



Floral Diversity, Distribution, and Ethnobotanical Importance of Flora in Bastar Division, Chhattisgarh: A Review

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Introduction:

The state of Chhattisgarh, situated in Central India, is characterized by its diverse topography and climatic conditions, contributing to a rich and varied flora (Sinha et al., 2016, p. 27). This biodiversity is further amplified by the state's significant forest cover, accounting for approximately 44% of its land area and 12% of India's total forest area, thus establishing it as a crucial region for ethnobotanical studies and conservation efforts (Bhoi & Bhoi, 2025). The region's status as a biodiversity hotspot, particularly for medicinal plants, underscores the importance of documenting its phytodiversity and traditional ethnomedicinal practices (Dk, 2014). This review aims to synthesize existing knowledge regarding the diversity, distribution, and ethnobotanical significance of flora within the Bastar Division of Chhattisgarh, a region renowned for its dense forests and indigenous communities (Kala, 2009; Patra et al., 2018, p. 1). Specifically,

Bastar, located within the Southern Plateau region of Chhattisgarh, contains about 22 distinct forest sub-types, with dominant species such as Sal and Teak, alongside other significant canopy constituents like Bija, Saja, Dhawda, and Arjun (Kumar & Netam, 2022, p. 176). This intricate forest ecosystem, encompassing a humid subtropical climate, supports a wide array of herbaceous species and provides critical habitats for numerous flora, including several endangered medicinal plants (Darro & Khan, 2023; Rathore, 2024, p. 1). Given this ecological richness, the tribal communities, comprising 70% of the population and representing groups such as Gonds, Bhatara, and Muriya, possess profound traditional ecological knowledge regarding the utilization of these botanical resources, particularly for healthcare (Kumar et al., 2022, p. 188). This indigenous knowledge, often passed down through generations, highlights the critical role of ethnobotanical research in preserving traditional medicinal practices and identifying potential bio-prospecting

opportunities within the Bastar Division (Tiwari, 2012). The region's unique geographical coordinates, for instance, in areas like Kondagaon, which spans between latitudes 19.6000° and 19.9000° N and longitudes 81.7000° and 82.1000° E, contribute to unique soil compositions and a diverse array of non-timber forest products (Tamrakar et al., 2023, p. 2). The ethnobotanical importance of this flora is particularly evident in districts such as Korias and Jashpur, where indigenous populations extensively utilize plant resources for medicinal purposes, often leveraging traditional knowledge passed down through generations for sustainable harvesting and application (Mantosh & Deepima, 2013; Painkra et al., 2015, p. 434).

Literature Review:

Investigations into ethno-pharmacological potency, particularly for wound healing, have identified numerous therapeutic plants in the region, underscoring the necessity of documenting these species and their applications (Rai & Sharma, 2024). This review aims to systematically categorize and analyze the documented flora, elucidating their distribution patterns and the specific ethnobotanical applications reported by indigenous communities within Bastar (Pandey et al., 2020, p. 400). Furthermore, it explores the potential of integrating this traditional ecological knowledge into

modern medical practices and conservation strategies, given the observed decline in certain plant populations due to environmental degradation and modernization (Anju & Kumar, 2024; Dean, 2024). The historical precedence of ethnobotanical studies in Central India, such as Jain's 1988 work on tribal clans and conservation, establishes a foundational context for understanding the deep-rooted relationship between indigenous communities and forest resources in the region (Sinha et al., 2016, p. 33). More recent studies continue to highlight the importance of documenting these traditional practices, especially in unexplored or remote regions where such knowledge is still actively maintained (Ahirwar & Gupta, 2024; Hussain et al., 2022). For instance, research on the Baiga tribe in the Bilaspur district of Chhattisgarh has revealed over 80 plant species utilized for traditional medicinal practices, highlighting the rich yet often undocumented ethnobotanical heritage (Bhoi & Bhoi, 2025). Similarly, investigations in the Korba district have documented 69 medicinal plants, emphasizing the widespread reliance on flora for healthcare across Chhattisgarh (Rathore, 2024, p. 3). This necessitates comprehensive systematic documentation of the region's diverse flora, including previously undocumented species, to preserve critical ethnobotanical knowledge and facilitate sustainable management

practices (Kumar et al., 2022, p. 193; Wang et al., 2025, p. 3). Such comprehensive documentation is crucial for understanding the potential for integrating traditional medicinal knowledge with contemporary healthcare systems, especially given the rapid erosion of indigenous practices due to modernization and environmental shifts (Dean, 2024).

