that is 21.91 and 21.53, respectively. Minimum IVI was recorded in *Peristrophe bicalyculata* (10.99).

Sarah *et al.* (2015) recorded a total of 59 species belonging to 54 genera and 34 families identified in the 10 plots studied at Ayer Hitam Forest Reserve, Selangor, Malaysia. Knox (2017) observed that at Sanjay Gandhi National Park the vegetation is more towards homogeneity. The dominant species at this site was *Arundinella pumila* followed by *Convolvulus arvensis*. Oudhia (1999) conducted a phytosociological survey in wasteland during rainy season and recorded about 27 weed species. Ecological survey conducted by Jaggi *et al.* (2012) in Agra also revealed the similar findings.

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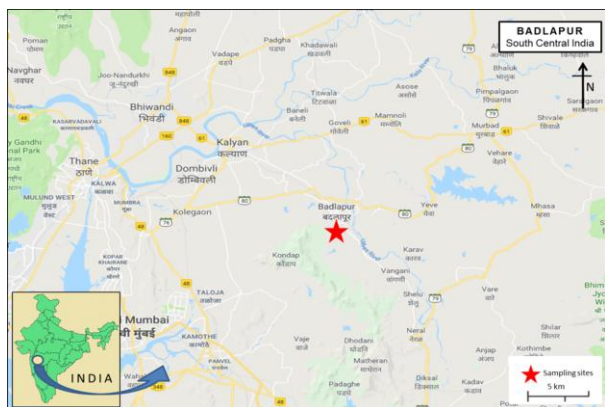
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**Table 1. Phytosociological Analysis of Plant Community at Study Site**

Plant Species	Total no of individual Species	Total no of quadrat in which species occur	Total no of quadrat studied	Frequency percentage	Density	Abundance	Relative frequency	Relative density	Relative dominance	IVI*
<i>Alternanthera triandra</i>	159	10	10	100	15.9	15.9	15.62	55.59	57.12	128.33
<i>Achyranthes aspera</i>	53	10	10	100	5.3	5.3	15.62	18.53	3.33	37.48
<i>Calotropis procera</i>	15	08	10	80	1.87	1.87	12.50	5.24	4.17	21.91
<i>Cassia obtusifolia</i>	10	07	10	70	1.42	1.42	10.93	3.49	23.63	38.05
<i>Peristrophe bicalyculata</i>	05	04	10	40	1.25	1.25	6.25	1.74	3.00	10.99
<i>Blumea lacera</i>	08	07	10	70	1.14	1.14	10.93	2.79	3.43	17.15
<i>Chenopodium album</i>	18	10	10	100	1.8	1.80	15.62	6.29	2.54	24.45
<i>Acalypha indica</i>	18	08	10	80	1.8	2.25	12.50	6.29	2.74	21.53

\*Importance Value Index



**Figure-1. Study Site**

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