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Diversity of Plant and Animal Species at the Campus of Shri Krishna University, Chhatarpur, Madhya Pradesh, India

Radha Rajpoot^a, Assistant Professor (Botany) Manisha Nahar^{b*} Assistant Professor (Zoology) Shri Krishna University, Chhatarpur (M.P.)

ABSTRACT

Shri Krishna University's campus in Chhatarpur, Madhya Pradesh, offers unique opportunities for exploring the rich biodiversity of the region because it is home to a wide range of plants and animals. The study evaluates and catalogs the plant and animal life present on the university's campus, emphasizing the ecological importance of medicinal plants, ornamental species, timber plants, and fruit-bearing plants. Field surveys were conducted over a period of two months, during which both flora and fauna were systematically cataloged. A total of 64 plant species and 30 animal species were identified, representing a wide range of local and migratory species. The plant diversity included species from various ecological groups such as trees, shrubs, herbs, and grasses, while the animal species observed included a variety of birds, mammals, reptiles, insects, and invertebrates, highlighting the rich biodiversity within the campus ecosystem. A total of 64 plant species have been identified, including 42 medicinal plants known for their therapeutic properties, 13 ornamental plants prized for their aesthetic value, 7 timber species with both economic and ecological significance, and 10 fruit-bearing plants that play a key role in local food security. Additionally, the study examined the distribution of plants and animals on the campus and their relationship to different habitat types. The findings emphasize the vital role of the campus as a repository of both useful and ornamental plants, as well as a haven for local wildlife. In addition, the research emphasizes the need for sustainable management practices in order to protect biodiversity and ensure the survival of these species in the midst of urban development. This research contributes valuable data on the local flora and fauna, which can be utilized for conservation efforts and environmental education within the university campus.

KEYWORDS

Plant, Animal, Conservation, Biodiversity, Shri Krishna University

INTRODUCTION

Conservationist Raymond F. Dasmann coined the term biological diversity in 1968, stressing the need to protect species within ecosystems (Dasmann, 1968). This concept has evolved in scientific literature, with Wilson (1992) defining biodiversity as "All hereditarily based variation

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at all levels of organization, from genes within a single population to the species composing part of a local community, and finally to the communities themselves that make up the ecosystems of the world". In practical terms, biodiversity is often measured by the "Number of species," with a species being defined as a group of organisms capable of interbreeding under natural conditions (Wilson, 1992).

Biodiversity plays a crucial role in ecosystem dynamics and ecological functions, supporting vital services that sustain life on Earth (Husain et al., 2024; Quijas & Balvanera, 2013). Biodiversity encompasses the wide variety of life forms on Earth, including plants, animals, and microorganisms across terrestrial, aquatic, and marine environments. It is often measured through species richness, with species serving as the primary metric for assessing biological diversity (Mace et al., 2012). Species are found in a broad range of landscapes, from dense forests to farmlands, urban areas, and beyond. Forest ecosystems, in particular, tend to support a higher number of species compared to more human-dominated environments (Sharma et al., 2023). Diverse ecosystems and ecological zones also yield diverse species, each reflecting the unique conditions of its habitat, and they serve as vital natural resources for both present and future generations, providing essential benefits (Kim et al., 2024). Many rural communities depend on these biological resources for their livelihoods. The cultural, aesthetic, and recreational importance of biodiversity is immense, and cannot be easily measured in monetary terms. As such, understanding biodiversity is crucial for ensuring the survival and well-being of future generations. As a result of many plants and animals in our surroundings, the nutrient and water cycles are maintained and ecosystem services are provided that support the

food chain (Quijas & Balvanera, 2013). While they are vital to maintaining ecosystem balance, we often ignore or overlook their importance. It is vital to recognize the value of all biological species equally. Additionally, understanding and protecting the biological

