



JOURNAL OF THE ROYAL LAUREATES ACADEMY

www.rlaindia.org

A FLORISTIC ASSESSMENT OF BALOD DISTRICT, CHHATTISGARH, INDIA

Poornima Pathare¹, Dr. Himani Sandey², Vijay Sahu³

¹Ph.D. Scholar, Department of Botany, Dr. C.V. Raman University, Kota, Bilaspur (C.G.)

²Assistant Professor, Department of Botany, Dr. C.V. Raman University, Kota, Bilaspur (C.G.)

³HS Mendoli Department, Dantewada (C.G.), India

ABSTRACT

Floristic inventories play a crucial role in understanding plant diversity, ecosystem structure, and conservation priorities, particularly in biodiversity-rich but underexplored regions. The present study assesses the floristic composition of Balod District, located in the central Indian state of Chhattisgarh, an area dominated by tropical dry deciduous forests and characterized by undulating terrain and heterogeneous soil conditions. Systematic field surveys were conducted from August 2024 to June 2025 to document angiosperm diversity across a range of habitats, including forest interiors, agricultural margins, village fringes, wetlands, grasslands, and hill slopes. Standard floristic methods were employed for plant collection, identification, and classification.

The study recorded a total of 20 angiosperm species belonging to many genera and any families, indicating considerable floristic richness within the district. Fabaceae was the most dominant family, followed by Asteraceae, Euphorbiaceae, and Rubiaceae, reflecting their wide ecological amplitude and adaptability to dry deciduous forest conditions. Life-form analysis revealed a predominance of trees and herbs, suggesting a structurally diverse vegetation system influenced by seasonal climatic variation. Several recorded species possess high medicinal, ecological, and economic value and are extensively utilized by local and tribal communities for traditional healthcare, livelihood support, and cultural practices.

Keywords

Floristic diversity, Ethnobotany, Balod district, Chhattisgarh, Phenology, Medicinal plants, Biodiversity conservation

1. INTRODUCTION

India is globally recognized as one of the twelve megadiverse countries, supporting nearly 8% of the world's plant species due to its wide range of climatic conditions, diverse topography, and varied ecosystems (Champion & Seth, 1968). The country's floristic richness plays a vital role in maintaining ecological stability and supporting human livelihoods. Among Indian states, Chhattisgarh occupies a prominent position because of its extensive forest cover and rich diversity of medicinal and economically important plant species. Owing to this abundance, the state is often referred to as the "Herbal State of India" (MoEFCC, 2020). The diverse physiography and tropical monsoon climate of the region favor the development of predominantly tropical dry deciduous forests.

Balod District, carved out from Durg District in 2012, is situated in the central part of Chhattisgarh and represents an ecologically significant landscape. The district is characterized by undulating terrain, heterogeneous soil types, and varied habitat conditions that support diverse plant communities. Forest ecosystems in Balod District play a crucial role in soil conservation, climate regulation, and the sustenance of local and tribal populations. Indigenous communities inhabiting the region rely extensively on forest resources for food, medicine, fuel, fodder, and cultural practices (Gupta & Gupta, 2017).

Despite its ecological and ethnobotanical importance, comprehensive floristic studies in Balod District are limited. Floristic inventories are fundamental for understanding plant species composition, vegetation structure, and ecological patterns, and they provide baseline data essential for biodiversity conservation and sustainable resource management (Hajra et al., 1996; Sharma et al., 2004). In the face of increasing anthropogenic pressures such as deforestation, agricultural expansion, and unregulated exploitation of forest resources, detailed documentation of plant diversity has become increasingly important.

The present study aims to document the angiosperm diversity of Balod District, identify dominant plant families and life forms, and assess species of ecological and ethnobotanical significance. The study is expected to contribute baseline data for future biodiversity assessments, conservation planning, and sustainable forest management in central India.

