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Ethnobotanical Study of Ritual Plants in Telangana Festivals

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ABSTRACT

Ritual plants are integral to the cultural and spiritual traditions of Telangana, India, where festivals blend traditional knowledge, seasonal rhythms, and sacred beliefs. This ethnobotanical study documents ritual flora used in major festivals—Bathukamma, Bonalu, Sammakka-Saralamma Jatara, Nagula Chavithi, Sankranti, and Vinayaka Chavithi—highlighting their cultural roles and conservation needs. Fieldwork conducted from October 2023 to March 2025 across eight districts involved 146 informants, festival observations, and market surveys. A total of 83 species belonging to 76 genera and 36 families were recorded. Herbs dominated (46.99%), followed by trees (25.30%), shrubs (16.87%), and climbers (10.84%). The most represented families were Fabaceae (12.05%), Lamiaceae (8.43%), Asteraceae (7.23%), and Solanaceae (7.23%). Key culturally important species included *Curcuma longa* (UV: 0.87, CI: 0.76), *Ocimum sanctum* (UV: 0.81, CI: 0.72), *Cassia fistula* (UV: 0.66, CI: 0.64), *Azadirachta indica* (UV: 0.61, CI: 0.60), and *Phyllanthus emblica* (UV: 0.55, CI: 0.53). Conservation assessment based on the 2024 IUCN Red List revealed 8 species threatened by overharvesting, habitat loss, and market pressures. The study underscores women's role in safeguarding ritual plant knowledge and advocates community-led conservation, educational integration, and alignment with UNESCO, CBD and SDG goals (11&15) to protect biodiversity and biocultural heritage.

Keywords: *Ethnobotany; Ritual plants; Telangana festivals; Biocultural diversity; Use Value (UV); Cultural Importance Index (CI); Conservation; Traditional ecological knowledge; Sacred groves; Intangible cultural heritage*

1. Introduction

Ethnobotany is a multidisciplinary science that examines the complex interactions between people and plants within their socio-cultural, spiritual, and ecological contexts. In India, where nature is deeply revered and ritualized, plant-based traditions form a fundamental part of daily life, particularly during religious and seasonal festivals. Telangana, a state formed in 2014 after bifurcation from Andhra Pradesh, possesses unique agroclimatic zones, ranging from the dry deciduous forests of the Deccan plateau to the riverine ecosystems of the Godavari basin. These diverse ecological zones host a rich variety of plant species that are intricately woven into local customs and religious celebrations. Pioneering works like Jain (1991) [1] laid the foundation for ethnobotanical studies in India, emphasizing the need for documentation of folk traditions.

While significant ethnobotanical studies have been conducted in southern India, particularly in Tamil Nadu and Kerala [2,3,11] comprehensive documentation focused specifically on Telangana's ritual flora remains limited. Given the increasing erosion of traditional ecological knowledge due to modernization, urbanization, and generational gaps, it is imperative to record and preserve this biocultural heritage [9, 12, 13, 10].

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Objectives of the Study:

- To conduct a systematic inventory of plant species used in key Telangana festivals.
- To quantify the cultural significance of these species using ethnobotanical indices.
- To assess the conservation status of ritual plants through scientific and local knowledge.
- To propose sustainable management strategies to protect and revitalize biocultural diversity.

These objectives align with international frameworks such as the Convention on Biological Diversity (CBD), the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage (2003), and the Sustainable Development Goals (SDGs 11 and 15) [7,15,17].

2. Materials and Methods

2.1 Study Area

Telangana, located in south-central India between 15°46' and 19°47' N latitude, spans a diverse physiographic region with a semi-arid to sub-humid climate. The annual average rainfall is approximately 905 mm, primarily from the southwest monsoon. The selected districts—Hyderabad, Medchal–Malkajgiri, Warangal, Jangaon, Khammam, Nalgonda, and Mahabubnagar—represent varied socio-cultural and ecological zones, each known for distinct regional festival practices.

