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A Study On The Woody Flora Diversity In College Campus

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ABSTRACT

This study aims to investigate the biodiversity within the campus of KM Mayawati Government Girls P.G. College, Badalpur, located in Gautam Buddha Nagar district, Uttar Pradesh. The college lies in the northern plains of India and represents a significant ecological zone within the region. The continuous survey was conducted, with the objective of cataloging all plant species present on the college grounds.

To carry out this survey, the line-transect method was employed, and observations were made throughout all seasons to ensure comprehensive coverage. A diverse array of shrub and trees, was recorded during the study. In total, 44 plant families encompassing 39 genera were identified across the campus. The selection of KM Mayawati Government Girls P.G. College for this biodiversity assessment was driven by the intent to promote conservation and ecological awareness. The findings underscore the importance of ongoing monitoring and preservation efforts to safeguard the rich biodiversity of the area.

Key words: Biodiversity, Woody flora, College, Campus, Monitoring, Survey.

India's natural wealth is legendary, teeming with biodiversity hotspots Biodiversity spans genes, species and whole ecosystems, and even the smallest organisms are essential for ecological stability. Safeguarding this richness underpins sustainable development and bolsters environmental resilience. While major conservation programs tend to spotlight economically valuable species, many inconspicuous, patchily distributed plant groups; especially in semi-urban settings like college campuses; still lack proper documentation. The biodiversity of terrestrial ecosystems plays a vital role in maintaining ecological balance and supporting life on Earth. Among these ecosystems, educational institutions such as college campuses represent unique ecological microcosms spaces where built infrastructure coexists with green zones that nurture a wide variety of plant life. The investigation of woody plant diversity in college and university campuses has garnered more attention as educational institutions are recognisedasSignificant urban green spaces that support biodiversity, provide ecological benefits, and offer outdoor research opportunity for Researchers have shown that many university campuses host surprisingly rich woody plant diversity. The main campus of Banaras Hindu University (BHU) in India was reported to contain 330 plant families(singh,2015), demonstrating that even urban campuses can maintain high levels of biodiversity. Mishra and Verma (2025) identified 73 woody species at Bundelkhand University, with Fabaceae trees being the most prevalent family, a pattern also seen in other campuses. Dash,Das,Acharya (2020) documented 118 woody species from 38 families at the quad campus

in Bhubaneswar, emphasizing the importance of systematic surveys for guiding sustainable conservation practices.

The campus inventory framework proposed by Cruise et al. (2015) highlights the significance of monitoring systems in supporting ecosystem services and improving campus well-being. More recent research by Silué et al. (2025) on the Peleforo Gon Coulibaly University campus in Côte d'Ivoire shows that green spaces on campus can harbor threatened or regionally important woody species, highlighting the importance of conservation-focused campus management.

Despite their prevalence and ecological potential, the floral diversity of college campuses remains under documented, especially in regions like Gautam Buddha Nagar, Uttar Pradesh.

This study aims to bridge that gap by conducting a comprehensive investigation into the plant diversity found within the campus of Km. Mayawati Government Girls P.G. College, Badalpur. The rationale for selecting this site is rooted in its ecological, educational, and community significance. College campuses often serve as reservoirs of native and introduced plant species, offering a rich tapestry of vegetation across gardens, courtyards, and open fields. Moreover, the interaction between human activity and natural growth within such spaces provides a valuable lens through which to examine anthropogenic impacts on plant communities.

KM Mayawati Government Girls P.G. College, located in Badalpur, is situated in the Gautam Buddha Nagar district of Uttar Pradesh, within the National Capital Region (NCR). The latitude and longitude of the college are approximately 28.591010°N and 77.518613°E. The region forms part of the northern Indo-Gangetic plains, characterized by alluvial soil, moderate elevation, and a blend of semi-arid and deciduous vegetation.

College was Established in 1997, the college is affiliated with Chaudhary Ciaran Singh University, Meerut. It holds a NAAC accreditation of Grade B++ with a score of 2.91. As a government institution, it primarily serves girls from rural and semi-urban communities, contributing to the educational upliftment of the region.

OBJECTIVES:

With this in mind, our study set out to catalog and classify every plant species found within the KM Mayawati College campus during the year 2024. The objectives of this research are threefold:

- **Taxonomic Survey**: To systematically identify and classify shrub, and tree species across diverse ecological zones within the campus.
- **Floristic Abundance Analysis**: To assess the relative abundance and dominance of specific plant families within the campus vegetation.
- **Conservation Significance Evaluation**: To determine the ecological roles and conservation value of identified plant species in promoting biodiversity, regulating microclimates, and enhancing ecosystem resilience.