2. STUDY AREA

The present study was conducted in Balod District, situated in the central part of the state of Chhattisgarh, India. The district lies between 20.70°N–21.40°N latitude and 81.20°E–81.60°E longitude and covers a total geographical area of approximately 3,527 km². Administratively, Balod District occupies an ecologically important position due to its forest cover, varied terrain, and proximity to other forest-dominated districts of central India.

To capture the floristic variation across different habitat types, major study sites were selected within the district. These included Dondi, characterized by tropical dry deciduous forests and predominantly tribal settlements; Dondilohara, representing mixed forest–agricultural landscapes; and Gurur, which comprises riparian zones, grasslands, and cultivated fields. The selection of these sites enabled comprehensive sampling across natural, semi-natural, and human-influenced ecosystems.

Balod District experiences a tropical monsoon climate, which strongly influences vegetation patterns. The summer season extends from March to June and is characterized by high temperatures and dry conditions. The monsoon period lasts from July to October, during which the district receives moderate to heavy rainfall, contributing significantly to soil moisture and plant growth. Seasonal climatic variation plays a crucial role in determining species composition and phenological patterns (MoEFCC, 2020).

The major soil types found in the district include lateritic soils, sandy loam soils, and alluvial soils along riverbanks and riparian areas. These heterogeneous soil conditions support diverse plant communities with varying ecological requirements. According to the forest classification system of Champion and Seth (1968), the natural vegetation of Balod District falls under Southern Tropical Dry Deciduous Forests. These forests harbor a wide range of medicinally, economically, and ecologically important plant species, contributing significantly to regional biodiversity and local livelihoods.

3. MATERIALS AND METHODS

Research Design

The present study followed a descriptive and exploratory research design to document the floristic diversity and associated ethnobotanical knowledge of Balod District, Chhattisgarh. Both qualitative and quantitative approaches were employed to achieve a comprehensive

understanding of plant diversity, vegetation structure, seasonal variation, and traditional plant use. Such integrated approaches are widely recommended for floristic and ecological studies (Hajra et al., 1996; Sharma et al., 2004). The study comprised floristic surveys for species identification, seasonal diversity assessment across summer, monsoon, and winter periods, ethnobotanical documentation through community interactions, and phenological observations.

Field Survey and Sampling Technique

Extensive field surveys were conducted during different seasons to record plant species from forested, agricultural, and riparian zones of the district. A stratified random sampling method was adopted to ensure representative sampling of major ecological habitats. The study area was divided into three primary ecological strata: (i) forested areas, (ii) agricultural and wasteland areas, and (iii) riparian and grassland zones. Sampling locations within each stratum were selected randomly to reduce sampling bias and capture habitat heterogeneity.

Vegetation analysis was carried out using quadrat sampling methods. Quadrat size of 5×5 m was employed, and ten quadrats were laid at each sampling site. Data on species richness, frequency, density, and abundance were recorded following standard vegetation analysis procedures (Chen & Wu, 2022).

Floristic Identification

Floristic identification was performed through detailed field observations and consultation of standard taxonomic literature and regional floras. Identifications were verified using authoritative references such as *Flora of Madhya Pradesh* (Hajra et al., 1996), *Flora of Chhattisgarh* (Sharma et al., 2004), and online taxonomic databases including *The Plant List*

(2013). Collected plant specimens were pressed, dried, and mounted on herbarium sheets. Each specimen was labeled with essential botanical details such as locality, habitat, date of collection, and habit, and preserved following standard herbarium preparation techniques for future reference and taxonomic verification.

Ethnobotanical Data Collection

Ethnobotanical information was gathered through semi-structured interviews and discussions with local healers, village elders, and knowledgeable community members. Data focused on

medicinal uses, plant parts utilized, methods of preparation, and cultural significance. Ethical considerations were maintained by obtaining prior informed consent from all participants. The methodology followed standard ethnobotanical documentation practices (Bhogaonkar&Devarkar, 2014; Gupta & Gupta, 2017).