Table 1	Information of study area
Name of the Place	Shri Krishna University
Taluk	Chhatarpur
District	Chhatarpur
State	Madhya Pradesh
Geographical Location	24.8372° N , 79.5214° E
Altitude	334 m
Habitat & Topography	Semi-urban; Plain topography

resources around us has become increasingly important, especially in light of the growing issue of biopiracy worldwide (Wynberg, 2023). It has become increasingly apparent that humans may pose a serious threat to biodiversity, particularly in tropical ecosystems, where factors such as seasonal rainfall and natural disturbances greatly affect species richness (Bhuyan et al., 2003; Wang et al., 2024). In this context, understanding and preserving local biodiversity becomes critical. In India, traditional practices, beliefs, and customs have historically contributed to the conservation of habitats and species, particularly in the relation to medicinal plants (Anju & Kumar, 2024)

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Furthermore, the preservation of large trees, including dead trees, plays a vital role in sustaining biodiversity by providing habitats and sequestering carbon. Among India's largest states, Madhya Pradesh is home to a diverse flora and fauna that contributes greatly to its economic and biogeographic significance (www.mpforest.gov.in/ LU_MP_Report120417). The present investigation aims to explore the flora and fauna of University Campus, highlighting the biogeographical and socioeconomic significance of the campus's vegetation and fauna species. This research intends to emphasize the importance of local plant life in maintaining broader ecological diversity and its potential role in advancing conservation and sustainable management practices for animal species.

STUDY AREA

The Shri Krishna University is a private university, situated in the village of Chauka, Chhatarpur, Madhya Pradesh-India. It was established in 2018 and situated at 24.837°N 79.522°E longitude, located on National Highway 86 (NH-86) along Sagar Road. From the name "Krishna" emerges the idea of the "blackness" from which manifestations of the Universe and Divinity can be perceived. In addition to absorbing the energy of light, "Krishna" represents cosmic consciousness. It was the belief of the founder members that Lord Shri Krishna was always present.

Their lives have always been enriched by Sri Krishna's support during difficult periods. Lord Krishna (<u>https://www.skuindia.ac.in/history university</u>) who always provided his hidden support as if saying "Carry on your good deeds and you will surely win". Having such a strong spiritual connection with Lord Shri Krishna led us to name our proposed university "Shri Krishna University.

It is a state private university whose accreditation has been granted by the UGC, Government of MP, Private University Regulatory Commission, NCTE, PCI, INC, BCI, etc. It is situated at NH-86 Sagar Road Chhatarpur, Madhya Pradesh, far from the dense and pollution-filled city of the city. The area is accessible from all parts of India with its close proximity to Chhatarpur and well-connected to all modes of transportation (https://www.skuindia.ac.in/history-university).

Its academic accomplishments, facilities, and financial resources, the university enjoys a significant position and a strong reputation among higher education institutions not only in Madhya Pradesh but also in MP border near other North India states like-Uttar Pradesh.

The University's campus is made up of 24,281 square meters of land space. Total 5000 square meters area is covered with greenery formed gardens which is approximately 20% of the campus.

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2000 square meters area of the campus is used as playground and reaming 5740 sq. meters area is used for miscellaneous purposes.

Shri Krishna University campus is a biggest co-eds private university of Chhatarpur,

Madhya Pradesh about more than 5000 students are study in different departments like that Education, Science, Commerce, Journalism and Mass Communication, Management, Computer Science & Application, Agriculture, Humanities & Social Science, Fashion and Animation, Engineering & Technology, Vocational Disaster Studies, Paramedical, management, Law. Music. Dance. Pharmacy, Nursing, Fine Arts & Film and Theater.

University's The campus is rich in flora and sprawling over 13 fauna. hectares with mostly green including different areas gardens: Dom area's garden, A-block garden, **B**-block gardens and C-block garden which consists of some old trees along with shrubs, herbs and tree.



