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RESEARCH ARTICLE

Floristic Diversity and Economic Importance of Woody Plants in the Campus of GGM Science College, Jammu, UT of Jammu and Kashmir, India.

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Abstract: The present study assessed the species diversity, floristic composition, growth forms, plant-part utilization and economic importance of common plants growing on the campus of GGM Science College, Jammu, J&K, India. A total of 68 plant species belonging to 34 families were documented. Fabaceae was the most represented family with 8 species, followed by Moraceae with 6 species, Trees dominated the campus flora, comprising 51 species (75.0 %), followed by shrubs (15 spp., 22.1%) and climbers (2 sps., 2.9%), indicating a predominantly woody vegetation structure. Leaves were the most frequently utilized plant parts, followed by bark, wood and fruits, reflecting the diverse ethnobotanical and economic applications of the recorded flora. The documented plants possess considerable economic significance in timber production, medicine, pharmaceuticals, biofuel and essential-oil industries, agriculture and agroforestry, horticulture and landscaping, food and culinary applications. Several species, including *Tectona grandis*, *Dalbergia sissoo*, *Azadirachta indica*, *Phyllanthus emblica*, *Terminalia arjuna* and *Mangifera indica*, have particularly important commercial, medicinal or ecological value. The findings demonstrate that the college campus represents a diverse and multifunctional plant resource with substantial educational, ecological and socioeconomic importance. Development of a digital plant inventory, QR-based identification system and botanical trail could enhance awareness and educational use. The study provides a baseline for future biodiversity monitoring and supports conservation-oriented and sustainable management of campus vegetation.

Keywords: Biodiversity monitoring, biofuels, socio-economic importance, sustainable management, traditional formulations.

Introduction

Plant diversity is essential for maintaining ecosystem stability and functioning, contributing to primary productivity, carbon storage, nutrient cycling and soil conservation while offering critical habitats for diverse organisms (Chapin et al., 2000; Tilman et al., 2014).. Beyond their ecological roles, plants also provide valuable resources, including food, medicine, timber, fuel and ornamental products that sustain human livelihoods (Pimentel et al., 1997; Hamilton, 2004). Floristic inventories are therefore important for

documenting species composition, understanding vegetation patterns and developing effective biodiversity conservation and management strategies (Gaston, 2000; Mulligan et al., 2005).

The western Himalaya, including Jammu and Kashmir, supports diverse vegetation owing to variations in altitude, climate, soil and topography (Malik et al., 2010; Wani et al., 2022).. Woody plants, including trees, shrubs, sub-shrubs and woody climbers, play a vital role in terrestrial ecosystems by providing structural complexity, regulating microclimatic conditions, stabilising soil and supporting diverse organisms (Ellison et al., 2005; Lindenmayer et al., 2012). Their perennial nature also makes them important indicators of environmental conditions, ecological changes and land-use history (Naveh, 1994; Westing, 1982). Previous studies have documented the region's rich woody flora (Malik et al., 2010), woody plant diversity in the subtropical Kandi Siwaliks of of Jammu and Samba districts (Sharma and Kant, 2014), floristic variation across forest types and habitats in Jammu and Kashmir (Haq et al., 2024), floristic diversity of Overa Wildlife Sanctuary (Aijaz et al., 2022), alpine flora of the Kashmir Himalaya (Rasray and Lone, 2026). Recent investigations carried out by Beigh et al., 2026 in urban and peri-urban areas of Ganderbal, Kashmir have further highlighted the influence of urbanisation, habitat disturbance and other anthropogenic pressures on regional plant diversity. These studies emphasise the need for floristic documentation at different spatial scales.

Educational campuses represent important urban green spaces comprising planted trees, ornamental shrubs, native vegetation and naturally regenerating species. Campus-based floristic studies, including those conducted at Bharathiar University (Rajendran et al., 2014) and the Odisha University of Agriculture and Technology (Dash et al., 2021), have demonstrated their value for biodiversity documentation, conservation and environmental education. Despite the considerable floristic work on forests, protected areas, alpine ecosystems or broader regional floras, comparatively less attention has been given to the woody vegetation of individual educational institutions in the Jammu urban landscape.

Government Gandhi Memorial Science College, Jammu - a heritage college, represents an appropriate site for such an investigation. A systematic inventory of woody plants growing on the college campus will provide information not only on taxonomic diversity but also on the extent to which native, cultivated and introduced elements contribute to the campus flora.

In light of these considerations, the present study aims to:

1. Document the taxonomic diversity of woody plants within the GGM Science College campus;
2. Assess the ethnobotanical and economic utility of the documented flora.

The baseline inventory generated from this study is expected to facilitate future biodiversity monitoring, guide sustainable campus green-space management and contribute valuable empirical data to the broader phytogeographical documentation of the Jammu urban ecosystem.

Materials and Methods

Study Area

The present study was conducted in the campus of Government Gandhi Memorial (GGM) Science College, Jammu, UT of J&K, situated in southern foothills of the outer Himalaya. Geographically, the college lies within the urban landscape of Jammu and is closely associated with the **River Tawi,** an important river of the Jammu region and a major tributary of the Chenab River. The region experiences a subtropical climate characterized by hot summers, a monsoon period and relatively cool winters. Established in 1905, the college was originally founded as Prince of Wales College by His Highness Maharaja Sir Pratap Singh to commemorate the visit of His Royal Highness the Prince of Wales, the future King George V. The college has considerable historical and architectural significance and was accorded heritage status by the University Grants Commission (UGC), Government of India in 2015. The

campus contains several historic structures, including the Main Building, Physics and Chemistry Block and Geology Block, which form an important part of its architecture.

The campus has long-established vegetation which includes trees, shrubs and climbers, comprising both naturally occurring and planted species. The green cover contributes to the ecological character of this historic institutional landscape. Considering its long historical legacy, heritage status and relatively diverse green cover, GGM Science College provides an appropriate study site for documenting floristic diversity, evaluating the economic and ecological importance of common plant species and their conservation values.