Phenological Observations

Phenological observations were conducted on a monthly basis to record leafing, flowering, fruiting, and seed dispersal stages of selected plant species. Based on these observations, a phenological calendar was prepared to understand seasonal reproductive patterns and their relationship with climatic conditions, which is essential for ecological and conservation studies (MoEFCC, 2020).

4. RESULTS AND DISCUSSION

The floristic survey conducted in Balod District recorded a total of 20 angiosperm species, indicating substantial plant diversity within the study area. The comparatively high representation of herbaceous species suggests a well-developed understory vegetation, largely influenced by seasonal rainfall patterns and soil moisture availability typical of tropical dry deciduous forests (Champion & Seth, 1968; MoEFCC, 2020).

Several plant species recorded during the study are of considerable ecological and medicinal and economical importance. Tree species such as *wendlandia glabrata* conservationists often recommend nursery propagation and transplantation to help rebuild populations and maintain ecosystem balance and ecosystem sustainability. Tree species *Pterocarpus marsupium* is an important tree species with significant ecological and economic value. Its medicinal properties and high quality timber make it a valuable resource in traditional and modern practice. Medicinally important species including *Ipomoea obscura*, *Mimosa pudica*, *Barriacristata* and *Capparis zeylanica* are widely used in traditional healthcare practices.

Ethnobotanical observations revealed that local communities, particularly the Gond and Halba tribes, utilize more than 20 plant species for medicinal, domestic, and cultural purposes. This strong dependence on forest resources reflects close socio-ecological relationships and emphasizes the importance of community involvement in conservation efforts. Similar ethnobotanical utilization patterns have been reported from other tribal-

dominated districts of Chhattisgarh, such as Dantewada and Bastar (Gupta & Gupta, 2017; Sahu et al., 2014).

Table 1. Floristic and Ethnobotanical Documentation of Plant Species Recorded in Balod District, Chhattisgarh

S. No.	Botanical Name	Family	Habit	Ethnobotanical / Ecological Uses
1.	<i>Mimosa Pudic</i>	Fabaceae	Herb	wound healing, Anti-inflammatory and Anti-diabetic
2.	<i>Curcuma Caesia</i>	Zingibarace	Herb	wound healing, Anti-inflammatory, Anti bacterial , skin disease.
3.	<i>Bareria Cristata</i>	Acantheaceae	Shrub	Anti-inflammatory properties, Teeth pain, fever.
4.	<i>Hyttis Suaveolens</i>	Lamiaceae	Shrub	Anti Bacterial, properties, Anti Fungal propreties, wound healing, headache, cold cough fever.
5.	<i>Crotalaria juncea</i>	Fabaceae	Herb	Skin disease
6.	<i>Sigesbeckia orientalis</i>	Astaraceae	Herb weeds	Anti-inflammatory and Anti-bacterial propreties, skin disease, swelling, arthritis.
7.	<i>Spermacoce Ocymoides</i>	Rubiaceae	Herb	Skin disease, Stomuch ache, wound healing, Anti microbial properties urinary disease.
8.	<i>Alternanthera sessilis</i>	Amranthaceae	Herb	Weakness, eye irritation, wound healing, Fever.
9.	<i>Pterocarpus Marsupium</i>	Fabaceae	Tree	Diabetic control, skin disesase, wound healing.
10.	<i>Wendlandia tinctoria</i>	Rubiaceae	Shrub	Loss motion releaf Anti bacterial properties.
11.	<i>Charysopogon zizanioides</i>	Poaceae	Anual Herb	Urinary disease , skin disease.
12.	<i>Spermacoce alata</i>	Rubiaceae	Herb	Anti bacterial propertice, fever, skin disease.
13.	<i>Crossandra infundibuliformis</i>	Acanthaceae	Shrub	Skin disease, eye irritation, wound healing.