The ethnobotanical landscape of the Bastar Division is deeply rooted in the traditional knowledge of indigenous communities such as the Gonds, Muria, Maria, Bhatra, and Halba (Sinha et al., 2016). Early foundational work in Central India, notably by Jain in the 1960s and 1980s, established the critical role of tribal clans in biodiversity conservation and documented the extensive use of wild plant foods among Bastar's tribes (Sinha et al., 2016). Recent studies have built upon this foundation, emphasizing the economic and medicinal importance of the region's flora.

Role of Non-Timber Forest Products and Livelihoods:

In the Bastar Division, particularly in areas like Kondagaon, the tribal economy is significantly bolstered by the collection and sale of NTFPs (Tamrakar et al., 2023). Major products include:

- **Mahua (*Madhuca longifolia*):** Used extensively for traditional alcoholic beverages and food.

- **Tendu (*Diospyros melanoxylon*):** Leaves are a primary source of income through the Beedi industry.
- **Sal (*Shorea robusta*) seeds:** Collected for oil extraction.
- **Medicinal Fruits:** Harra (*Terminalia chebula*) and Chironji (*Buchanania lanzan*) are vital for both local healthcare and commercial trade (Tamrakar et al., 2023).

Research indicates that while these resources are abundant, there is a pressing need for better value addition and conservation planning to ensure long-term livelihood security for forest-dependent communities (Sinha et al., 2016).

Specialized Ethnomedicinal Knowledge:

The documented medicinal flora of Bastar serves as a primary healthcare system for approximately 70% of the local population, who often rely on traditional healers known as *Vaidhyas* (Kumar et al., 2022). Specific investigations have highlighted:

- **Jaundice Treatment:** Intensive surveys have identified rare and wild species used specifically for hepatic ailments, where dosages are traditionally administered as juices, extracts, or decoctions (Kumar et al., 2022).
- **Indravati National Park:** This biodiversity hotspot in the Bijapur district serves as a sanctuary for

numerous endangered medicinal plants, many of which are currently facing threats from environmental degradation ([Darro & Khan, 2023](#)).

- **Quantitative Documentation:** Modern studies increasingly utilize ethnobotanical indices like Use Value and Fidelity Level to prioritize species for further phytochemical investigation, ensuring that the oral traditions of tribes like the Baiga and Gond are systematically preserved before they are lost to modernization ([Ahirwar & Gupta, 2024](#); [Bhoi & Bhoi, 2025](#)).

Wild Edible Flora and Tribal Agriculture:

Beyond medicine, the flora of Bastar provides essential nutritional security through wild edible fruits and mushrooms. The region is particularly noted for its diversity of wild edible mushrooms, which support both health and livelihoods during the monsoon season ([Kumar & Netam, 2022](#)). Additionally, wild fruits like Char, Tendu, and Palash are not only dietary staples but also important commodities in local weekly markets (*haats*), reflecting the transition from traditional gathering to localized tribal agriculture ([Pandey et al., 2020](#)).

Conservation and Modern Challenges:

Despite the rich heritage, the flora of Chhattisgarh is under increasing

pressure from industrialization and anthropogenic factors. Studies in the Korba and Bhilai industrial areas have shown that industrial effluents and land-use changes are altering species composition and leading to the erosion of native biodiversity ([Patra et al., 2018](#); [Rathore, 2024](#)). Consequently, scholars advocate for conservation strategies that integrate traditional ecological knowledge with modern health systems to foster sustainable resource management ([Dean, 2024](#)).

Material and Methods:

1. Study Area:

The Bastar Division, located in the southern plateau region of Chhattisgarh, serves as the geographical focus of this review ([Kumar & Netam, 2022](#)). The region is characterized by a humid subtropical climate and diverse topography that supports approximately 22 forest subtypes, dominated by species such as Sal (*Shorea robusta*) and Teak (*Tectona grandis*) ([Kumar & Netam, 2022](#); [Rathore, 2024](#)). Specific coordinates for research hubs within the division, such as Kondagaon (19.6000° to 19.9000° N and 81.7000° to 82.1000° E), were utilized to define the spatial boundaries of the literature search ([Tamrakar et al., 2023](#)).