Methodology

A systematic floristic survey was conducted from March to September 2026 to document the woody plant species growing on the college campus. Species were documented through field observations and photographs were also taken, particularly during the flowering and fruiting stages, to facilitate accurate identification. The plant species were identified using standard floras and taxonomic literature. Taxonomic identification was confirmed through consultation with taxonomic experts and comparison of plant specimens with those housed in the Herbarium of the University of Jammu. The nomenclature of all recorded woody plant species was validated using the Plants of the World Online (POWO) database, and only accepted scientific names were used in the present study.

Information regarding the economic importance and uses of the recorded woody plant species was collected from two sources: local informants and published literature. Primary information was obtained through informal interactions with local informants familiar with the plants and their uses. The information collected included the use of different plant parts for medicinal purposes, food, timber, fuelwood, fodder, ornamental planting and other practical applications, wherever applicable.

Secondary information on the economic uses of the recorded species was obtained through a review of published literature using online databases and scholarly platforms, including Google Scholar, ResearchGate, Scopus, Web of Science, ScienceDirect and PubMed.

Results and Discussion

Floristic composition and family representation

The present study documented a total of 68 plant specimens belonging to 34 families growing on the campus of GGM Science College, Jammu. The recorded flora showed considerable taxonomic diversity of woody growth forms. Among the families recorded, Fabaceae was the most represented family with 8 species, followed by Moraceae with 6 species, Apocynaceae and Myrtaceae with five species each. Arecaceae, Combretaceae, Lamiaceae and Meliaceae were represented by three species each (Fig. 1), whereas Annonaceae, Bignoniaceae, Cupressaceae, Cycadaceae, Euphorbiaceae, Malvaceae and Rutaceae were represented by two species each. The remaining families were represented by a single species.

The relatively high representation of Fabaceae, Moraceae, Apocynaceae and Myrtaceae indicates the importance of these families in the campus vegetation. Members of Fabaceae are widely cultivated and naturally established in the Jammu region because of their adaptability, ecological versatility and multiple uses, including timber, fodder, fuel, food and ornamental purposes. Similarly, members of Apocynaceae include several trees, shrubs and climbers that are commonly planted as ornamentals or occur as useful medicinal plants. The occurrence of several families represented by only one species suggests that the campus flora contains a broad taxonomic spectrum rather than being dominated by a few closely related groups.

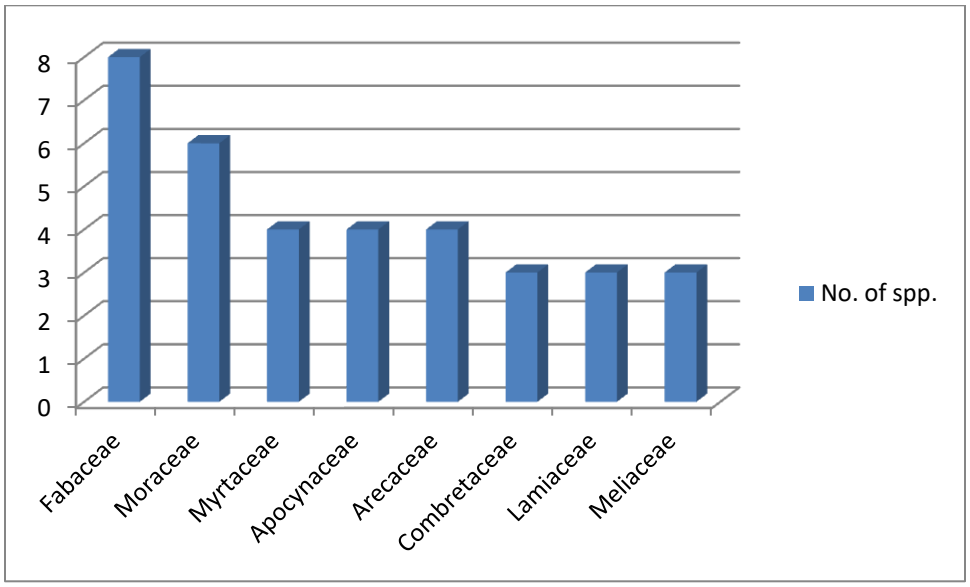


Fig 1:- Most represented plant families of woody flora of GGM Science College campus, Jammu.

Diversity of growth forms

The growth-form analysis showed a clear predominance of trees, with 51 species (75.0%), followed by shrubs with 15 species (22.1%) and climbers with 2 species (2.9%) (Fig 2). The dominance of trees is an important characteristic of the campus vegetation. Mature trees provide shade, reduce ambient temperature, intercept particulate matter, contribute organic matter through litter production and provide habitat for birds and other organisms. The presence of 15 shrub taxa also contributes to the structural complexity of the campus vegetation. Shrubs are frequently used in institutional landscapes for ornamental purposes, boundary planting and the development of understory vegetation.

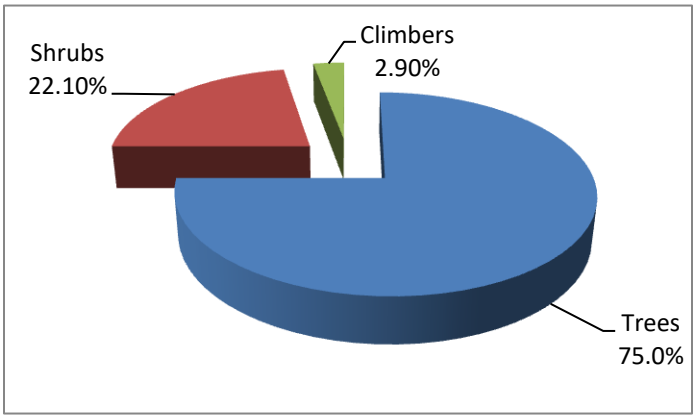


Fig 2:- Percentage distribution of life forms of recorded plant taxa.