METHADOLOGY:

To achieve this objective, conducted regular field surveys, GPS-tag and photograph each species, and identify plants with the assistance of experts, using the line-transect method, direct observation, or the relevant literature. In support of these aims, we have adopted a multi-method approach that integrates field surveys, botanical sampling, and comprehensive data analysis.

This research contributes to the broader fields of ecology, conservation biology, and sustainable landscape management. It also offers practical insights for campus administrators, urban planners, and educators, supporting informed decisions that promote ecological sustainability and environmental awareness within educational settings.

This college is recognized for its infrastructure and land scape. The Campus is predominantly covered with natural and cultivated vegetation. The climate of study area is healthy, fresh moderately cool because of vegetation covers in the campus. The maximum area of campus is covered by plants, herbs, shrubs and lawn which increase aesthetic value of college.

Study region is divided into 9 locations according to area of campus

Location 1	Main Garden
Location 2	Buddha Garden
Location 3	B.Ed. Garden from the Entrance side
Location 4	B.Ed. Garden from the College side
Location 5	B.Ed. Hostel
Location 6	Guava Garden
Location 7	Fish pond Garden
Location 8	Behind Canteen
Location 9	B.Voc. Garden

Table 1 -List of Plants with Botanical Names, Common Names, and Observations

Sn.	Botanical Name	Common Name	Observation/Data										
1	*Polyalthia longifolia*	False Aahoka	6	1		9	5		3	6			30
2	*Aegle marmelous*	Bael	1			1							2
3	*Azadirachta indica*	Neem	5			3					1		9
4	*Melia azedarach*	Pride of India				1							1
5	*Delonix regia*	Gulmohar	7			14	1						22
6	*Senna siamea*	Kassod								2			2
7	*Dalberjia sissoo*	Seasum	1				2			1			4
8	*Calliandra Haematocephala*	Pwder puff			2				2		1		5
9	*Pongamia pinnate*	Indian Beech tree			2					1			3
10	*Psidium guajava*	Guava	1					14					15
11	*Syzygium cumini*	Jamun	1										1
12	*Melaleuca bracteata*	Golden Bottle brush	2		1								3
13	*Terminalia arjuna*	**Arjun**						1					1
14	*Mangifera indica*	Mangoo tree					1						1
15	*Neolamarckia cadamba*	Kadam	9	6	2	6	1						24
16	*Hamelia patens*	firebrush			1				1				2

17	*Tabernaemontana divaricata*	Chandani	10							1			11
18	*Thevetia Peruviana*	Pili Kaner	1						1				2
19	*Plumeria rubra*	Champa			2	1			14		3		20
20	*Alstonia scholaris*	Blackboard tree								1			1
21	*Lantana camera*	Lantana					1			2			3
22	*Cordia dichotoma*	Boraginaceae								2			2
23	*Nyctanthes arbor-tristis*	Oleaceae			2								2
24	*Gymnanthemum longifolia*	Bitter leaf								1			1
25	*Hibiscus rosa-sinensis*	Gurhal			1					1			2
26	*Lawsonia inermi*	Mehandi/Heena					1						1
27	*Phyllanthus emblica*	Amla			2	1							3
28	*Jatropha corcas*	Jatropha	2										2
29	*Ficus racemosa*	Gular	1										1
30	*Ficus benghalensis*	Banyan				1							1
31	*Ficus benjamina*	Chinesh fig	18			8	9		25				60
32	*Ficus virens*	Pakar/peepli				1							1
33	*Ficus microcarpa*	weeping fig	13						1		3		17
34	*Ficus religiosa*	Peepal	1				2						3
35	*Holoptelea integrifolia*	Chilbil							1				1
36	*Grevilea robusta*	silver oak	1	1									2
37	*Moringa Oleifera*	Drumstick tree					2						2
38	*Bambusa ventricosa*	Budha Belly bamboo			3								3
39	*Roystonea regia*	Royal Palm	2	5	5						3		15
40	*Wodyetia bifucata*	Fox tail Palm					4		8				12
41	*Washingtonia filifera*	Maxican fan Palm	1		3	6	4		8				22
42	*Rhaphis excelsa*	Lady Palm		3	2								5
43	*Pinus roxburghii*	Long needle pine			3								3
44	*Araucaria heterophyllus*	Christmas tree		2	1								3

