

# A COMPREHENSIVE INVESTIGATION INTO THE DIVERSITY OF FLORA WITHIN THE COLLEGE CAMPUS ENVIRONMENT

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## Abstract:

This study aims to investigate the biodiversity in the Arts, Commerce and Science College, Bodwad campus area, which is situated in the Jalgaon district and is a part of the Khandesh and Northern Maharashtra regions of Maharashtra. The study was carried out over the course of a year, from January to December 2023, in order to catalog every plant on college property. For this survey, the line transect approach was used. To gather data for the entire season, this poll was carried out once a week. Throughout this investigation, a wide variety of plants, shrubs, trees, climbers, and lianas were seen. At Bodwad College, 38 families representing 82 genera were identified. Throughout this study, a large range of total species were seen. The college campus is selected for the above study with the intention of conserving and protecting biodiversity. It is acknowledged that efforts must be made to preserve this biodiversity and it requires continuous monitoring.

**Key words:** Biodiversity, flora, Bodwad, Campus, Monitoring, Survey.

## Introduction

The biodiversity of terrestrial ecosystems is a topic of paramount importance in contemporary ecological discourse, with particular attention devoted to understanding the intricate dynamics of plant communities within diverse habitats. In this context, college campus represents unique ecological microcosms, characterized by a mosaic of built infrastructure and green spaces that harbour a myriad of plant species. Despite their ubiquity and potential ecological significance, the botanical composition of college campuses remains relatively underexplored within academic literature.

The present investigation seeks to address this critical knowledge gap by undertaking a comprehensive study of flora diversity within the confines of Arts, Commerce and Science College, Bodwad campus. The rationale for focusing on college campuses as study sites is multifaceted, encompassing ecological, educational, and practical considerations. Firstly, college campuses often serve as repositories of botanical diversity, harbouring a wide array of native and introduced plant species within their diverse landscapes. Secondly, the juxtaposition of natural and anthropogenic elements within campus environments provides a unique opportunity to study the interplay between human activities and plant community dynamics. Lastly, given the pivotal role of educational institutions in shaping societal attitudes towards environmental stewardship, an in-depth understanding of campus flora diversity holds considerable pedagogical value.

Our country is full of Biodiversity. Out of 25 world's Biodiversity hotspots, two are found in India only. Biodiversity includes all genes, species and ecosystems in a region (FES,2010). Therefore, no matter how small, each species present in particular ecosystem is important in that ecosystem. Biodiversity, its

knowledge and its proper use and conservation is very important to maintain the balance as well. Therefore it is very important to have knowledge of biodiversity and its proper utilization for a sustainable livelihood. In order to preserve this diversity, we need to first understand the diversity we have. While efforts have been taken on large scale for some economically important groups, but other scattered groups or diversity are still not properly collected and documented. If the balance of the environment is to be maintaining, then we need to be aware of the diversity around us. With the aim of this we collected information of every plant available in the campus area of our Institute to make database of existing plant diversity.

Firstly, we aim to catalog and taxonomically classify the various plant species present within Arts, Commerce and Science College, Bodwad campus, elucidating their distribution patterns and abundance across different ecological niches. Secondly, we seek to assess the influence of anthropogenic factors, such as land use practices and urbanization, on the composition and structure of campus vegetation. Thirdly, we endeavour to explore the ecological functions served by campus flora, including their role in supporting biodiversity, mitigating environmental stressors, and enhancing ecosystem services.

To achieve these objectives, the research methodology adopted herein entails a multi-faceted approach integrating field surveys, botanical sampling, and data analysis techniques. By systematically documenting the botanical diversity of Arts, Commerce and Science College, Bodwad campus, this study aspires to contribute valuable insights to the fields of ecology, conservation biology, and landscape management. Furthermore, the findings of this investigation hold practical implications for campus administrators, urban planners, and environmental educators, informing evidence-based decision-making processes aimed at enhancing the ecological sustainability and educational value of college campuses.