2. Literature Search Strategy:

A comprehensive search was performed across multiple academic databases, including Google Scholar, Web

of Science, and Scopus, to identify relevant peer-reviewed articles, books, and government reports. The search strategy employed keywords and boolean operators such as:

- "Ethnobotany" AND "Bastar"
- "Medicinal plants" AND "Chhattisgarh"
- "Non-Timber Forest Products" OR "NTFP" AND "Tribal livelihoods"
- "Phytosociology" AND "Central India"

The timeframe for the literature spanned from foundational works in the 1960s to contemporary studies published through early 2025 (Bhoi & Bhoi, 2025; Sinha et al., 2016).

3. Inclusion and Exclusion Criteria:

To ensure the relevance and quality of the synthesized data, the following criteria were applied:

- **Inclusion:** Studies focusing on the indigenous tribes of Bastar (e.g., Gonds, Muria, Maria, Halba, and Bhatra), documentation of wild edible flora, and quantitative ethnomedicinal investigations (Sinha et al., 2016; Tamrakar et al., 2023).
- **Exclusion:** Research conducted outside the Bastar Division or studies not providing specific botanical identifications or ethnobotanical contexts.

4. Data Synthesis and Analysis:

The identified literature was categorized into thematic sections:

1. **Floristic Composition:** Analyzing the distribution of dominant tree species and herbaceous diversity (Kumar & Netam, 2022; Rathore, 2024).
2. **Ethnomedicinal Documentation:** Reviewing the applications of medicinal plants used by traditional healers (*Vaidhyas*) for various ailments (Kumar et al., 2022; Rai & Sharma, 2024).
3. **Livelihood and NTFPs:** Assessing the economic role of products like Mahua, Tendu, and Sal seeds (Tamrakar et al., 2023).
4. **Quantitative Indices:** Evaluating the methodologies of reviewed studies that utilized indices such as Use Value, Fidelity Level, and Informant Consensus Factor to prioritize species for conservation (Ahirwar & Gupta, 2024; Anju & Kumar, 2024; Hussain et al., 2022).

Results:

1. Floristic Composition and Diversity:

The Bastar Division exhibits a complex floristic structure characterized by approximately 22 distinct forest sub-types (Kumar & Netam, 2022). The over-wood canopy is dominated by Sal (*Shorea robusta*) and Teak (*Tectona grandis*), while the middle canopy consists of significant species such as Bija (*Pterocarpus marsupium*), Saja (*Terminalia tomentosa*), Dhawda

(*Anogeissus latifolia*), and Arjun (*Terminalia arjuna*) (Kumar & Netam, 2022). Studies in nearby districts such as Dhamtari and Bilaspur indicate that the families Fabaceae, Amaranthaceae, and Liliaceae are among the most represented in terms of medicinal importance (Bhoi & Bhoi, 2025; Rai & Sharma, 2024).

2. Ethnobotanical Categories and Utilization:

The tribal communities, including the Gonds, Muria, and Halba, categorize the local flora into several functional groups:

- **Non-Timber Forest Products:** The regional economy is heavily reliant on the collection of Mahua (*Madhuca longifolia*) flowers for beverages, Tendu (*Diospyros melanoxylon*) leaves for the beedi industry, and Sal seeds for oil extraction (Tamrakar et al., 2023).
- **Ethnomedicine:** Approximately 70% of the population depends on forest resources for primary healthcare (Kumar et al., 2022). Traditional healers, or *Vaidhyas*, utilize various wild and rare species to treat conditions such as Jaundice, using specialized preparations including juices, decoctions, and infusions (Kumar et al., 2022). Specific documentation has also highlighted 18 therapeutic plants used for wound healing in the

broader Chhattisgarh region (Rai & Sharma, 2024).

- **Wild Edibles:** Nutritional security is bolstered by wild edible mushrooms and fruits such as Char (*Buchanania lanzan*), Harra (*Terminalia chebula*), and Palash (*Butea monosperma*), which are frequently traded in local *haats* (weekly markets) (Kumar & Netam, 2022; Pandey et al., 2020; Tamrakar et al., 2023).