Floristic studies across Jammu and Kashmir have highlighted considerable variation in plant diversity and vegetation structure across habitats and altitudinal gradients. Sharma and Kant (2014) documented 112 woody species in the subtropical Kandi Shiwaliks, while Aijaz et al. (2022) recorded 37 plant species across four habitats of Overa Wildlife Sanctuary. Haq et al. (2024) reported 451 species across 12 major forest types, underscoring the floristic heterogeneity of the Western Himalaya. Recent studies have

further documented new floristic records and distributional extensions (Thakur et al., 2025; Khuroo et al., 2025), while investigations in urban and peri-urban environments have highlighted the influence of anthropogenic pressures on plant diversity and composition (Beigh et al., 2026). Collectively, these studies emphasise the need for floristic assessments across diverse landscapes, including managed urban environments.

Educational campus-based studies in India have demonstrated their floristic significance. Rajendran et al. (2014) recorded 335 vascular plant species at Bharathiar University, while Dash et al. (2021) documented 118 tree species at the Odisha University of Agriculture and Technology, Bhubaneswar. Similarly, Bargali et al. (2025) recorded 251 plant species at the Dev Singh Bisht Campus of Kumaun University, Nainital. These findings highlight the botanical significance of educational campuses and provide a comparative basis for the present study. Accordingly, the present investigation documents the floristic diversity and economic importance of woody plants on the campus of GGM Science College, Jammu, thereby contributing to the understanding of campus vegetation and its ecological and socioeconomic significance.

Plant parts used

The recorded plants showed considerable diversity in terms of their economic importance. Leaves were the most frequently utilized plant part, with 32 species, followed by bark (21 spp.), wood (19), fruits (15), flowers (14), seeds (11), roots (8) and oil (5). Other economically utilized parts included latex (3 spp.), shoots, pods and whole plant (2 each), nuts, male cones, stem pith, whole plant, sap and resin (1 each) (Fig 3).

Leaves are commonly utilized for medicinal preparations, fodder, food, religious purposes and other traditional applications. Their high representation also reflects the fact that leaves are generally renewable plant resources and can often be collected without removing the entire plant. The considerable representation of bark and wood highlights the importance of woody species within the campus flora.

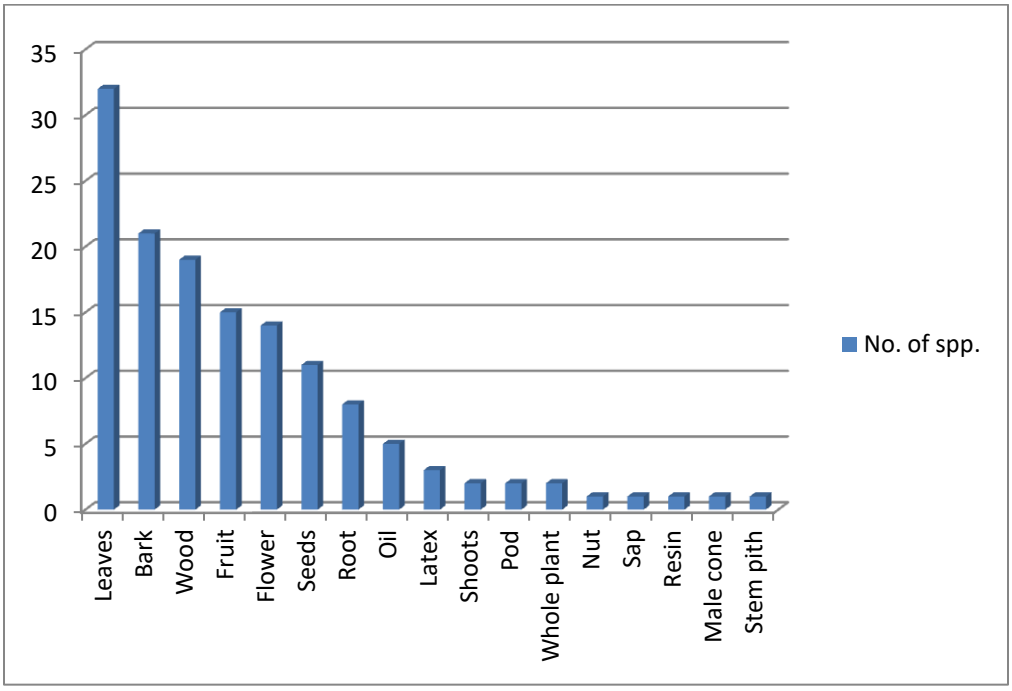


Fig 3:- Utilisation of different plant parts and corresponding species count.