## Material and Methods

**Study area:** Bodwad's Arts, Commerce, and Science College occupies 4.2 acres. Bodwad is located in latitude 20.901903 and longitude 76.017433. It is situated at a height of 686 feet, or 209 meters, above sea level. There is dry deciduous vegetation in this area. There is some loamy soil in this location. Bodwad Village occupies a total area of 2232.7 Hectares, or 22.32 KM<sup>2</sup>. Bodwad is a tiny town in Maharashtra, India's Jalgaon district. It is a part of Northern Maharashtra and Khandesh.

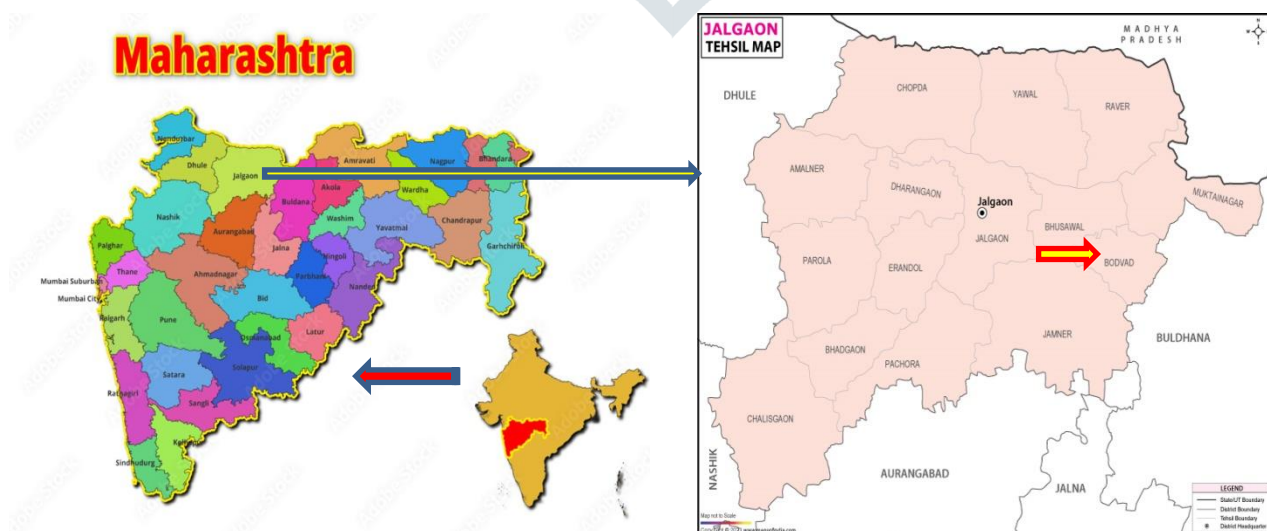


Figure 1: Map Showing Bodwad in Jalgaon district marked in Maharashtra of India.

This study was carried out in several campus locations from June 2022 to May 2023 over the course of a year. Every week, a survey was carried out to inventory every species on the campus by using random sampling method. Each species was identified with the use of flora-based literature found in the campus



library and Taxonomic specialists were also involved in the identification of the plant specimen. Additionally, pictures were taken.

Field trips were conducted during the research period to every nook and cranny of the university campus in an effort to identify local vascular plant species. A regular survey was conducted to identify and gather data on the various plant species found on campus, along with information on their Vernacular name, botanical names, families, habit, uses, and human disturbances of the surrounding natural flora. The plant species that were encountered were categorized into trees, shrubs, herbs, climbers, grasses, and pteridophytes based on their habit (life form).



Figure 2: Plate showing images of Campus of Bodwad College

### Observation:

It was noted that a variety of trees, shrubs, herbs, climbers, palms, several Gymnosperm species, Pteridophytes, and other plants are found on campus. While some plants have grown naturally, others have been planted for education purposes and to enhance the campus's aesthetic appeal. A total of 38 families and approximately 82 genera were identified in the vicinity of the college campus. These details were

enumerated and included the common name, scientific name, order, family and habit. List of recorded Angiosperms, Gymnosperm and Pteridophytes is mentioned in Table 1 and order wise percent composition is shown in figure 6. *Acalypha indica*, *Polyalthia longifolia*, *Peltophorum pterocarpum*, *Azadiracta indica* and *Pongamia pinnata* are the most prevalent angiosperm species in the research area, according to the survey. On campus, there are also several medicinal plants.