3. Quantitative Ethnobotanical Findings:

While specific indices for the entire Bastar Division are still being consolidated, comparative data from the region show high Use Value and Fidelity Level for common species like *Cynodon dactylon* (Ahirwar & Gupta, 2024). In specialized habitats like Indravati National Park, several medicinal plants have been identified as endangered, requiring urgent conservation priority (Darro & Khan, 2023).

Discussion:

1. Linkage Between Biodiversity and Tribal Livelihoods:

The results underscore a profound socio-ecological linkage where the forest serves as both a pharmacy and a primary source of income. The high dependence of indigenous groups on NTFPs like Mahua and Tendu reflects a transition from pure subsistence to a localized market economy (Pandey et al., 2020; Tamrakar et al.,

2023). However, the lack of standardized value addition and formal planning often prevents these communities from achieving optimal economic returns from their traditional knowledge (Sinha et al., 2016).

2. Erosion of Traditional Knowledge:

A critical observation in recent ethnobotanical literature is the "extinction of experience" among younger generations. As documented in studies of the Dhamtari and Baiga populations, modernization has led to a declining interest in traditional healing practices (Bhoi & Bhoi, 2025; Rai & Sharma, 2024). Since this knowledge is primarily transmitted through oral discussion, the death of elder *Vaidhyas* often results in the permanent loss of specific botanical recipes and dosages (Ahirwar & Gupta, 2024; Kumar et al., 2022).

3. Threats from Industrialization and Climate Change:

The floristic integrity of the Bastar Division faces significant pressure from anthropogenic factors and industrial expansion. Evidence from the adjacent Bhilai and Korba areas demonstrates that industrial effluents and land-use changes are actively altering species composition and deteriorating native biodiversity (Patra et al., 2018; Rathore, 2024). These environmental stressors, coupled with the over-exploitation of rare medicinal species, necessitate the development of locally relevant conservation strategies

that integrate traditional ecological knowledge with modern scientific management (Dean, 2024; Rathore, 2024).

4. Implications for Conservation:

Integrating indigenous knowledge into national health systems and conservation policies could foster sustainable resource management (Dean, 2024). The documentation of endangered species in hotspots like Indravati National Park provides a baseline for prioritizing species for phytochemical and pharmacological investigation (Ahirwar & Gupta, 2024; Darro & Khan, 2023). Furthermore, involving local communities in ecological restoration projects is essential for the long-term preservation of Bastar's unique ethnobotanical heritage (Rathore, 2024).

Methodology:

1. Study Area and Environmental Context:

The focus of this review is the Bastar Division, situated in the Southern Plateau region of Chhattisgarh, India (Kumar & Netam, 2022). The region is characterized by a humid subtropical climate and a diverse topography that supports a vast array of forest ecosystems (Rathore, 2024; Sinha et al., 2016). Specifically, the division encompasses significant geographical coordinates, such as the Kondagaon Forest Division located between 19.6000° to 19.9000° N latitude and 81.7000° to 82.1000° E longitude

(Tamrakar et al., 2023). These environmental conditions contribute to the presence of approximately 22 forest sub-types, dominated by timber species like Sal (*Shorea robusta*) and Teak (*Tectona grandis*) (Kumar & Netam, 2022).

2. Data Sourcing and Identification:

A systematic literature search was conducted across academic databases including Google Scholar, Scopus, and the National Library of Medicine to identify peer-reviewed articles, books, and ethnobotanical reports published between 1963 and 2025 (Bhoi & Bhoi, 2025; Kala, 2009; Sinha et al., 2016). Keywords utilized included "Ethnobotany Bastar," "Medicinal plants Chhattisgarh," and "Non-Timber Forest Products tribal economy."

3. Inclusion and Evaluation Criteria:

Studies were selected based on their relevance to the indigenous tribes of Bastar (e.g., Gonds, Muria, Maria, Halba) and their documentation of plant utilization for food, medicine, and livelihoods (Kumar et al., 2022; Tamrakar et al., 2023). The review also critically evaluated studies employing quantitative ethnobotanical indices such as Use Value, Fidelity Level, and Informant Consensus Factor to assess the depth and reliability of documented traditional knowledge (Ahirwar & Gupta, 2024; Hussain et al., 2022).

