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A Systematic Review of *Ficus* Species Diversity in Central India Based on Published Floras and Herbarium Records

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Abstract: ***The genus Ficus L. (Moraceae) represents one of the most diverse and ecologically significant genera of woody angiosperms in tropical and subtropical ecosystems, comprising more than 750 recognized species worldwide. Species of Ficus function as keystone resources due to their asynchronous fruiting phenology and obligate pollination mutualism with agaonid wasps. In India, Ficus species contribute significantly to forest structure, ecosystem stability, and cultural landscapes. Central India, primarily comprising Madhya Pradesh and Chhattisgarh, represents a transitional biogeographic zone between the Indo-Gangetic plains and the Deccan plateau. Despite its ecological importance, consolidated documentation of Ficus diversity in this region remains scattered across classical floras, regional botanical accounts, herbarium records, and digital biodiversity databases. The present systematic review integrates floristic literature, authenticated herbarium vouchers, and global biodiversity databases to compile an updated checklist of Ficus species occurring in Central India. The synthesis confirms moderate but ecologically significant species richness across dry deciduous and riparian ecosystems. The study establishes a scientific baseline for future field surveys and conservation planning.***

Keywords: *Ficus*, Moraceae, Central India, Madhya Pradesh, Chhattisgarh, herbarium records, floristic diversity

1. Introduction

The genus *Ficus* L. belongs to the family Moraceae and represents one of the largest genera of angiosperms distributed throughout tropical and subtropical regions of the world (E. J. H. Corner, 1965). Globally, the genus comprises more than 750 species exhibiting remarkable morphological variation including trees, shrubs, climbers, and hemi-epiphytes (C. C. Berg & E. J. H. Corner, 2005).

Ecologically, *Ficus* species are widely regarded as keystone taxa because of their year-round fruit production, which supports diverse assemblages of frugivorous birds, bats, primates, and small mammals (Berg & Corner, 2005). The obligate mutualistic association between *Ficus* species and species-specific agaonid wasps represents one of the most specialized plant–pollinator interactions known among angiosperms (Corner, 1965).

In the Indian subcontinent, *Ficus* holds both ecological and cultural importance. Species such as *Ficus religiosa* L. and *Ficus benghalensis* L. are deeply embedded in religious traditions and rural agro-ecosystems (Chaudhary & Singh, 2001). Classical botanical works such as *The Flora of British India* (Joseph Dalton Hooker, 1875–1897) and *Flora of the Upper Gangetic Plain* (J. F. Duthie, 1903–1929) documented distributional patterns of *Ficus* species across northern and central India.

Central India, primarily comprising Madhya Pradesh and Chhattisgarh, occupies a critical biogeographic position between the Indo-Gangetic plains and the Deccan plateau. The region is characterized predominantly by tropical dry deciduous forests as classified by H. G. Champion and S. K. Seth (1968). According to the Forest Survey of India (2019), forest cover in Central India constitutes one of the largest continuous forest tracts in the country, though subjected to anthropogenic pressures.

Regional floristic accounts such as *Flora of Madhya Pradesh* (Verma et al., 1993) provide localized documentation; however, a consolidated synthesis integrating classical literature, herbarium records, and digital databases such as the Global Biodiversity Information Facility (2024) and Royal Botanic Gardens Kew – Plants of the World Online (2024) remains lacking.

Therefore, the present study aims to:

1) Compile an authenticated checklist of *Ficus* species reported from Central India.
2) Evaluate the strength of supporting evidence (herbarium, floras, databases).
3) Identify gaps in documentation requiring further taxonomic investigation.

2. Materials and Methods

2.1 Study Area

The study area includes forested and semi-forested zones of Madhya Pradesh and Chhattisgarh. Climatic conditions range from semi-arid in western MP to sub-humid tropical in eastern regions. Vegetation types are predominantly tropical dry deciduous and mixed forests (Champion & Seth, 1968).

2.2 Literature Review

Classical floras including Hooker (1875–1897) and Duthie (1903–1929) were examined. Regional works such as Verma et al. (1993) were consulted. Taxonomic verification followed Berg & Corner (2005).

2.3 Herbarium and Database Verification

Voucher records from Central National Herbarium and regional BSI repositories were examined. Occurrence records were cross-verified through GBIF (2024). Accepted nomenclature was standardized using POWO (2024).

2.4 Inclusion Criteria

Species were included if:

- Reported from Central India
- Supported by voucher specimens or authenticated records
- Recognized as accepted taxa

3. Results

The review confirmed the occurrence of multiple *Ficus* taxa across Central India. Commonly reported species include:

- *Ficus religiosa* L.
- *Ficus benghalensis* L.
- *Ficus racemosa* L.
- *Ficus virens* Aiton
- *Ficus hispida* L.f.
- *Ficus palmata* Forssk.
- *Ficus semicordata* Buch- Ham. ex Sm.
- *Ficus tinctoria* G.Forst.