The following checklist was observed in our study area.

Table 1: Checklist of Floral diversity with respective order and family

Angiosperm (Dicotyledons)					
Sr. No	Vernacular Name	Botanical Name	Family	Habit	Order
1	Bitti	<i>Thevetia peruviana</i>	Apocynaceae	shrub	Gentianales
2	Madhukamini	<i>Murrya exotica</i>	Rutaceae	Shrub	Sapindales
3	Shankasur	<i>Caesalpinia pulcherima</i>	Caesalpiniaceae	Shrub	Fabales
4	Scarlet ixora	<i>Ixora coccinia</i>	Rubiaceae	Shrub	Gentianales
5	Golden dew drops	<i>Duranta repens</i>	Verbanaceae	Shrub	Lamiales
6	Acalypha	<i>Acalypha wilkesiana</i>	Euphorbiaceae	Shrub	Malpighiales
7	Ganeshvel	<i>Ipomea</i>	Convolvulaceae	Climber	Polemoniales
8	Chandani	<i>Tabernaemontana divaricata</i>	Apocynaceae	Shrub	Gentianales
9	Tecoma	<i>Tecoma stans</i>	Bignoniaceae	Shrub	Lamiales
10	Adulsa	<i>Adhatoda vasica</i>	Acanthaceae	Herb	Lamiales
11	Tulsi	<i>Oscimum sanctum</i>	Labiatae	Shrub	Lamiales
12	Sitaphal	<i>Annona squamosa</i>	Annonaceae	Shrub	Magnoniales
13	Nerium	<i>Nerium oleander</i>	Apocynaceae	Shrub	Gentianales
14	Jaswand	<i>Hibiscus rosa-sinensis</i>	Malvaceae	Shrub	Malvales
15	Gokarna	<i>Clitoria ternatea</i>	Papilionaceae	climber	Fabales
16	Ashok	<i>Polyalthia longifolia</i>	Annonaceae	Tree	Magnoniales
17	Lajalu	<i>Mimosa pudica</i>	Mimosaceae	Herb	Fabales
18	Rose	<i>Rosa indica</i>	Rosaceae	Shrub	Rosales
19	Madhumalati	<i>Quisqualis indica</i>	Combretaceae	Woody climber	Myrtales
20	Halad	<i>Curcuma longa</i>	Zinziberaceae	Herb	Zinziberales
21	Korphad	<i>Aloe vera</i>	Liliaceae	Herb	Liliales
22	Shatavari	<i>Asparagus</i>	Liliaceae	Climber	Liliales
23	Hirva chafa	<i>Artabotrys hexapatalous</i>	Annonaceae	Climber	Magnoniales
24	Kardali	<i>Canna indica</i>	Cannaceae	Herb	Zinziberales