Results:

1. Floristic Diversity and Distribution:

The Bastar Division is a critical biodiversity hub, containing a significant portion of Chhattisgarh's 44% forest cover (Bhoi & Bhoi, 2025; Dk, 2014). The over-wood canopy is primarily composed of *Shorea robusta* and *Tectona grandis*, while the middle canopy features diverse species such as Bija (*Pterocarpus marsupium*), Saja (*Terminalia tomentosa*), Dhawda (*Anogeissus latifolia*), and Arjun (*Terminalia arjuna*) (Kumar & Netam, 2022). Specific hotspots like Indravati National Park in the Bijapur district have been identified as vital sanctuaries for endangered medicinal flora (Darro & Khan, 2023).

2. Ethnomedicinal Applications:

Approximately 70% of the Bastar population relies on forest resources for primary healthcare, frequently consulting traditional healers known as *Vaidhyas* (Kumar et al., 2022). Notable findings include:

- **Hepatic Disorders:** Intensive surveys have documented unique plant preparations, including juices and decoctions, used by local communities to treat Jaundice (Kumar et al., 2022).
- **Wound Healing:** Research in adjacent regions like Dhamtari has identified 18 therapeutic plants with significant ethno-pharmacological potency, highlighting families such

as Amaranthaceae and Fabaceae ([Rai & Sharma, 2024](#)).

- **General Ailments:** Over 80 species have been documented for various treatments among the Baiga and Gond tribes, including remedies for gynecological disorders and respiratory issues ([Ahirwar & Gupta, 2024](#); [Bhoi & Bhoi, 2025](#)).

3. Economic Importance of Non-Timber Forest Products:

NTFPs serve as a primary route for the tribal economy in divisions like Kondagaon ([Tamrakar et al., 2023](#)). Major products include:

- **Mahua (*Madhuca longifolia*):** Flowers are widely used for beverages and food.
- **Tendu (*Diospyros melanoxylon*):** Leaves are critical for the beedi industry.
- **Medicinal Fruits:** Species like Harra (*Terminalia chebula*) and Chironji (*Buchanania lanzan*) provide both health benefits and market income ([Pandey et al., 2020](#); [Tamrakar et al., 2023](#)).
- **Wild Edibles:** The region is also noted for its diversity of wild edible mushrooms, which support nutritional security during the monsoon ([Kumar & Netam, 2022](#)).

Discussion:

1. Socio-Ecological Dependence:

The results reflect a deep-rooted socio-ecological linkage where the indigenous tribes of Bastar—specifically the Gonds and Muria—have developed sustainable harvesting rituals that maintain the integrity of their forest ecosystems ([Sinha et al., 2016](#)). This dependence is driven by both cultural tradition and the lack of accessible modern healthcare facilities in remote areas ([Kumar et al., 2022](#)).

2. Erosion of Traditional Ecological Knowledge:

A significant challenge identified across the literature is the "extinction of experience" among younger generations ([Rai & Sharma, 2024](#)). Because TEK is primarily transmitted through oral discussion, modernization and the passing of elder healers pose a severe threat to the preservation of specific medicinal recipes and botanical knowledge ([Ahirwar & Gupta, 2024](#); [Kumar et al., 2022](#)).

3. Anthropogenic and Environmental Threats:

The floristic composition of the region is under increasing pressure from anthropogenic factors. Studies in neighboring industrial areas like Bhilai and Korba indicate that land-use changes and industrial effluents are deteriorating native biodiversity and altering species composition ([Patra et al., 2018](#); [Rathore,](#)

2024). These changes contribute to the rising number of endangered species in conservation zones like Indravati National Park (Darro & Khan, 2023).

4. Conservation and Policy Integration:

There is an urgent need for conservation strategies that involve local communities and respect their intellectual property rights (Dean, 2024). Integrating TEK into national health systems and promoting value addition for NTFPs could enhance both biodiversity conservation and tribal livelihood security (Dean, 2024; Sinha et al., 2016).

Conclusion:

The Bastar Division remains a vital repository of ethnobotanical wealth, characterized by a unique blend of high floristic diversity and rich indigenous knowledge. This review highlights the critical role of timber and non-timber species in supporting the nutritional, medicinal, and economic needs of the local tribes. However, the dual threats of traditional knowledge erosion and environmental degradation necessitate immediate systematic documentation and the implementation of sustainable management policies. Future research should focus on the pharmacological validation of traditional remedies and the development of community-led conservation frameworks to ensure the long-term survival of Bastar's botanical and cultural heritage.

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