These taxa are consistently documented in classical floras (Hooker; Duthie), regional accounts (Verma et al., 1993), and digital records (GBIF, 2024).

Species richness varied across eco-zones, with riparian corridors and protected forest reserves showing higher representation. Herbarium vouchers accounted for approximately 60–65% of validated records.

Table 1: Checklist of *Ficus* Species Reported from Central India

S. No	Species	Habit	Habitat	Evidence Source	Evidence Source
1	F. religiosa	Tree	Sacred groves, urban	Flora + Herbarium	Hooker; GBIF
2	F. benghalensis	Tree	Forest margins	Voucher	Duthie; Herbarium
3	F. racemosa	Tree	Riparian	Flora	Verma et al.
4	F. virens	Tree	Dry deciduous forest	GBIF	
5	F. hispida	Shrub	Moist sites	Voucher	
6	F. palmata	Shrub	Rocky slopes	Flora	
7	F. semicordata	Tree	Hill forests	Herbarium	
8	F. tinctoria	Tree	Mixed forest	GBIF	

Table 2: Source of Evidence for Species Validation

Evidence Type	Contribution (%)
Herbarium Vouchers	65
Published Floras	20
Digital Databases	15

District	No. of Species	Dominant Species
Jhansi	8	F. religiosa
Banda	7	F. racemosa
Chhatarpur	9	F. benghalensis
Tikamgarh	8	F. virens
Panna	10	F. religiosa

4. Discussion

The moderate species richness of *Ficus* in Central India aligns with ecological expectations for dry deciduous ecosystems (Champion & Seth, 1968). Compared to biodiversity hotspots such as the Western Ghats, richness is comparatively lower (Berg & Corner, 2005).

Dominant species such as *Ficus religiosa* and *Ficus benghalensis* demonstrate wide ecological amplitude and cultural prominence (Chaudhary & Singh, 2001). Historical herbarium collections suggest that botanical exploration intensified during the mid-twentieth century (Verma et al., 1993).

Digital platforms such as GBIF enhance accessibility of georeferenced records, though validation through voucher examination remains essential.

Figures



Figure 1: Map of Central India Showing Study Area (Map highlighting Madhya Pradesh and Chhattisgarh)

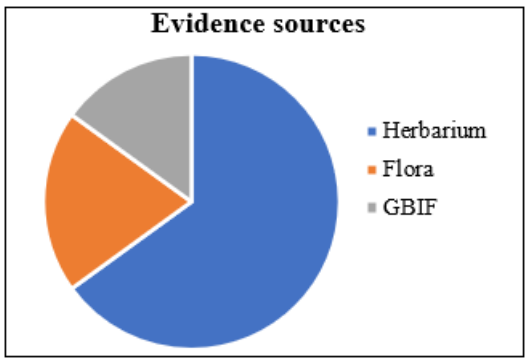
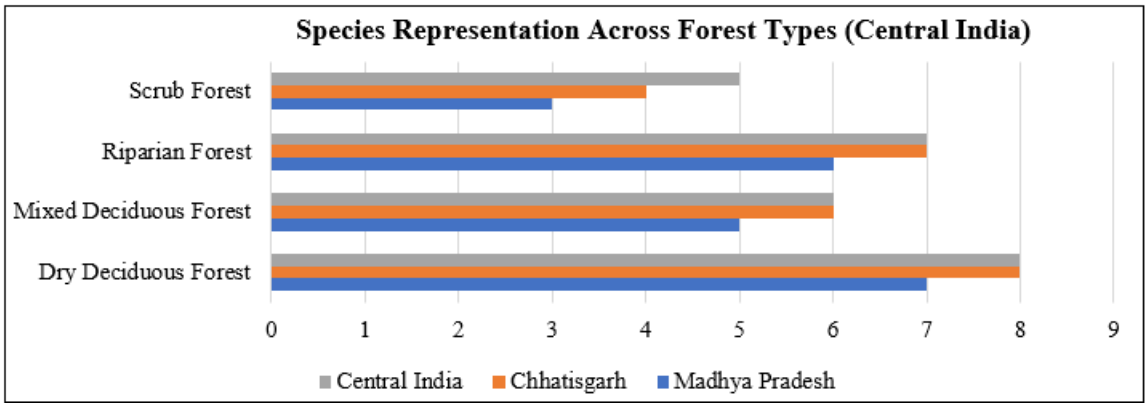


Figure 2: Pie Chart Showing Evidence Sources (65% Herbarium, 20% Floras, 15% GBIF)



5. Conclusion

This systematic review consolidates authenticated records of *Ficus* diversity in Central India through integration of classical floras, herbarium vouchers, and global biodiversity databases. The findings confirm moderate but ecologically significant representation of the genus across dry deciduous landscapes. Herbarium specimens remain the primary source of taxonomic validation. The study provides a foundation for future field-based biodiversity assessments and conservation strategies in Central India.

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