

Enumeration of tree species in Guru Ghasidas Vishwavidyalaya Campus, Koni-Bilaspur, Chhattisgarh

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ABSTRACT

Present study is focused on the tree species found in the Guru Ghasidas Vishwavidyalaya campus in Koni-Bilaspur, Chhattisgarh. With the purpose of documenting the tree species, a site visit was conducted in the month of January 2022 to June 2023. This survey was restricted over the nearby regions of Department of Botany, School of Life Science and partially over the entire campus area. The flowering and fruiting season of random visible trees were recorded and identified by using standard flora and Plants of the World Online (POWO). The aim was to identify and document the tree species for further investigation the diversity in Vishwavidyalaya campus, which was managed by various departments i.e., Botany, Forestry, Rural-Technology, Administrative department etc. A total of 34 tree species of belonging to 32 genera and 15 families were recorded. Fabaceae was noted as most dominant family in the campus. Two species, viz. *Butea monosperma* (Lam.) Kuntze and *Dalbergia sissoo* Roxb. ex DC. were most widely spread across the campus.

Keywords: Trees, Guru Ghasidas Vishwavidyalaya, Fabaceae, *Butea monosperma*, *Dalbergia sissoo*

INTRODUCTION

Trees are the one of the most important species which provides shelter to almost every species be it human or insect and also helps in shaping the landscapes and enhancing its beauty. They provide a number of ecosystem services such as conservation of water, species, soil erosion, and habitat for living of other species (Connell, 1971). Trees are the necessary sources of fruits, timber, medicines, spices, condiments, fodder, fuel, essential oils, fumigators and masticatories, sugar, starches, paper and pulp, fibers, tannins and dyes (Seth, 2004; Armenteras, *et al.* 2009). Tree species diversity functions as an important aspect in shaping any region or landscape and defines the type of ecosystem of that region (Rennolls and Laumonier, 2000; Tchouto, *et al.* 2006). Diversity of trees influences the climate of the region, species composition, and geomorphology and is an important element of biodiversity (Ozcelik, 2009). The country's most pure and rich collection of natural resources is awarded to the Chhattisgarh, which is also declared "Herbal State" by the government in 2001. 59,772 km² or 44.21% of the state's total land is recorded as forest (FSI report 2021).

Guru Ghasidas Vishwavidyalaya is a central university located in Bilaspur Chhattisgarh, established by the Central Universities Act 2009 No. 25 of 2009 by the Government of India. It was formerly called Guru Ghasidas University established by an act of State Legislative Assembly, was inaugurated on June 16, 1983. The campus of Guru Ghasidas Vishwavidyalaya is extended over an area of about 283 hectares. The vegetation of the campus is dry deciduous. Plant resources are older than the university which represents an appearance of forest before the establishment of the university. Trees provide the most visible example of biodiversity across the campus, and ecologically they are key habitat for many faunas. Prior to developing an effective tree management strategy, it is essential to increase our understanding of the campus tree population and diversity. Baseline data on the richness, distribution, and population structure of tree species is useful for the conservation and management of tropical dry deciduous forests (Lal *et al.*, 2015). To reduce the biotic pressure, plantations can also be introduced as a supplement.

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MATERIALS AND METHODS

Study area:

Guru Ghasidas Vishwavidyalaya is situated in Koni village of Bilaspur district in Chhattisgarh state, spread over an area of about 283 hectares. It falls under tropical dry deciduous type of forest (Champion and Seth, 1968).

Sample collection and preservation:

A survey on various tree species of different families was made during January 2022 to June 2023 in Vishwavidyalaya campus. The campus was periodically and timely visited for the collection of samples and photographs of various tree species in different seasons. The samples were freshly collected in polybag for preservation and herbarium preparation and their photograph were taken by using DSLR (Nikon D5600) camera and mobile camera. These specimens were preserved as samples and herbarium using the Bentham and Hooker classification system (1872-1897) and deposited as voucher specimens at Department of Botany, Guru Ghasidas Vishwavidyalaya (A Central University), Koni-Bilaspur, Chhattisgarh.