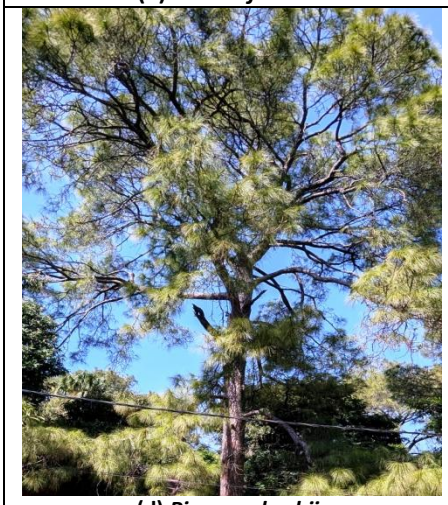
(a) *Cassia fistula*



(b) *Platanus orientalis*



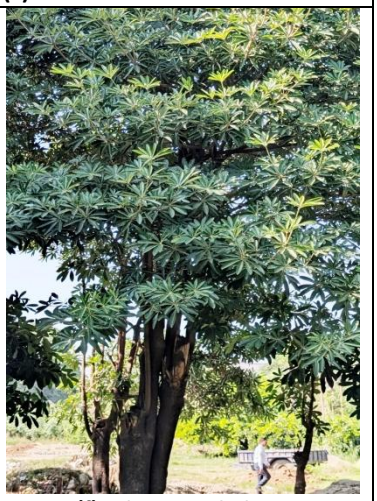
(c) *Hibiscus x rosa-sinensis*



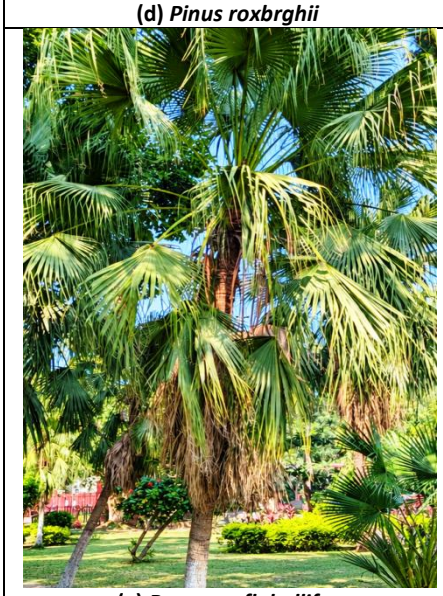
(d) *Pinus roxbrghii*



(e) *Cycas revoluta*



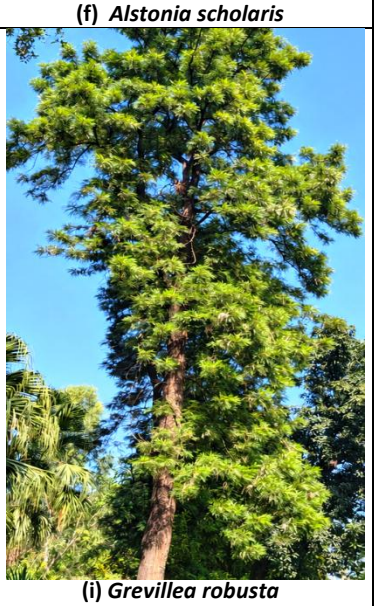
(f) *Alstonia scholaris*



(g) *Borassus flabellifer*



(h) *Eriobotrya japonica*



(i) *Grevillea robusta*

Fig 4 (a-i): Some woody plants growing in campus of GGM Science College, Jammu.

Economic importance

The evaluation of all the 68 reported plant species reveals that almost all recorded plants possess direct or indirect economic, commercial, medicinal or ecological value (Table 1). Based on their primary utilities, the economic contributions of these plants can be broadly classified into several key sectors: (i) Timber and wood products, (ii) Pharmaceuticals, medicinal and health sector, (iii) Biofuels, essential oils and industrial extracts, (iv) Agriculture, agroforestry and environmental management, (v) Horticultural, nursery and ornamental markets (vi) Food, beverages and culinary uses, and (vii) Educational significance.

Table 1. Recorded plant species and their economic importance.

S. No	*Botanical Name*	Vernacular Name	Habit	Family	Part Used	Uses
1	*Aegle marmelos* (L.) Correa	Bael, Stone Apple	Tree (T)	Rutaceae	Fruit, leaves, bark, roots	Fruit, leaves, bark and roots used in Ayurvedic medicine, leaves (Bilva Patra) used in worship of Lord Shiva.
2	*Albizia lebbeck* (L.) Benth.	Siris tree	Tree (T)	Fabaceae	Bark, leaves, flowers, seeds, wood, leaves and pods	Traditional treatment for asthma, colds, coughs, allergies, skin diseases and inflammation; wood for furniture, plywood and construction; leaves and pods as cattle feed (Verma et al., 2019).
3	*Ailanthus excelsa* Roxb.	Peru marum	Tree (T)	Simarouba ceae	Bark, leaves, wood	Traditional medicine for diarrhoea, dysentery, fever and skin diseases; wood for plywood, packing cases, matchsticks and light furniture; leaves as cattle fodder; afforestation and soil conservation.
4	*Alstonia scholaris* (L.) R.Br.	Devil tree / Blackboard tree / Saptaparni	Tree (T)	Apocynace ae	Bark, wood	Bark used medicinally for fever, malaria and digestive disorders; wood for blackboards, pencils, matchsticks and packing cases; ornamental and shade tree (Khyade et al., 2014).
5	*Araucaria columnaris* J.R. Forst. & G. Forst.	Columnar Norfolk pine / Cook pine	Tree (T)	Araucariac eae	Wood	Ornamental tree for parks, avenues and coastal planting; light softwood with limited use; windbreaks and landscaping (National Parks, 2026a).
6	*Areca catechu* (L.f) Willd.	Areca Palm, Betel Nut Palm	Tree (T)	Arecaceae	Nut, leaves	Indoor ornamental plant; nut extracts noted for potential wound healing; leaves used for biodegradable plates, bowls and cutlery (Peng et al., 2015; Salehi et al., 2020).
7	*Azadirachta indica* A. Juss.	Margosa tree / Neem tree	Tree (T)	Meliaceae	Leaves, bark, seeds, flowers, twigs (shoots)	Traditional medicine; neem extracts/azadirachtin as insecticides and repellents; twigs for Datun; ingredients in personal-care products (Mehta et al., 2021; Wylie & Merrell, 2022).
8	*Bauhinia purpurea* L.	Common Bauhinia in India	Tree (T)	Fabaceae	Young leaves, flowers, bark	Ornamental; young leaves and flowers used in regional cuisine/condiments; leaf and bark used in herbal medicine for cough and stomach ailments; cultural significance (Chanchal et al., 2015).