Figure 1-*Map showing the location of the Shri Krishna University
campus (Source: Google Earth Maps;
https://www.google.com/maps/@24.8372356,79.5188286,685m/data &
https://cache.careers360.mobi/media/colleges/staticmap/2024/2/16/253
99.png).

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Figure 2- *Layout and Infrastructure of Shri Krishna University campus (Source: https://www.skuindia.ac.in/university-layout and https://www.skuindia.ac.in/our-vision#slide1)

MATERIALS AND METHODS

This study does not aim to document all forms of life on the Shri Krishna University campus, but rather focuses on identifying key groups of plants and animals. The approach for this documentation follows guidelines from the Indian Biodiversity Portal and the Madhya Pradesh Flora (https://bsi.gov.in/page/en/state-flora). Initial identification of flora and fauna was carried out through direct observation. Identifying plants was cross-checked with the Botany Department help, and relevant literature was consulted from flora of Madhya Pradesh and Indian biodiversity-portal (https://indiabiodiversity.org).

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Where as, the identification of animals were supported by consulting relevant literature, online resources, and guidance from faculty members. This methodology allows for an organized and practical approach to documenting the flora and fauna of the campus, highlighting the different species and their ecological roles. Preliminary identification of plants was carried out by students, faculties, and non-teaching staff, with confirmation of their identities provided by the

Department. Botany For faunal diversity, references from literature, websites, and guidance from teachers & non-teaching were utilized. All species documentation is based on visual observations only. The focus was solely on recording the names of occurred species, without quantifying their numbers. Plants were categorized into four main groups based on their uses: ornamentals, timber, fruitbearing, and medicinal plants. Animals were classified into broad groups such as mammals, birds, reptiles, and insects. A thorough plant survey was conducted through direct observation of plants growing naturally in the university to ensure accurate data. The plant samples collected were then identified at the herbarium of the Department of Botany. The survey involved systematically walking through various campus habitats, including gardens, wooded areas, and natural fields in the university. During these walks, all plant species encountered were recorded, with



Figure 3 - Identification of plant and animal species through direct observation with faculties and students.



details such as species names, abundance, flowering times, and notable features. Key plant characteristics like leaf shape, flower structure, color, and arrangement were carefully observed. To aid in identification, a comprehensive guidebook or mobile app for local flora and fauna was used.

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RESULT AND DISCUSSION

1. Plant Diversity

A total of 64 plant species have been identified on the Shri Krishna University campus, classified into medicinal, ornamental, timber, and fruit plants.

In which among the 8 species of plants, *Acacia nilotica*, *Bombax ceiba*, *Butea monosperma*, *Cassia fistula*, *Dalbergia sissoo*, *Holoptelea integrifolia* belong to the medicinal and timber plant groups, whereas *Emblica officinalis*, *Aegle marmelos* are part of the medicinal and fruit plant groups. Where possible, local names and the locations of these species on the campus have been recorded.



An inventory of these species is provided separately under each respective category.

1.1 Medicinal plants

The Shri Krishna University campus hosts 42 species of traditionally curative plants. Information on the plant parts utilized and their therapeutic applications has been documented through a field survey. These plants are help in the treatment of a wide range of ailments.