Identification:

The collected samples are identified by their morphological appearance, botanical names, common name, family and habitat. Identifications were done by literatures available in the departmental library i.e., 'Flora of Madhya Pradesh', Vol. I by Verma *et al.* (1993), Vol. II by Mudgal *et al.* (1997) and Vol. III by Singh *et al.* (2001), 'Flora of Bilaspur', Vol. I by Panigrahi and Murti (1989) and Vol. II by Murti and Panigrahi (1999) with experts and an online web portal of Royal Botanic Gardens, Kew (Plants of the World Online-POWO). The Botanical name, Common name, Family, Photographs, Flowering and Fruiting season were recorded.

RESULTS AND DISCUSSION

A total of 34 tree species belonging to 32 genera and 15 families i.e., Anacardiaceae (2), Moraceae (4), Poaceae (1), Myrtaceae (3), Caricaceae (1), Fabaceae (7), Lythraceae (2), Phyllanthaceae (1), Annonaceae (3), Arecaceae (2) and Apocynaceae (3), Rubiaceae (1), Bignoniaceae (1), Combretaceae (2) and Sapotaceae (1) were recorded. They were the major vegetation in the campus. Maximum tree species recorded were belongs to family Fabaceae (7) followed by Moraceae (4), Apocynaceae (3), Myrtaceae (3) and so on. In present study, flowering period of 27 of the species were started in summer season i.e., February to April. While the fruiting period of maximum species were recorded in spring to rainy season like, February to September. The maximum number of tree species was recorded for a range of 1 to 7 for each family. Family Fabaceae was the most abundant in the campus, similar result has been obtained by Sharma *et al.* (2020). Whereas some of the workers in India and outside the country, recorded comparatively lower number of tree species viz., 20 by Ogwu *et al.* (2016), 24 by Oyerinde *et al.* (2018). While few workers documented contrastingly higher number of tree species like, 50 by Wiryono and Nurliana (2011), 53 by Qing (2016), 66 by Nandlal *et al.* (2023) in campuses of educational institutes worldwide. Considering the intrinsic worth and responsibilities in the environment, anthropogenic activities within the study region pose a threat to the survival of some tree species, particularly when it comes to cutting trees for infrastructure projects. Thus, in order to maintain environmental integrity, sustainable conservation activities should be focused on safeguarding their continued existence.