25	Awala	<i>Embllica officinalis</i>	Phyllanthaceae	Tree	Malpighiales
26	Gulmohar	<i>Delonix regia</i>	Caesalpiaceae	Tree	Fabales
27	Parijatak	<i>Nyctanthus arbo-tristis</i>	Oleaceae	Shrub	Lamiales
28	Behada	<i>Terminalia bellerica</i>	Combretaceae	Tree	Myrtales
29	Jai	<i>Jasminium auriculatum</i>	Oleaceae	Climber	Lamiales
30	Kunda	<i>Jasminium angustifolium</i>	Oleaceae	Climber	Lamiales
31	Mogara	<i>Jasminium sambac</i>	Oleaceae	Climber	Lamiales
32	Kadipatta	<i>Murraya rocnigii</i>	Rutaceae	Shrub	Sapindales
33	Vilayati chinch	<i>Pithecolobium dulce</i>	Papilionaceae	Tree	Fabales
34	Saptaparni	<i>Alstonia scholaris</i>	Apocynaceae	Tree	Gentianales
35	Karanj	<i>Pongamia pinnata</i>	Papilionaceae	Tree	Fabales
36	Teak	<i>Tectona grandis</i>	Lamiaceae	Tree	Lamiales
37	Umber	<i>Ficus racemosa</i>	Moraceae	Tree	Rosales
38	Neem	<i>Azadiracta indica</i>	Meliaceae	Tree	Sapindales
39	Sarpagandha	<i>Rauwolfia serpentina</i>	Apocynaceae	Herb	Gentianales
40	Chandrajyot	<i>Jatropha curcus</i>	Euphorbiaceae	Tree	Malpighiales
41	Golden trumpet	<i>Allamanda cathartica</i>	Apocynaceae	Climber	Gentianales
42	Ashvagandha	<i>Withania somnifera</i>	Solanaceae	Herb	Polemoniales
43	Jamun	<i>Syzygium cumini</i>	Myrtaceae	Tree	Myrtales
44	Din ka Raja	<i>Cestrum diurnum</i>	Solanaceae	Climber	Polemoniales
45	Nilgiri	<i>Eucalyptus camandulansis</i>	Myrtaceae	Tree	Myrtales
46	Lalpatti	<i>Eubhorbia pulcherima</i>	Euphorbiaceae	Herb	Malpighiales
47	Pivla gulmohar	<i>Peltophorum pterocarpum</i>	Caesalpiaceae	Tree	Fabales
48	Bhokar	<i>Cordia dichotoma</i>	Boraginaceae	Tree	Boraginales
49	Spicy jatropa	<i>Jatropha integerrima</i>	Euphorbiaceae	Shrub	Euphorbiales
50	Chafa	<i>Plumeria alba</i>	Apocynaceae	Tree	Gentianales
51	Amaltas	<i>Cassia fistula</i>	Caesalpiaceae	Tree	Fabales
52	Deshi badam	<i>Terminalia catappa</i>	Combretaceae	Tree	Myrtales
53	Rui	<i>Calatropis procera</i>	Apocynaceae	Shrub	Gentianales
54	Pipal	<i>Ficus religiosa</i>	Moraceae	Tree	Rosales
55	Ghaneri	<i>Lantana camara</i>	Verbenaceae	Shrub	Lamiales
56	Dudhi	<i>Euphorbia hirta</i>	Euphorbiaceae	Herb	Malphiales
57	Phuli/dagadi pala	<i>Tridax procumbens</i>	Asteraceae	Herb	Asterales
58	Ground spurge	<i>Euphorbia prostrata</i>	Euphorbiaceae	Herb	Malphiales



59	Durva grass	<i>Cynodon dactylon</i>	Poaceae	Herb	Cyperales
60	Goose grass	<i>Eleusine indica</i>	Poaceae	Herb	Cyperales
61	Crab grass	<i>Digitaria sanguinalis</i>	Poaceae	Herb	Cyperales
62	Gajar gavat	<i>Parthenium hysterophorus</i>	Asteraceae	Herb	Asterales
63	Dhotra	<i>Datura spp.</i>	Solanaceae	Shrub	Polemoniales
64	Gokharu	<i>Indigofera cordifolia</i>	Papilionaceae	Herb	Fabales
65	Ghol	<i>Portulaca oleracea</i>	Portulacaceae	Herb	Caryophyllales
66	Pathri	<i>Launaea sarmentosa</i>	Asteraceae	Herb	Asterales
67	Carpet weed	<i>Alternanthera pungens</i>	Amaranthaceae	Herb	Caryophyllales
68	Sahdevi	<i>Vernonia cinerea</i>	Asteraceae	Herb	Asterales
69	Ambushi	<i>Oxalis corniculata</i>	Oxalidaceae	Herb	Geraniales
70	Eyebane	<i>Euphorbia nutans</i>	Euphorbiaceae	Herb	Malpighiales
71	Jangali chavali	<i>Amaranthus viridis</i>	Amaranthaceae	Herb	Caryophyllales

### Angiosperm (Monocotyledons)

Sr. No	Vernacular Name	Botanical Name	Family	Habit	Order
1	Tradescantia	<i>Tradescantia sp.</i>	Commelinaceae	Herb	Commelinales
2	Areca palm	<i>Chrysalidocarpus lutescence</i>	Arecaceae	Shrub	Arecales
3	Bottle palm	<i>Hyophorbe lagenicaulis</i>	Arecaceae	Shrub	Arecales
4	Kardali	<i>Canna indica</i>	Cannaceae	Herb	Zinziberales
5	Foxtail palm	<i>Wodyetia bifurcata,</i>	Arecaceae	Tree	Arecales
6	Fan Palm	<i>Livistona chinensis</i>	Arecaceae	Herb	Arecales
7	Ghaypat	<i>Agave angustifolia</i>	Asparagaceae	Herb	Asparagales