Table 2-Medicinal plants of the University campus

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S.	Local name	Scientific name	Location	Plant's
No.				part used
1	Indian	Emblica officinalis Gaertn.	Entrance gate garden	Extract
	gooseberry, Amla		(Boundary wall)	
2	Flamboyant,	Delonix regia (Hook.) Raf.	Entrance gate garden	Flower,
	Gulmohar		(Boundary wall)	leaf, bark, Pod
3	Indian Elm	Holoptelea integrifolia (Roxb.) Planch.	Entrance gate garden	Leaf, bark
4	Kadamba	Anthocephalus cadamba (Roxb.) Miq.	Boundary wall A-B block	Bark, leaf
5	Chirchitta, Prickly Chaff flower	Achyranthes aspera Linn.	Entrance gate garden	Leaf, root, seed
6	Moringa	Moringa oleifera Lam.	Entrance gate garden (Boundary wall)	Pod, leaf, flower
7	Kachnar, mountain ebony	Bauhinia variegata L.	Boundary wall B block	Bark, leaf, flower
8	Christmas Tree	<i>Araucaria columnaris</i> (J.R. Forst.) Hook.	Entrance gate garden	Leaf
9	Shisham	Dalbergia sissoo Roxb. ex Dc.	Entrance gate garden	Leaf, bark, pod
10	Neem	Azadirachta indica A. Juss.	B block garden area	Whole plant
11	Babool, Kikar	Acacia nilotica (L.) Del. ssp. Indica (Benth.) Brenan	Entrance gate garden	Whole plant
12	White siris	Albizia procera (Roxb.) Benth.	Entrance gate garden	Bark, pod
13	Kankair	Flacourtia indica (Burm. F.) Merr.	B block (Field area)	Leaf, bark, fruit, root
14	Cahuato, Tecoma	<i>Tecoma fulva</i> (Cav.) G. Don	A block (Infront of Law department)	Leaf, flower

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15	Weeping Fig	<i>Ficus benjamina</i> L.	All campus garden area	Bark, leaf, root, fruit, stem
16	Natural healer, Miracle plant	Aloe vera (L.) Burm. f.	B block (Room no. 24)	Leaf, gel
17	Paper flower	Bougainvillea spectabilis Willd.	Boundary wall A-B block	Leaf, bract, stem
18	Devil's tree, Milkwood pine	Alstonia scholaris (L.) R. Br.	Entrance gate garden (Boundary wall)	Bark
19	Kantakari, Yellow Berried Nightshade	Solanum xanthocarpum Schrad. & J.C. Wendl.	B block garden area	Leaf, root, stem, flower, fruit
20	Amaltas, Golden shower	Cassia fistula L. शोध संचार	Entrance gate garden	Bark, root, leaf, flower, fruit
21	Bael	Aegle marmelos (L.) Correa	A block (Behind HR office building)	Leaf, bark, root, fruit, seed
22	Red Silk cotton tree	Bombax ceiba L.	B block garden area	Leaf, flower, root, stem bark, gum, fruit
23	Blue morning glory	Ipomea indica (J.Burman) Merr.	Entrance gate garden	Seeds, leaves, roots
24	Nutgras	Cyperus rotundus L.	B block garden area	Rhizome, tuber
25	Australian asthma herb	Euphorbia hirta L.	B block entrance	Leaf, stem, roots

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26	Gale of the wind	Phyllanthus niruri L.	A block (Infront of Law department)	Leaf, root
27	Coatbuttons	Tridex procumbens L.	B block garden area	Leaf, stem, roots, flower
28	Creeping woodsorrel	Oxalis corniculata L.	B block garden area	Stem, bark, leaves, flower
29	Bermuda grass	Cyanadon dactylon (L.) Pers.	B block garden area	Root stalk
30	Tulsi	Ocimum sanctum L.	Boundary wall B block, Dome area (Entrance Garden)	Leaf juice
31	Jangali Tulsi	Ocimum basilicum L.	A block (Behind HR office building)	Leaf, seed, essential oil
32	Ram Tulsi	Ocimum gratissimum L.	Entrance gate garden	Leaf, flower
33	Jungali Chaulayi	Amaranthus viridis L.	B block entrance	Leaf
34	Palash 🚬	<i>Butea monosperma</i> (Lam.) Taub.	Entrance gate garden	Flower, leaf, bark, seed, gum, fruit
35	Peepal	Ficus religiosa L.	Near Boundary wall B block	Leaf, bark, fruit, root, seed, latex
36	Gurhal, Jasun	<i>Hibiscus rosa sinensis</i> L.	Entrance gate garden	Leaf, flower, root, bark
37	Ashoka tree	Polyalthia longifolia (Sonn.) Thwaites	B block garden area	Leaf, bark, root, stem, seed