9	*Borassus flabellifer* L.	Palmyra palm	Tree (T)	Arecaceae	Roots	The decoction prepared from roots is used to alleviate respiratory and gastric disorders.
10	*Bougainvillea glabra* Choisy	Paper flower	Climber (C)	Nyctaginaceae	Leaves	Leaf extract used for controlling blood sugar.
11	*Camphora officinarum* Boerh. ex Fabr.	Camphor; Kapur	Tree (T)	Lauraceae	Wood	Applied to skin for pain and itching; used for toenail fungus, warts, insect bites, cold sores, hemorrhoids and osteoarthritis Wood (Lee et al., 2022).
12	Caryota urens L.	Fishtail Palm, Clustered Fishtail Palm	Tree (T)	Arecaceae	Not specified	Ornamental planting in gardens, parks and avenues; urban landscaping and roadside plantation; soil-erosion prevention; shade and scenic value (De Silva et al., 2022).
13	*Cascabela thevetia* (L.) Lippold	Yellow Oleander	Shrub (Sh)	Apocynaceae	Seed oil	Ornamental plant; biological pest control; seed oil used to make paint with antifungal, antibacterial and anti-termite properties (Bhagya, 2025).
14	*Crateva religiosa* G. Frost.	Sacred Garlic Pear, Temple Plant, Barna	Tree (T)	Capparaceae	Bark, leaves, flowers, fruit	Ayurvedic uses for kidney stones, inflammation, coughs, skin diseases and as laxative/diuretic; ornamental flowers; edible fruit; leaves as vegetable; fruits roasted; flowers pickled (Saleh et al., 2026).
15	*Cycas circinalis* L.	Queen sago / Madanmast ka phool	Tree (T)	Cycadaceae	Bark, seeds, tender leaves, leaves, male cones	Poultice for sores/swelling; tender-leaf juice for flatulence/vomiting; leaves for mats; male cones as insect repellents (Du et al., 2024).
16	*Cycas revoluta* L.	Sago palm / Japanese cycad	Tree (T)	Cycadaceae	Stem pith, leaves	Ornamental; sago/starch from stem pith after detoxification; landscaping and indoor decoration; religious and ceremonial use (Deora et al., 2020).
17	*Dalbergia sissoo* Roxb. ex DC.	Indian sissoo, Indian rosewood, Shisham	Tree (T)	Fabaceae	Leaves, bark, roots, oil, young shoots, green pods	Traditional remedies for skin disorders, diarrhoea, fever and rheumatism; oil for scabies; fodder for livestock.
18	*Delonix regia* (Bojer ex Hook.) Raf.	Royal Poinciana, Flame Tree, Flamboyant, Flame of the Forest	Tree (T)	Fabaceae	Various parts; especially leaves, flowers, bark and roots	Ornamental landmark species; shade tree; tourism and aesthetic value; supports urban biodiversity and may reduce heat effects in cities (Sharma & Arora, 2015; Modi et al., 2016).
19	*Erythrina variegata* L.		Tree (T)	Fabaceae	Seeds, bark, leaves	Aanti-inflammatory, analgesic, anxiolytic, neuroprotective,antioxidant, antimicrobial effects (Jiwnani et al., 2025)
20	*Eriobotrya japonica* (Thunb.) Lindl.	Loquat	Tree (T)	Rosaceae	Fruit, leaves	Edible fruit; jams/jellies; leaves for cough and respiratory issues; ornamental tree.
21	*Eucalyptus globulus* Labill.	Safeda	Tree (T)	Myrtaceae	Not specified	Eucalyptus/eucalyptus oil used for coughs, colds, congestion and muscle and joint pain.

22	*Euphorbia pulcherrima* Willd. ex Klotzsch	Poinsettia	Shrub (Sh)	Euphorbiaceae	Whole plant, latex	Decorative Christmas/winter plant; pot plant; whole plant/latex used in medicine; dried sap chemicals have pain-relieving effects (Zhu et al., 2022).
23	*Ficus benghalensis* L.	Indian banyan; Bhordh, badhoi	Tree (T)	Moraceae	Not specified	Used traditionally for intestinal infections/diarrhoea; hypoglycemic properties noted for blood sugar management, religious tree.
24	*Ficus carica* L.		Tree (T)	Moraceae	Fruits	Fruits are edible.
25	*Ficus elastica* Roxb. ex Hornem.	Variegated rubber tree	Tree (T)	Moraceae	Leaves, latex	Leaves have antimicrobial properties; ornamental houseplant; latex as alternate rubber source and noted for minor wounds/skin ailments (National Parks, 2026b).
26	*Ficus racemosa* L.		Tree (T)	Moraceae	Latex, fruit	Fruit is eaten raw to cure renal issues, cough and loss of voice (Singh et al., 2026)
27	*Ficus religiosa* L.	Peepul tree; Badh	Tree (T)	Moraceae	Leaves, bark	Leaves noted for antimicrobial properties and use against infections; bark decoction with jaggery and salt traditionally used for severe stomach pain (Jangde, 2015), religious tree.
28	*Grevillea robusta* A.Cunn. ex R.Br.	Silk oak / Silver oak	Tree (T)	Proteaceae	Not specified	Ornamental tree for avenues and gardens; timber for furniture and plywood (National Parks, 2026c)
29	*Hamelia patens* Jacq.	Firebush, Hummingbird bush	Shrub (Sh)	Rubiaceae	Not specified	Folk medicine for athlete's foot, skin problems, insect stings, ovarian and uterine disorders (Surana & Wagh, 2015).
30	*Hibiscus rosa-sinensis* L.	China rose	Shrub (Sh)	Malvaceae	Flowers, leaves	Ornamental; food/beverage production; dyes, cosmetics and medicines; traditional medicine; hair dye, food colouring and tea (Amtaghri et al., 2024).
31	*Jatropha curcas* L.	Jatropha / Physic nut	Shrub (Sh)	Euphorbiaceae	Oil	Non-edible oil for biodiesel; traditional medicine (purgative, anti-inflammatory, with caution due to toxicity); soil conservation/erosion control; live fencing (Kumar & Das, 2018; Gomes et al., 2018).
32	*Justicia adhatoda* L.	Malabar nut / Brehnkd	Shrub (Sh)	Acanthaceae	Leaves, flowers	Traditional use for cough, bronchitis, asthma and respiratory problems; source of vasicine; nectar for pollinators; ornamental.
33	*Juniperus horizontalis* Moench		Shrub (Sh)	Cupressaceae	Whole plant	Grown as ornamental plant
34	*Kigelia africana* (Lam.) Benth.	Sausage tree; Balam kheera	Tree (T)	Bignoniaceae	Wood	Wood used for dugout canoes, planks and fenceposts (Bello et al., 2016).
35	*Leucaena leucocephala* (Lam.) de Wit	Wild tamarind, White Leadtree	Shrub (Sh)	Fabaceae	Not specified	Quality animal feed; firewood/charcoal; wood for pulp and paper industry (Alemán-Ramirez et al., 2022).
36	*Magnolia champaca* (L.) Baill. ex Pierre	Champak	Tree (T)	Magnoliaceae	Flowers, wood	Gardens, parks and roadsides; wood for furniture, carving and construction; floriculture, perfume, timber and herbal-medicine industries.