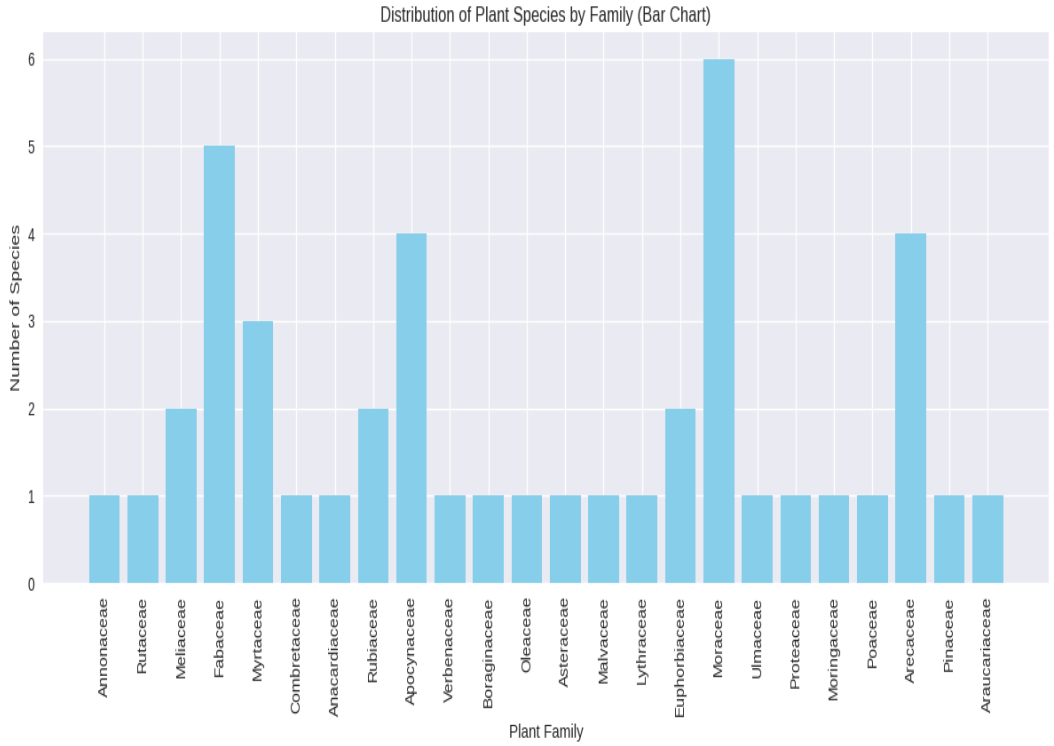
TABLE 2 -"Plant Names with Family ,Class and Habit"

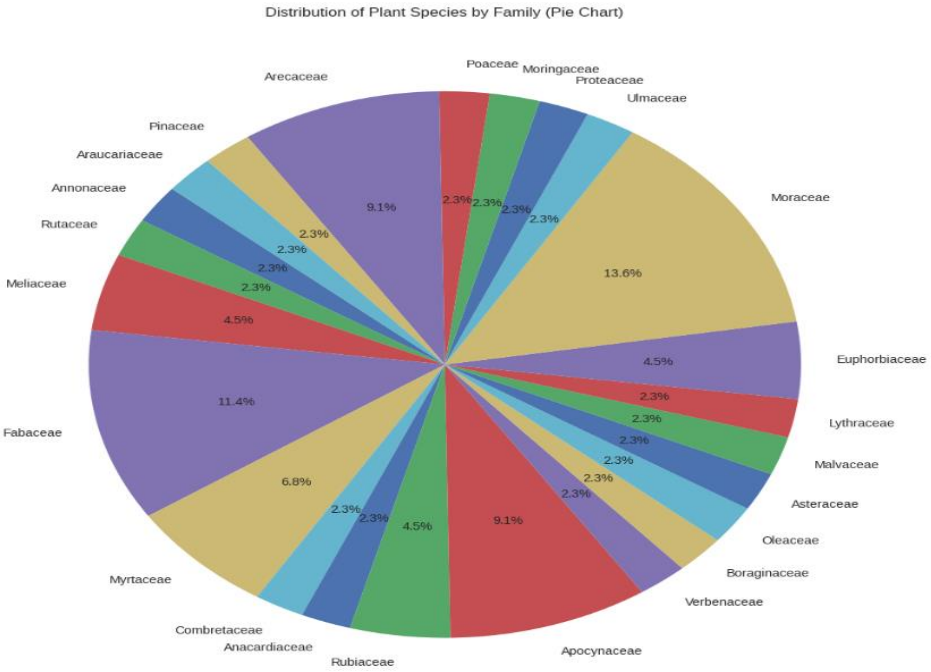
S.No.	*Name of the plant*	Family	Class	Habit
1	*Polyalthia longifolia*	Annonaceae	Dicotyledons	Tree
2	*Aegle marmelos*	Rutaceae	Dicotyledons	Tree
3	*Azadirachta indica*	Meliaceae	Dicotyledons	Tree
4	*Melia azedarach*	Meliaceae	Dicotyledons	Tree
5	*Delonix regia*	Fabaceae	Dicotyledons	Tree
6	*Senna siamea*	Fabaceae	Dicotyledons	Tree
7	*Dalbergia sissoo*	Fabaceae	Dicotyledons	Tree