### Gymnosperms

Sr. No	Vernacular Name	Botanical Name	Family	Habit	Order
1	Thuja	<i>Thuja occidentalis</i>	Cupresaceae	Herb	Cupresales
2	X-MAS Tree	<i>Araucaria-Columnaris</i>	Araucariaceae	Tree	Araucariales
3	Cycas	<i>Cycas revoluta</i>	Cycadaceae	Tree	Cycadales

Pteridophytes					
Sr. No	Vernacular Name	Botanical Name	Family	Habit	Order
1	Necha	<i>Nephrolepis exaltata</i>	Nephrolepidaceae	Herb	Polypodiales

		
<i>Tridax procumbens</i> L.	<i>Cassia uniflora</i> Miller.	<i>Adhatoda vasica</i>
		
<i>Quisqualis indica</i>	<i>Jatropha integerrima</i>	<i>Plumeria alba</i>
		
<i>Wodyetia bifurcata</i> ,	<i>Agave angustifolia</i>	<i>Ixora coccinia</i>



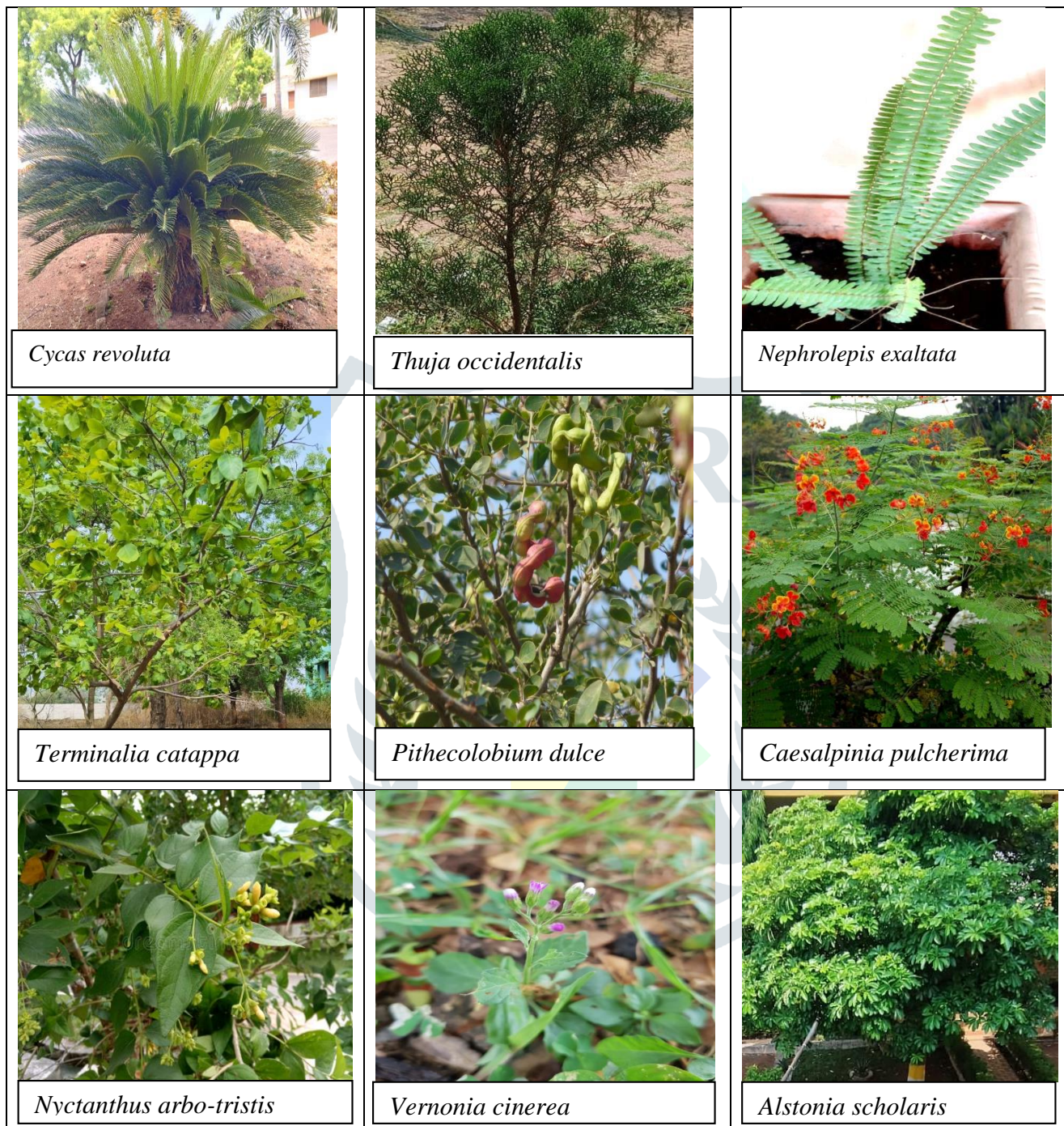


Figure 3: Plate showing images of biodiversity



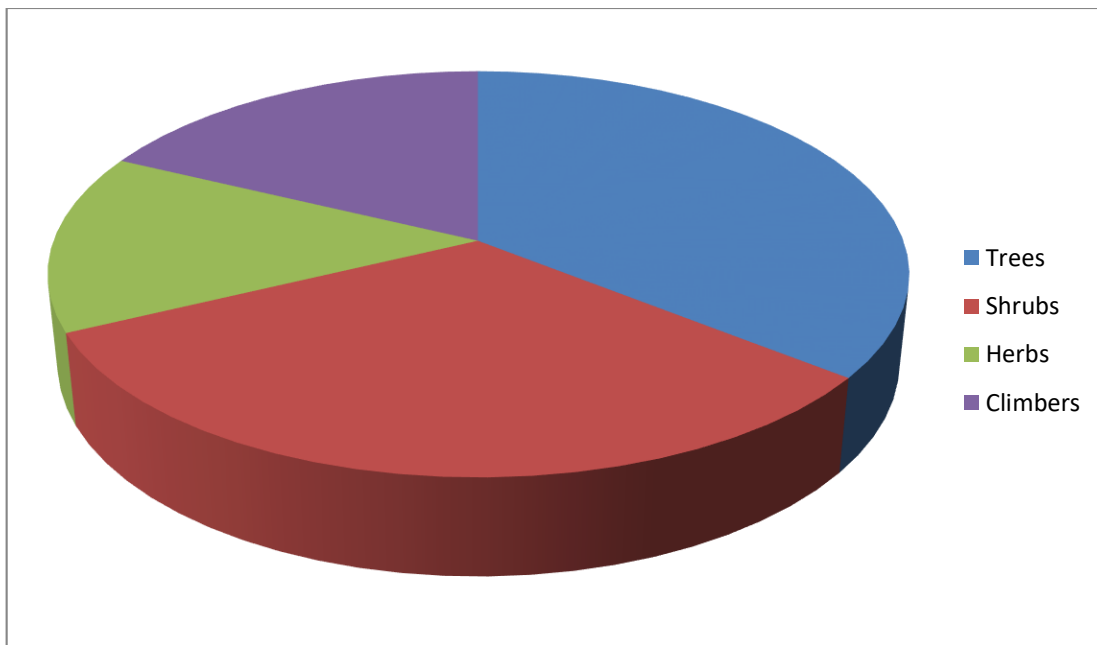


Figure 4: Analysis of habit-wise distribution of plant species in the campus

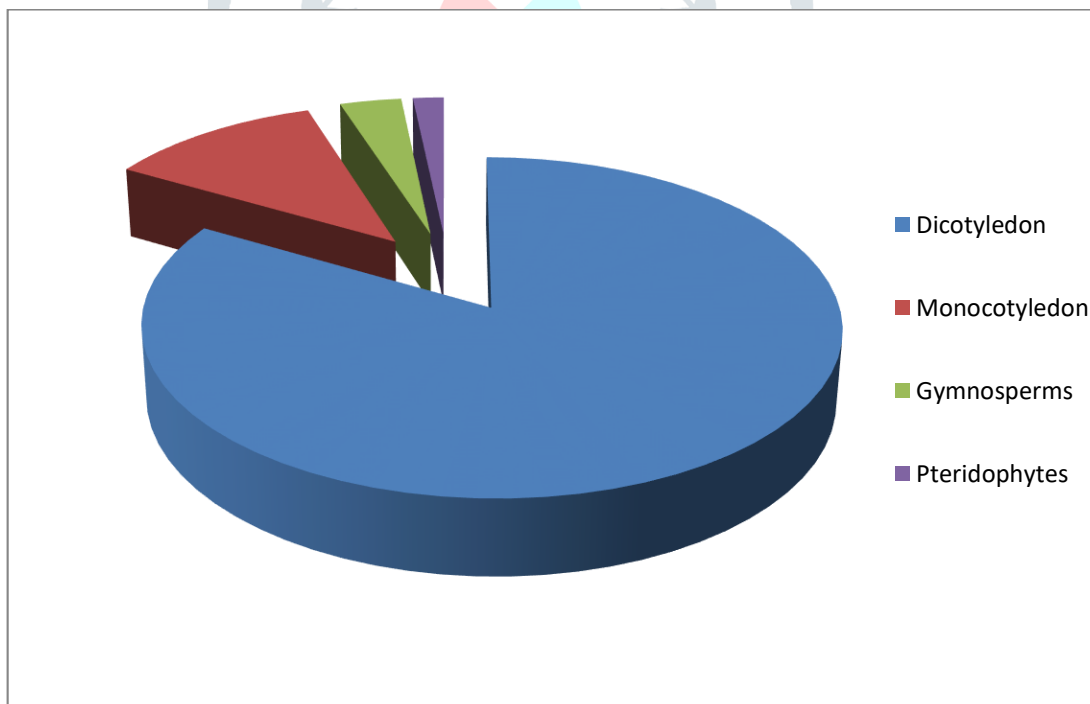


Figure 5: Analysis of group-wise distribution of plant species in the campus

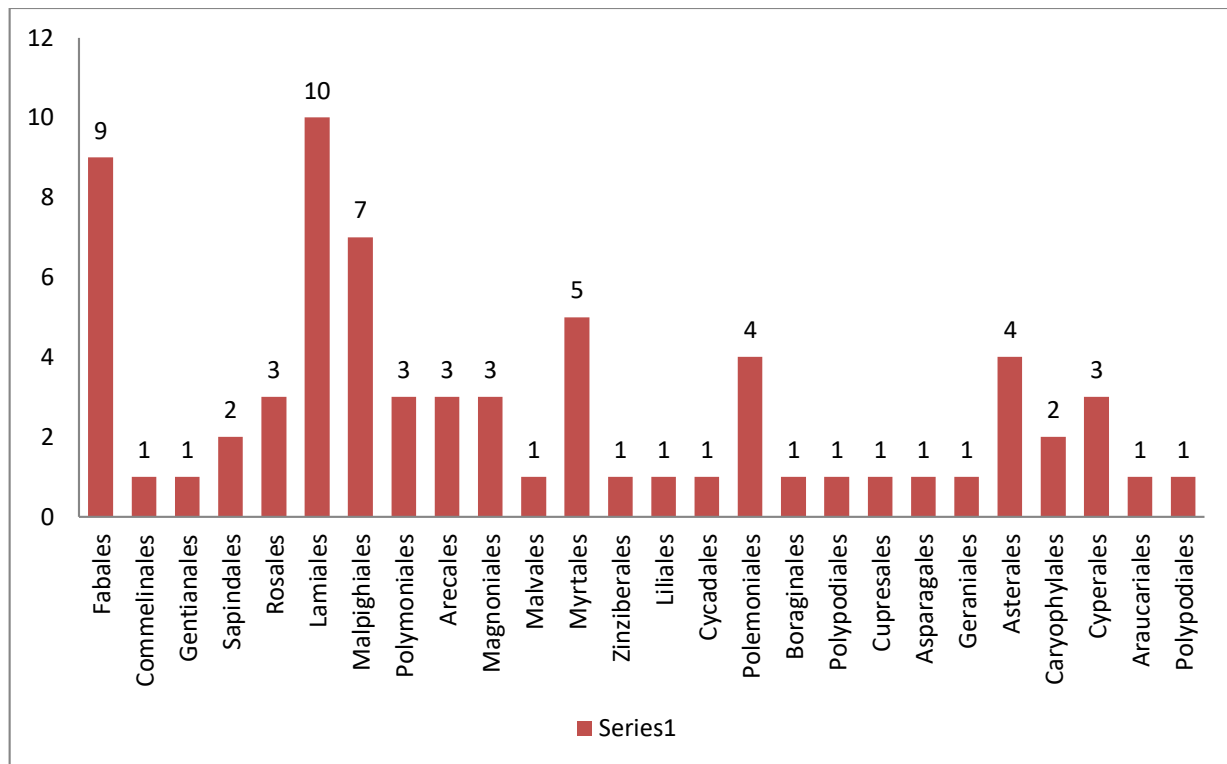


Figure 6: Order wise percentage composition of Flora recorded