37	*Mangifera indica* L	Mango	Tree (T)	Anacardiaceae	Fruit, leaves, flowers, bark	Edible fruit; leaves used in Hindu religious ceremonies and decorations; flowers have cultural significance; bark used in traditional remedies for rheumatism and diphtheria (Ediriweera et al., 2017; Mahalik et al., 2020).
38	*Melaleuca viminalis* (Sol. ex Gaertn) Byrnes	Bottlebrush	Shrub (Sh)	Myrtaceae	Leaves, flowers	Ornamental garden/street tree, invertebrate food and fuelwood (powo,2026)
39	*Melia azedarach* L.	Chinaberry, Persian lilac, Indian bead tree	Tree (T)	Meliaceae	Leaves, fruits, seeds, wood	Timber for furniture, cabinets and agricultural implements; biopesticidal/insecticidal properties; traditional medicine; ornamental/avenue tree (Ervina, 2018).
40	*Millingtonia hortensis* L.f.	Indian cork tree	Tree (T)	Bignoniaceae	Wood, flowers	Used for light construction and packing. Flowers are used in religious ceremonies.
41	*Monoon longifolium* (Sonn.) B. Xue & R.M.K. Saunders	False Ashoka / Indian mast tree	Tree (T)	Annonaceae	Wood, bark	Ornamental; parts used for septic infections, cough, diarrhoea and cancer; wood for furniture, packing cases, pencils and matchsticks; bark extract noted for reducing blood pressure and heart rate (Primus & Choo, 2026).
42	*Monstera deliciosa* Liebm.	Swiss cheese plant, Mexican bread fruit	Climber (C)	Araceae	Leaves	Popular indoor ornamental; nursery and floral-arrangement value; educational use for leaf morphology, aerial roots and climbing adaptations (powo, 2026).
43	*Morus alba* L.		Tree (T)	Moraceae	Fruit	Fruits are consumed as an appetizer, fruit juice is frecommended for treatment of jaundice (Singh et al., 2026).
44	*Murraya koengii* (L.) Jack	Kadipata	Shrub (Sh)	Rutaceae	Leaves	Spice and flavouring; traditional medicine for digestive problems; leaf essential oils for flavour/fragrance industries; food, herbal and nursery value (Nishan & Subramanian, 2015; Uraku & Nwankwo, 2015).
45	*Nerium oleander* L.	Oleander	Shrub (Sh)	Apocynaceae	Leaves, flowers, seeds, roots, sap	Landscaping and ornamental use; all parts highly toxic; sap used as rat poison; leaves insecticidal; roots used externally in traditional medicine (Farooqui & Tyagi, 2018).
46	*Phyllanthus emblica* L.	Amla	Tree (T)	Phyllanthaceae	Fruit	Rich source of vitamin C; fruit used for burning sensation in eyes; juice used in relation to cholesterol, fatty acids and triglycerides (Ahmad et al., 2021; Phadke et al., 2016).
47	*Pinus roxburghii* Sarg.	Chir Pine	Tree (T)	Pinaceae	Wood, oil, resin	Timber for houses, furniture, tea chests, musical instruments, railway sleepers and paper pulp; turpentine oil and rosin; oil/resin used for respiratory issues, infections and pain (Sharma et al., 2014).
48	*Platanus orientalis* L.	Oriental plane / Old World sycamore/ Chinar	Tree (T)	Platanaceae	Bark, leaves, wood	Ornamental and shade tree; timber for furniture and veneers; bark and leaves traditionally used as astringent and anti-inflammatory (Khan et al., 2015).