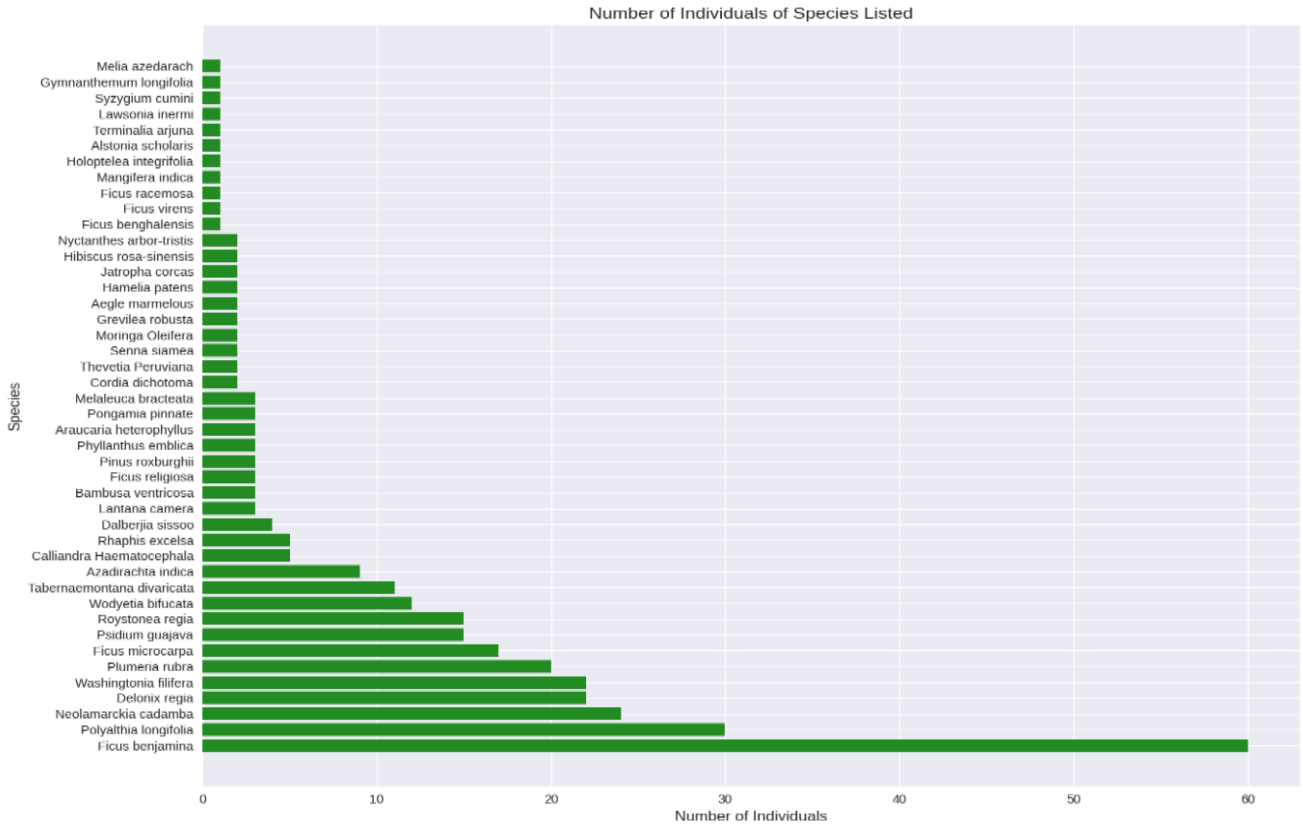
8	*Calliandra haematocephala*	Fabaceae	Dicotyledons	Tree /Shrub
9	*Pongamia pinnata*	Fabaceae	Dicotyledons	Tree
10	*Psidium guajava*	Myrtaceae	Dicotyledons	Tree
11	*Syzygium cumini*	Myrtaceae	Dicotyledons	Tree
12	*Melaleuca bracteata*	Myrtaceae	Dicotyledons	Tree/Shrub
13	*Terminalia arjuna*	Combretaceae	Dicotyledons	Tree
14	*Mangifera indica*	Anacardiaceae	Dicotyledons	Tree
15	*Neolamarckia cadamba*	Rubiaceae	Dicotyledons	Tree
16	*Hamelia patens*	Rubiaceae	Dicotyledons	Shrub
17	*Tabernaemontana divaricata*	Apocynaceae	Dicotyledons	Shrub/Tree
18	*Thevetia peruviana*	Apocynaceae	Dicotyledons	Shrub/Tree
19	*Plumeria rubra*	Apocynaceae	Dicotyledons	Shrub/Tree
20	*Alstonia scholaris*	Apocynaceae	Dicotyledons	Tree
21	*Lantana camera*	Verbenaceae	Dicotyledons	Shrub
22	*Cordia dichotoma*	Boraginaceae	Dicotyledons	Tree
23	*Nyctanthes arbor-tristis*	Oleaceae	Dicotyledons	Shrub/Tree
24	*Gymnanthemum amygdalinum* |	Asteraceae	Dicotyledons	Shrub
25	*Hibiscus –rosa-sinensis*	Malvaceae	Dicotyledons	Shrub