## Result and Discussion

There are roughly 78 species in the angiosperm family, of which 71 are dicotyledons, 7 are monocotyledons, 3 are gymnosperms, and 1 is a pteridophyte. (Fig 5) Out of 38 families, maximum genus (9) are found in Apocynaceae family which is followed by Euphorbiaceae (7), Caesalpiniaceae (4), Papilionaceae (4), Oleaceae (4), Asteraceae (4) and Arecaceae (4). Trees and shrubs are more common than Herbs and climbers, according to habit study. (Figure 4). Every plant species identified throughout the investigation is part of 26 orders, which include 38 families. The maximum genera are shown by the Lamiales order, which is followed by the Asterales, Fabales, Myrtales, Malpighiales, and Polemoniales.

Many of the 82 kinds of plants are thought to be native to the area. *Cycas circinalis*, a gymnosperm, also can be considered as a native flora. Except for *Murrya exotica*, *Parthenium*, and *Alstonia scholaris*, dominant species like *Acalypha indica*, *Peltophorum pterocarpum*, *Azadirachta indica*, and *Polyalthia longifolia* can be regarded as native flora. The saplings planted on the edges of the college administration building, girls campus, knowledge resource center, and women's hostel have greatly contributed to the plant's dominance. Apocyanaceae is the predominant angiosperm family on campus.