49	*Polyalthia longifolia* (Sonn.) Benth.& Hook.f. ex Thwaites	False Ashoka, Indian mast tree	Tree (T)	Annonaceae	Bark	Used in treatment of septic infections, cough, diarrhoea and cancer; antimicrobial, antioxidant, analgesic and antitumour activities; bark extract noted to reduce blood pressure and heart rate (Primus & Choo, 2026).
50	*Pongamia pinnata* (L.) Pierre	Pongamia/ Karanja/ Indian beach	Tree (T)	Fabaceae	Seeds/oil	Seed oil for biodiesel/renewable energy; soil improvement and erosion control; folk remedies including wound healing/digestive uses; shade and landscaping (Kesari et al., 2010; Deswal et al., 2015; Gresshoff et al., 2017).
51	*Premna serratifolia* L.	Headache tree; Premna	Shrub (Sh)	Lamiaceae	Leaves	Candidate for vegetables and herbal drinks; leaves reported with potential uses involving cancer, ageing, Parkinson disease, rheumatoid arthritis, skin melanogenesis, leishmaniasis, hepatoprotection, diabetes, atherosclerosis and obesity (Prashanth et al., 2017).
52	*Psidium guajava* L.	Guava	Small tree	Myrtaceae	Leaves, bark	Leaves as astringent for bowel troubles; bark decoction for diarrhoea; leaf decoction for cough, throat and chest ailments (Díaz-de-Cerio et al., 2017).
53	*Pterospermum acerifolium* (L) Willd.	Dinnerplate tree, Kanak Champa, Maple-Leaved Bayur tree, Muchkund	Tree (T)	Malvaceae	Wood, leaves, flowers	Wood for planks, packing-cases and construction; leaves used as plates; flower paste used against headache (Jena et al., 2023).
54	*Putranjiva roxburghii* Wall.	Putranjiva, Lucky bean tree; Putijia, Jiyopota, Pattajadi	Tree (T)	Putranjivaceae	Wood, seed, bark, leaves, fruits	Wood for burning and pulp; essential oil from seed; bark and leaves used as medicine; leaves and fruits used medicinally for rheumatism (Dar et al., 2018).
55	*Roystonea regia* (Kunth) O.F.Cook	Cuban royal palm, Bottle palm	Tree (T)	Arecaceae	Leaves, wood, roots	Landscaping and ornamental use; trunks/leaves for simple-house construction; wood for handicrafts; roots traditionally used for diabetes (National Parks, 2026d).
56	*Salix alba* L.	White willow / Sohaa botal bursh	Tree (T)	Salicaceae	Wood, bark, roots	Wood for utensils, canoes, baskets, furniture and carvings; bark used traditionally for inflammation, pain and fever; roots help soil stabilization (Piatczak et al., 2020)
57	*Syzygium cumini* (L.) Skeels	Indian blackberry	Tree (T)	Myrtaceae	Leaves, seeds, fruit	Dried seed powder consumed with for treatment of diabetes, water.Leaves and bark rae chewed as a remedy for oral ulcers, Anorexia is cured by taking drink produced from its fruits (Singh et al., 2026)
58	*Senna alexandrina* Mill.	Alexandrian senna, Indian senna	Shrub (Sh)	Fabaceae	Not specified	Natural laxative and purgative; source of sennosides for pharmaceutical preparations; herbal teas and medicines; constipation treatment under medical guidance (Alshehri et al., 2022).

59	*Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult.	Crape Jasmine	Shrub (Sh)	Apocynaceae	Not specified	Ornamental landscaping for fragrant flowers; traditional medicinal use for fevers, inflammation, skin issues, headaches, hypertension and snake/scorpion bites; incense and red dyes (Raut et al., 2022).
60	*Tectona grandis* L.f.	Teak	Tree (T)	Lamiaceae	Wood	High-value timber for furniture, ship decking, flooring and construction; export wood industry; carbon sequestration/environmental value; minor traditional medicinal use (Asdaq et al., 2022).
61	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	Arjun tree	Tree (T)	Combretaceae	Not specified	Ayurvedic use for heart conditions, blood-pressure regulation and antioxidant effects; extracts with potential antibacterial, antifungal and antiparasitic activity; source of tannins, flavonoids, phenolics and glycosides (Kumar et al., 2023; Dwivedi et al., 2016).
62	*Terminalia bellirica* (Gaertn.) Roxb.	Beleric; Behra	Tree (T)	Combretaceae	Fruit	Fodder for cattle; fruit eaten as food and used in Indian traditional medicine for hypertension, cancer, dysuria and inflammation (Gupta et al., 2020).
63	*Terminalia chebula* Retz.		Tree (T)	Combretaceae	Fruit	fruit pulp consumed with honey in case of asthma, cough and piles (Kumar et al., 2021)
64	*Thuja occidentalis* L.	White cedar	Tree (T)	Cupressaceae	Wood	Traditional treatment for warts, skin diseases, urinary problems and respiratory disorders; gardens, parks and hedges; air-quality/dust benefits; sacred use; insect-resistant wood for small articles/crafts (Naser et al., 2005).
65	*Toona ciliata* M. Roem.	Toon, Indian red cedar	Tree (T)	Meliaceae	Wood, bark	High-quality timber for furniture, doors and paneling; plywood and veneer; traditional medicinal uses; shade and avenue tree (Zhang et al., 2021).
66	*Vitex negundo* L.	Chinese chaste tree / Bana / Nirgundi	Shrub (Sh)	Lamiaceae	Roots, leaves, flowers, fruits, bark	Herbal oils, pastes, juices and powders; hedge, windbreak and soil conservation; flavonoids, terpenoids and iridoids studied pharmacologically (Zheng et al., 2015).
67	*Zamia furfuracea* L.f. ex Aiton	Cardboard plant	Tree (T)	Zamiaceae	Seeds	Ornamental cycad; commercial nursery propagation; teaching/research; seeds contain toxic compounds and are not used as food (Du et al., 2024).
68	*Ziziphus mauritiana* Lam.	Ber, Indian jujube	Tree (T)	Rhamnaceae	Fruits	Fruits are consumed fresh, dried or processed int jams and pickles.

(i) Timber, wood products and construction industry

Several species documented in the present study are commercially valuable for high-grade timber, carpentry and construction as mentioned below;

High-value timber & furniture: Species such as *Tectona grandis* (Teak), *Dalbergia sissoo* (Indian rosewood), *Toona ciliata* (Indian red cedar) and *Albizia lebbeck* (Siris tree) are heavily utilized for premium furniture, construction, ship decking, flooring, panels and cabinetry. Light timber & utility wood: Trees like *Alianthus excelsa*, *Alstonia scholaris*, *Monoon longifolium* (*Polyalthia longifolia*), and *Pinus roxburghii* (Chir Pine) provide light woods and softwoods essential for plywood, packing cases, matchsticks, blackboards, pencils and tea chests. Specialized Wood Crafts: *Salix alba* (White willow) and *Kigelia africana* supply wood traditionally and commercially crafted into utensils, canoes, baskets, carvings and fenceposts.