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38	Congress grass	Parthenium hysterophorus L.	Entrance gate garden	Leaf,
				flower,
				stem
39	Mudar, Aak	Calotropis procera (Aiton) W. T.	A block (Infront of	Leaf, root,
		Aiton	Law department)	root bark,
				flower,
				latex
40	Life plant	Bryophyllum pinnatum (Lam.)	A block (Behind HR	Leaf, stem
		Oken	office building)	
41	Gorakh Ganga	Aerva lanata (L) Juss. Ex Schult.	B block garden area	Leaf, stem,
				flower,
				root
42	Bridal bouquet	Plumeria pudica Jacq.	A block (Infront of	Leaf and
			Law department)	root bark
		and the second se		

1.2 Ornamental Plants

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There are 13 plant species reported for their ornamental qualities in the campus. These species are primarily cultivated as garden plants or used for landscaping along avenues.

1 N.

Table 3	Table 3-Ornamental plants of the University campus			
S. No.	Local name	Scientific name	Location	
1	Spider Plant	Chlorohytum comosum (Thunb.) Jacques	Law deartment (entrance area)	
2	Agave	Agave americana L.	Dome area (Entrance Garden)	
3	Gulab	<i>Rosa indica</i> L.	A block garden	
4	Devil's backbone	Pedilanthus tithymaloides (L.) Poit.	Entrance gate garden	
5	Golden dewdrop	Duranta repens L.	A block (Behind HR office building)	
6	Champak	Michelia champaca L.	A block (Behind HR office building)	

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7	Sago palm	<i>Cycas revoluta</i> Thunb.	Dome area (Entrance Garden)
8	Bengali babul	Acacia auriculiformis Benth.	Entrance gate garden
9	Poinsettia, Winter rose	Euphorbia pulcharima Willd. ex Klotzsch	Dome area (Entrance Garden)
10	Genda	Tagetes erecta L.	B block garden area
11	Areca palm	<i>Dypsis lutescens (H.Wendl.)</i> Beentje & J. Dransf.	B block garden area
12	Lantana, Shrub verbena	Lantana camara L.	Entrance gate garden
13	Sessile joyweed	Alternanthera sessilis (L.) R. Br. Ex DC.	Dome area (Entrance Garden)

1.3 Fruit Plants

There are 10 species of fruit plants in the campus. Some of them are economically important such as *Madhuca longifolia* (L.) J.F. Macbr., *Diospyros melanoxylon* Roxb., *Mangifera indica* L., *Emblica officinalis* Gaertn.

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Table 4-	Table 4-Fruit plants of the University campus			
S. No.	Local name	Scientific name	Location	
1	Sitaphal	Anona squamosa L.	A block (Infront of Law department)	
2	Mahua	Madhuca longifolia (L.) J.F. Macbr.	Near Boundary wall B block	
3	Tendu	Diospyros melanoxylon Roxb.	Entrance gate garden	
4	Karonda	Carissa carandas L.	Entrance gate garden	
5	Bael	Aegle marmelos (L.) Correa	A block (Behind HR office building)	
6	Jamun	Syzygium cumini (L.) Skeels	Entrance gate garden (Boundary wall)	
7	Aam	Mangifera indica L.	Entrance gate garden (Boundary	

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			wall)	
8	Amrood	Psidium guajava L.	Entrance gate garden	
9	Anar	Punica granatum L.	Entrance gate garden	
10	Indian gooseberry, Amla	Emblica officinalis Gaertn.	Entrance gate garden (Boundary wall)	

1.4 Timber plants

7-species of timber plants yielding species have been recorded. Avenue trees like *Thuja occidentalis* L. and *Dalbergia sissoo* Roxb. ex Dc. are planted on the front side of the campus for beautification.