## Conclusion

This study has provided valuable insights into the floral diversity present within the college campus environment. Through comprehensive surveys and taxonomic documentation, we have identified a diverse array of plant species spanning various taxonomic groups, including dicots, monocots, gymnosperms, and pteridophytes. Our findings reveal the richness and complexity of the campus flora, underscoring the importance of college campuses as reservoirs of biodiversity within urban landscapes.

Furthermore, the observed patterns of species distribution and abundance offer important implications for campus management and conservation practices. Understanding the ecological requirements and habitat preferences of these plant species is essential for informed decision-making regarding landscape design, habitat restoration efforts, and conservation initiatives. By recognizing and



preserving the unique floral assemblages found within college campuses, we can contribute to the enhancement of local biodiversity and the provision of ecosystem services.

Looking ahead, there are several avenues for future research and action. Long-term monitoring studies are needed to track changes in floral diversity over time and assess the impact of anthropogenic activities on campus ecosystems. Additionally, interdisciplinary collaborations involving botanists, ecologists, landscape architects, and campus stakeholders can facilitate the implementation of sustainable management strategies aimed at protecting and enhancing floral diversity.

In conclusion, our study underscores the importance of college campuses as living laboratories for biodiversity research and conservation. By fostering an appreciation for the natural world and integrating ecological principles into campus planning and management practices, we can work towards creating vibrant, resilient, and ecologically sustainable campus environments."

The above study showed that the campus is rich in biodiversity of plants. The above study showed that the above mentioned study site is rich in flora diversity and has various patches which are very dense in flora.

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