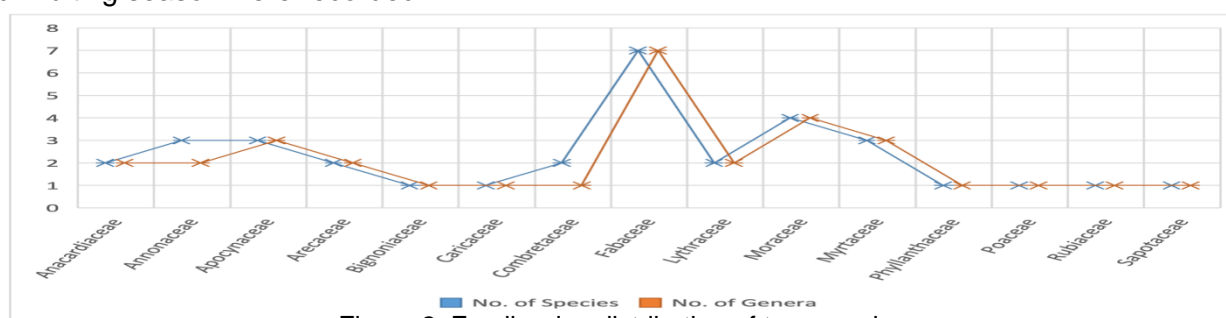


Figure 2: Family wise distribution of tree species

Table 1: List of Tree species found in the Guru Ghasidas Vishwavidyalaya Campus

Botanical Name	Common Name	Family	Flowering Period	Fruiting Period
<i>Anacardium occidentale</i> L.	Kaaju	Anacardiaceae	Jan-Mar	Feb-Apr
<i>Annona reticulata</i> L.	Ramphal	Annonaceae	Sep-Nov	Dec-May
<i>Annona squamosa</i> L.	Sitaphal	Annonaceae	Mar-May	Aug-Jan
<i>Artocarpus heterophyllus</i> Lam.	Kathal	Moraceae	Mar-Apr	Jun-Aug
<i>Bambusa vulgaris</i> Schrad. ex J.C.Wendl.	Baans	Poaceae	Once in life	Once in life
<i>Butea monosperma</i> (Lam.) Kuntze	Palash	Fabaceae	Jan-Mar	Feb-Mar
<i>Carica papaya</i> L.	Papita	Caricaceae	Throughout the year	Throughout the year
<i>Cascabela thevetia</i> (L.) Lippold	Peeli kaner	Apocynaceae	Throughout the year	Throughout the year
<i>Cassia fistula</i> L.	Amaltas	Fabaceae	Mar- Jul	Jul-Dec
<i>Cocos nucifera</i> L.	Nariyal	Arecaceae	Oct-Dec	Jan-Jul
<i>Dalbergia sissoo</i> Roxb. ex DC.	Shisham	Fabaceae	Mar-Jun	Apr-Jul
<i>Delonix regia</i> (Bojer ex Hook.) Raf.	Gulmohar	Fabaceae	May-Jul	Feb-Jul
<i>Erythrina suberosa</i> Roxb.	Gadha palash	Fabaceae	Apr-May	May-Jul
<i>Eucalyptus globulus</i> Labill.	Nilgiri	Myrtaceae	Apr-Aug	May-Aug
<i>Ficus benjamina</i> L.	Weeping fig	Moraceae	Feb-Apr	Mar-Apr
<i>Ficus microcarpa</i> L.f.	Chinese banyan	Moraceae	Feb-Apr	Mar-Jun
<i>Lagerstroemia parviflora</i> Roxb.	Senha	Lythraceae	Apr-Jul	May-Jul
<i>Madhuca longifolia</i> (L.) J. F. Macbr.	Mahua	Sapotaceae	Feb-Apr	Mar-Apr
<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Champa	Apocynaceae	Jun- Sep	Sep- Oct
<i>Mangifera indica</i> L.	Aam	Anacardiaceae	Jan-may	Mar-Jun
<i>Melaleuca citrina</i> (Curtis) Dum.Cours.	Bottle brush	Myrtaceae	Feb-Apr	Mar-May
<i>Monoon longifolium</i> (Sonn.) B. Xue & R. M. K. Saunders	False ashoka	Annonaceae	Apr-Jun	May-Jun
<i>Morus alba</i> L.	Sehtoot	Moraceae	Feb-Mar	Mar-Apr
<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Kadam	Rubiaceae	Apr-Aug	Jun- Aug
<i>Peltophorum pterocarpum</i> (DC.) Backer ex K.Heyne	Peela gulmohar	Fabaceae	Mar-May	Sep-Nov
<i>Phyllanthus emblica</i> L.	Amla	Phyllathaceae	Feb-May	Mar-May
<i>Plumeria alba</i> L.	Champa	Apocynaceae	Jun-Nov	
<i>Psidium guajava</i> L.	Amrud, bihi	Myrtaceae	Apr-May	May-Jul
<i>Punica granatum</i> L.	Anar	Lythraceae	Throughout the year	Throughout the year
<i>Roystonea regia</i> (Kunth) O. F. Cook	Royal palm	Arecaceae	Mar	Mar onwards
<i>Spathodea campanulata</i> P. Beauv.	African tulip	Bignoniaceae	Spring	Dec- Mar
<i>Tamarindus indica</i> L.	Imli	Fabaceae	May-Jul	Jun-Jul
<i>Terminalia catappa</i> L.	Badam	Combretaceae	Feb-Mar	Aug-Sep
<i>Terminalia pendula</i> (Edgew.) Gere & Boatwr.	Dhaura	Combretaceae	Jun-Sep	Jul-Oct

CONCLUSION

On the basis of the present study, it is concluded that the campus is enriched with various tree species of different habitats. The knowledge about the tree species is essential for assessing them, though further strategy is needed to conserve them. This study indicates their rich diversity, followed by various species due to suitable climatic condition as well as their

survival capacity in the campus. Deciduous tree species are mostly seen as they cover a larger part of the area. The flowering and fruiting season related to their phenology was also investigated. The younger generation's understanding of plant diversity will benefit attempts to conserve biodiversity in the campus. Increasing outdoor education should help students become more connected to the nature.

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