Table :	Table 5-Timber plants of the University campus			
S.	Local name	Scientific names K U	Location	
No.				
1	Mor-pankhi	Thuja occidentalis L.	A block (Behind HR office building)	
2	Indian Elm	Holoptelea integrifolia (Roxb.) Planch.	Entrance gate garden	
3	Shisham 5	Dalbergia sissoo Roxb. ex Dc.	Entrance gate garden	
4	Babool, Kikar	Acacia nilotica (L.) Del. ssp. Indica (Benth.) Brenan	Entrance gate garden	
5	Amaltas, Golden shower	Cassia fistula L.	Entrance gate garden	
6	Palash, Dhak	Butea monosperma (Lam.) Taub.	Boundary wall B block (vicinity)	
7	Red Silk cotton tree	Bombax ceiba L.	B block garden area	

2. Animal Diversity

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Around 35 species were observed and documented across four main categories: mammals, birds, reptiles, and insects. The scientific names of the animals could not be determined, so identification was based on their common names. Information regarding their location and abundance has also been included.

2.1 Vertebrate animals

i. Mammals: A total of 6 mammal species were recorded on the campus, including squirrels, rats, dogs, cats, cows, Animal species representation Across Major Groups

Figure 5 - Numbers of Animal groups encountered in the university campus.

and monkeys. The first five species were commonly seen, while the monkey was an occasional visitor.

- Birds: Seven bird species were observed in various areas of the campus. Most of them were resident species, frequently spotted throughout the campus. The Rock Dove (Rock Pigeon), House Sparrow, Common Myna (Galgalia), Koel, Parrot, Crow, and Jungle Babbler were all noted, with the latter being the only migratory species, typically observed during October and November when fruits are plentiful in the forest.
- iii. **Reptile:** Reptile diversity on the campus was relatively low, with only a few species recorded, including snakes, house lizards, Indian Monitors, and Giragiton. These reptiles are primarily observed during the summer months.
- iv. **Insects:** Insects represent the largest group of vertebrate animals observed on the campus. A variety of insect species were recorded, though due to the lack of a taxonomic expert, only their common names have been listed. Many of these insects are commonly seen year-round, while others, such as Cicadas, are seasonal and typically observed in October and November.

2.2 Invertebrate animals

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i. Arthropoda: Millipedes and centipedes were recorded on the campus between September and November. Ants and cockroaches, common household pests, were also found in the university campus, thriving in human-dominated habitats.

CONCLUSION

Biodiversity provides invaluable environmental services through its species, which are vital at worldwide, country wise and local levels. However, in contrast, mega-diverse nations have often developed technologies that exploit species, leading to the destruction of biodiversity-a trend that India is capable of following.

The present study focused on the flora and fauna of Shri Krishna University, Chhatarpur, Madhya Pradesh conducted from September to December 2024. In conclusion, the diverse array of vertebrate and invertebrate species observed on the campus reflects the rich biodiversity present within the ecosystem. The variety of mammals, birds, reptiles, and insects, along with invertebrates such as arthropods, underscores the importance of maintaining a balanced and healthy environment. A total of 64 species were observed, including herbs (14.72%), shrubs (4.48%), liana (0.64%), and trees (21.12%).

Among these, shrubs and trees were the most abundant. Tree species observed included Ashok, Neem, Peepal, Sheesham tree, Bargad tree, and others. The university campus rich in the plants diversity, remains evergreen, and serves as A clean air zone (AQIC). Preserving this biodiversity is essential not only for the ecological well-being of the campus but also for fostering a deeper understanding of the interdependence of species. Continued monitoring and conservation efforts will be crucial in ensuring that these species thrive and contribute to the long-term ecological health of the area. India's biodiversity offers critical lessons in resilience and coexistence, which are necessary for the future of our planet. Continued efforts and policy initiatives are necessary to ensure the lasting legacy of India's diverse flora and fauna.

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