(ii) Pharmaceutical, medicinal and health sectors

Many documented plants serve as raw materials for modern medicine and traditional formulations (Ayurveda and folk medicine) as mentioned below; Ayurvedic and herbal formulations: Species such as *Aegle marmelos* (Bael), *Phyllanthus emblica* (Amla), *Terminalia arjuna* (Arjun tree) and *Justicia adhatoda* (Malabar nut) are commercially and medicinally significant for manufacturing cardiovascular therapeutics, respiratory remedies, digestives, and immunity boosters. Anti-inflammatory and antipyretic agents: Plants like *Azadirachta indica* (Neem) and *Salix alba* provide valuable active compounds for dermatological, analgesic and anti-infective treatments. Natural laxatives and purgatives: *Senna alexandrina* is a major industrial source of sennosides, widely processed into pharmaceutical-grade natural laxatives.

(iii) Biofuels, essential oils and industrial extracts

Several reported species provide non-timber forest products (NTFPs) and raw materials for chemical, energy and cosmetic industries as discussed below

Pongamia pinnata (Karanja) and *Jatropha curcas* are economically prominent for their non-edible seed oils, which serve as sustainable feedstocks for biodiesel and renewable energy production. *Pinus roxburghii* yields commercially vital turpentine oil and rosin, supporting chemical and manufacturing industries. Plants such as *Melaleuca viminalis* (Bottlebrush), *Murraya koenigii* (Curry leaf) yield essential oils rich in active compounds (e.g., 1,8-cineole), driving the flavor, fragrance, and cosmetic sectors.

(iv) Agriculture, agroforestry and environmental services

Several plants contribute significantly to agricultural productivity and ecological sustainability:

Pest control and biopesticides: *Azadirachta indica* (Neem) and *Cascabela thevetia* provide natural insect repellents, azadirachtin, and antifungal/antibacterial seed oils used in eco-friendly agricultural pest management. Fodder and livestock feed: Tree and shrub foliage from *Albizia lebbeck*, *Alianthus excelsa*, *Dalbergia sissoo*, *Leucaena leucocephala*, and *Terminalia bellirica* function as vital nutritional supplements and fodder for livestock. Soil conservation and landscaping: Species like *Jatropha curcas*, and *Pongamia pinnata* play an essential economic and ecological role in soil stabilization, erosion control, live fencing, and land reclamation.

(v) Horticultural, nursery and ornamental markets

A substantial portion of the recorded species drives the multi-billion-dollar global horticulture, urban landscaping and floriculture industries:

Urban greening and shade trees: Landmark and avenue trees such as *Delonix regia* (Flame Tree), *Grevillea robusta* (Silver oak), *Platanus orientalis* and *Roystonea regia* enhance urban microclimates, reduce urban heat island effects and support tourism and aesthetics.

Indoor and Outdoor Ornamentals: Popular commercial nursery plants-including *Monstera deliciosa*, *Araucaria columnaris* and various palms - generate high commercial revenue through retail plant trade and interior landscaping.

(vi) Food, beverage and culinary industries

Several documented plants contribute to the agricultural food economy, providing direct human nutrition, spices and additives: Edible fruits and pulps are supplied by *Aegle marmelos* (Bael juice/Panna), *Mangifera indica* (Mango), *Eriobotrya japonica* (Loquats) and *Phyllanthus emblica* (Amla). Various spices, flavorings and regional culinary ingredients are derived from *Murraya koenigii* and *Bauhinia purpurea*..

(vii) Educational significance

Proper labeling or QR based identification system and development of a campus plant inventory or botanical trail could further increase the educational value of this biological resource. The economic-use data also emphasize the importance of conserving campus vegetation. Several plant parts are associated with direct human use, but sustainable utilization is essential to avoid damaging living plants. In particular, harvesting of roots, bark and wood can have greater impacts than collection of renewable parts such as leaves, flowers or fruits. Consequently, conservation-oriented campus management should prioritize the protection of mature trees and other economically important species while promoting awareness of their ecological and socioeconomic value.

Overall, the study indicates that the flora of GGM Science College, Jammu represents a diverse and multifunctional plant resource. The findings provide a baseline for future floristic inventories, biodiversity monitoring and development of conservation and sustainable campus-management strategies

Conclusion.

The present study documented 68 plant species belonging to 34 families on the campus of GGM Science College, Jammu, highlighting its floristic diversity and the predominance of trees. The recorded flora exhibited diverse economic uses, including timber, medicine, food, horticulture and environmental management, underscoring its ecological and socioeconomic significance. The findings provide a baseline for future floristic inventories, biodiversity monitoring and assessment of changes in campus vegetation. The study also offers scope for developing a systematically labelled plant inventory, botanical trail and educational resources to promote botanical awareness among students and research scholars. Integrating these findings into campus landscaping and conservation planning could help protect economically valuable species, encourage sustainable plant-resource utilization and enhance the ecological value of the institutional landscape. Further studies on seasonal variation, regeneration, carbon storage and ecosystem services would provide a more comprehensive understanding of the campus flora.

Declarations

Competing interests: The authors have no competing interests to disclose.

Authors' contributions: BPS, RKG, RB, FA, SK, MB, AK and VS devised the study and collected the data.BPS, FA, and VS framed the draft and wrote the manuscript.RKG, RB, SK, MB and AK participated in, editing, compiling and interpretation of data and finalizing the draft.

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