14.	<i>Abelmoschus Fiulenus</i>	Malvaceae	Shrub	Urinary disease, stone disease, skin swelling.
15.	<i>Capparis Zeylanica</i>	Caparaceae	Shrub	Anti-microbial and Anti-inflammatory propertic, Joint pain.
16.	<i>Ipomoea obscura</i>	Convolvulaceae	Herb Climber	Wound healing, skin disease
17.	<i>Senna occidentalis</i>	Fabaceae	Shrub	Fever, malarial, skin disease, constipation.
18.	<i>Wendlandia glabrata</i>	Rubiaceae	Tree	Loose motion relief, fever, skin disease, wound relief, swelling.
19.	<i>Eranthemum pulchellum</i>	Acanthaceae	Shrub	Skin disease, fever, headache, Anti-inflammatory properties.
20.	<i>Ageratum Conyzoides</i>	Asteraceae	Herb	Anti bacterial. Anti fungal properties staunch the blood.

5. CONCLUSION

The present study provides a comprehensive floristic inventory of Balod District, Chhattisgarh, contributing valuable baseline data on angiosperm diversity in a relatively underexplored region of central India. The recorded dominance of plant families such as Fabaceae and Asteraceae reflects their high adaptive capacity and ecological significance in tropical dry deciduous forest ecosystems. The diversity of life forms and the presence of several medicinally and economically important species emphasize the ecological and socio-economic value of the region's plant resources.

The findings highlight the urgent need for effective conservation planning and sustainable utilization of local biodiversity, particularly in view of increasing anthropogenic pressures such as deforestation, agricultural expansion, and overexploitation of forest resources. Integrating community-based conservation approaches with scientific management strategies could play a crucial role in safeguarding plant diversity in the district.

Future research should focus on GIS-based vegetation mapping, quantitative population studies of key and threatened species, and long-term ecological monitoring to assess the impacts of climate change and land-use dynamics on floristic composition. Such efforts will be essential for developing informed conservation policies and ensuring the long-term sustainability of forest ecosystems in Balod District.

REFERENCES

- ❖ Bhogaonkar, P. Y., & Devarkar, V. D. (2014). Ethnobotanical studies of medicinal plants used by tribal communities of Melghat forest, Amravati District, Maharashtra, India. *Journal of Medicinal Plants Studies*, **2**(4), 18–25.
- ❖ Champion, H. G., & Seth, S. K. (1968). *A revised survey of the forest types of India*. Government of India Press, New Delhi.
- ❖ Chen, L., & Wu, J. (2022). Quantitative methods for vegetation analysis and biodiversity assessment in terrestrial ecosystems. *Ecological Indicators*, **136**, 108654. <https://doi.org/10.1016/j.ecolind.2022.108654>
- ❖ Gupta, D. K., & Gupta, G. (2017). Diversity of ethnomedicinal plants in District Balod (Chhattisgarh), India. *IOSR Journal of Pharmacy and Biological Sciences*, **12**(3), 80–89.
- ❖ Hajra, P. K., Nair, V. J., Daniel, P., & Ghosh, S. K. (1996). *Flora of Madhya Pradesh*

(Vols. 1–2). Botanical Survey of India, Calcutta.

- ❖ MoEFCC (Ministry of Environment, Forest and Climate Change). (2020). *India state of forest report 2019*. Forest Survey of India, Dehradun.
- ❖ Sahu, P. K., Sahu, R. K., & Singh, S. (2014). Ethnomedicinal plants used in the healthcare systems of tribes of Dantewada District, Chhattisgarh, India. *American Journal of Plant Sciences*, **5**, 1632–1643. <https://doi.org/10.4236/ajps.2014.511178>
- ❖ Sharma, B. D., Karthikeyan, S., & Singh, N. P. (2004). *Flora of Chhattisgarh*. Botanical Survey of India, Kolkata.
- ❖ The Plant List. (2013). *The Plant List, Version 1.1*. <http://www.theplantlist.org>