26	*Lawsonia inermis* |	Lythraceae	Dicotyledons	Shrub
27	*Phyllanthus emblica*	Euphorbiaceae	Dicotyledons	Tree
28	*Jatropha curcas*	Euphorbiaceae	Dicotyledons	Shrub/Tree
29	*Ficus racemosa*	Moraceae	Dicotyledons	Tree
30	*Ficus benghalensis**	Moraceae	Dicotyledons	Tree
31	*Ficus benjamina*	Moraceae	Dicotyledons	Tree
32	*Ficus virens**	Moraceae	Dicotyledons	Tree
33	*Ficus microcarpa*	Moraceae	Dicotyledons	Tree
34	*Ficus religiosa**	Moraceae	Dicotyledons	Tree
35	*Holoptelea integrifolia*	Ulmaceae	Dicotyledons	Tree
36	*Grevillea robusta*	Proteaceae	Dicotyledons	Tree
37	*Moringa oleifera*	Moringaceae	Dicotyledons	Tree
38	*Bambusa ventricosa*	Poaceae	Monocotyledons	Bamboo
39	*Roystonea regia*	Arecaceae	Monocotyledons	Palm
40	*Wodyetia biflora*	Arecaceae	Monocotyledons	Palm
41	*Washingtonia filifera*	Arecaceae	Monocotyledons	Palm
42	*Rhaphis excels*	Arecaceae	Monocotyledons	Palm
43	*Pinus roxburghii*	Pinaceae	Gymnosperms	Tree
44	*Araucaria heterophylla*	Araucariaceae	Gymnosperms	Shrub

Beauty of some trees and shrubs in our RSEULT AND DISCUSSION

The diverse collection of plant species you've listed spans across dicotyledons, monocotyledons, and gymnosperms, reflecting a rich botanical tapestry with significant ecological, economic, and medicinal value. Dicotyledons dominate the list, comprising 44 species across 25 families. Notably, the Moraceae family (including various *Ficus* species) plays a vital ecological role by supporting biodiversity through fruit production and canopy cover, while also offering cultural and religious significance in many regions. The Apocynaceae family, with species like *Plumeria rubra* and *Alstonia scholaris*, contributes not only to ornamental landscaping but also to traditional medicine—*Alstonia*, for instance, is used in treating respiratory ailments.


Distribution of Plant Species by Family (Bar Chart)
Number of Species
Plant Family
0
1
2
3
4
5
6
Annonaceae
Rutaceae
Meliaceae
Fabaceae
Myrtaceae
Combretaceae
Anacardiaceae
Rubiaceae
Apocynaceae
Verbenaceae
Boraginaceae
Oleaceae
Asteraceae
Malvaceae
Lythraceae
Euphorbiaceae
Moraceae
Ulmaceae
Proteaceae
Moringaceae
Poaceae
Arecaceae
Pinaceae
Araucariaceae


Distribution of Plant Species by Family (Pie Chart)
Arecaceae
Poaceae
Moringaceae
Proteaceae
Ulmaceae
Moraceae
Euphorbiaceae
Lythraceae
Malvaceae
Asteraceae
Oleaceae
Boraginaceae
Verbenaceae
Apocynaceae
Rubiaceae
Anacardiaceae
Combretaceae
Myrtaceae
Fabaceae
Meliaceae
Rutaceae
Annonaceae
Araucariaceae
Pinaceae
9.1%
2.3%
2.3%
2.3%
2.3%
13.6%
4.5%
2.3%
2.3%
2.3%
2.3%
2.3%
2.3%
9.1%
4.5%
2.3%
2.3%
6.8%
11.4%
4.5%
2.3%
2.3%
2.3%
2.3%
2.3%
2.3%



RESULT:

Economically, several species stand out. *Mangifera indica* (mango), *Psidium guajava* (guava), and *Syzygium cumini* (jamun) are major fruit crops in tropical regions, supporting local economies and providing nutritional value. Timber-yielding trees like *Dalbergia sissoo* and *Terminalia arjuna* are prized for their durable wood, used in furniture and construction. *Azadirachta indica* (neem) is a cornerstone of sustainable agriculture and natural pest control, with its oil and extracts widely used in organic farming and cosmetics. Similarly, *Moringa oleifera* is hailed as a "miracle tree" for its nutrient-rich leaves and seeds, offering both food security and medicinal benefits.

From an environmental perspective, many of these trees such as *Ficus benghalensis*, *Neolamarckia cadamba*, and *Grevillea robusta* are excellent for urban greening, erosion control, and carbon sequestration. Bamboo (*Bambusa ventricosa*) and palms like *Roystonea regia* and *Washingtonia filifera* enhance landscape aesthetics while contributing to microclimate regulation. The inclusion of gymnosperms like *Pinus roxburghii* and *Araucaria heterophylla* adds to the ecological diversity, especially in mountainous and temperate zones where they stabilize soil and support forest ecosystems.

Medicinally, this list is a treasure trove. *Aegle marmelos* is revered in Ayurveda for digestive health, *Phyllanthus emblica* (amla) is a potent antioxidant, and *Thevetia peruviana*, though toxic, is studied for its cardiac glycosides. Shrubs like *Lawsonia inermis* (henna) and *Jatropha curcas* have traditional uses ranging from dye production to biofuel. Even ornamental species like *Calliandra haematocephala* and *Hamelia patens* attract pollinators, supporting ecological balance.

Altogether, this plant assemblage not only enriches biodiversity but also underpins livelihoods, traditional knowledge systems, and environmental resilience.

CONCLUSION :

The plant species provided can be categorized into three major botanical groups: dicotyledons, monocotyledons, and gymnosperms. The majority belong to the dicotyledons group, comprising 38 species spread across 20 families. Among these, the Moraceae family is the most represented with six tree species, including various Ficus types. The Apocynaceae family follows with five species that range from shrubs to trees. Other notable dicot families include Fabaceae, Myrtaceae, Rubiaceae, Meliaceae, Caesalpiniaceae, and Euphorbiaceae, each contributing two or more species. The remaining dicot families—such as Annonaceae, Asteraceae, Ulmaceae, Anacardiaceae, Combretaceae, Moringaceae, Lythraceae, Rutaceae, Boraginaceae, Oleaceae, and Proteaceae—each contribute a single species, showcasing a rich diversity of trees and shrubs.

In contrast, the monocotyledons group includes four species from two families. The Arecaceae family contributes three palm species, while the Poaceae family is represented by a single bamboo species, Bambusa ventricosa. Lastly, the gymnosperms are represented by *Pinus* from the Pinaceae family and *Araucaria* from the Araucariaceae family, thereby adding coniferous trees to the mix.". This classification highlights the dominance of dicotyledonous trees and shrubs in the list, with a modest representation of monocots and gymnosperms, reflecting a broad spectrum of botanical diversity.

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