2.2 Data Collection

A mixed-methods approach was employed:

- Ethnographic Surveys: 146 informants (93 women, 53 men), aged 23 to 82, were purposively selected for interviews. Informants included tribal elders, flower vendors, homemakers, temple priests, and folk healers.
- Participatory Observation: Direct participation in festivals over two annual cycles (2023–2025) enabled first-hand observation and recording.
- Voucher Specimen Collection: Botanical samples were identified with expert help and stored at the GDCW Begumpet Herbarium under accession numbers GDCWBH-BATH 001–086.

2.3 Quantitative Indices

- Use Value (UV): Calculated as $UV = \Sigma Ui / N$, where Ui = uses mentioned by an informant, N = total informants.
- Cultural Importance Index (CI): $CI = \Sigma(UR/N)$, where UR = use reports per species per event. CI reflects frequency and diversity of use.

2.4 Conservation Assessment

Species status was cross-verified with the IUCN Red List 2024. Additionally, community perception was gauged using a 5-point Likert scale (1 = very abundant, 5 = very rare). Species with high ritual demand and low perceived abundance (Likert ≥ 4) were flagged for priority conservation.

3. Results

3.1 Species Diversity

A total of 83 plant species belonging to 76 genera and 36 families were recorded across the study regions. Life-form analysis revealed that:

- Herbs accounted for 39 species (46.99%)
- Shrubs: 14 species (16.87%)
- Trees: 21 species (25.30%)
- Climbers: 9 species (10.84%)

This indicates a strong community preference for herbaceous and accessible species, especially during floral-based rituals like Bathukamma.

3.1.1 Dominant Families

- Fabaceae: 10 species (12.05%)
- Lamiaceae: 7 species (8.43%)
- Asteraceae & Solanaceae: 6 species each (7.23%)

These families are well-represented due to their ecological abundance and symbolic value in rituals [18, 25].

3.2 Festival-wise Plant Usage

Each major festival in Telangana is associated with a unique set of plant species and ritual meanings:

- Bathukamma: A floral festival dedicated to goddess Gauri, featuring *Celosia argentea*, *Cassia fistula*, *Tridax procumbens*, and *Cucurbita maxima* blossoms. These flowers symbolize fertility, healing, and reverence for nature [18, 21].
- Bonalu: Celebrated for goddess Mahakali, involving offerings of *Azadirachta indica* (neem), *Curcuma longa* (turmeric), *Emilia sonchifolia*, and *Datura metel*. These are believed to protect from evil and purify the space [21, 22, 9].
- Sammakka–Saralamma Jatara: This tribal festival honors ancestral deities using forest species like *Butea monosperma*, *Terminalia arjuna*, *Saccharum officinarum* and *Phyllanthus emblica [20, 25]*.
- Nagula Chavithi: Serpent worship rituals include *Abrus precatorius*, *Tinospora cordifolia*, *Cuscuta reflexa*, and *Ficus benghalensis* which are believed to offer protection, fertility, and connection to ancestral spirits. These ritual practices reflect ancient ecological reverence tied to serpent symbolism. [4,13, 22,23].
- Sankranti: A harvest festival where homes are adorned with *Ziziphus mauritiana*, *Saccharum officinarum*, and *Cynodon dactylon*, signifying prosperity and thanksgiving [22,3,8].
- Vinayaka Chavithi: Celebrated for Lord Ganesha with offerings of 21 sacred leaves (patri), including *Ocimum tenuiflorum*, *Calotropis gigantea*, *Aegle marmelos* - a plant deeply rooted in both medicinal and spiritual traditions [5], *Cynodon dactylon*, and *Ipomoea alba* [23].

3.3 Quantitative Indices

Quantitative analysis of plant importance was based on Use Value (UV) and Cultural Importance Index (CI) [24]. The top culturally valued species are listed below:

Table 1. Top Culturally Valued Plant Species Used in Telangana Festivals

Rank	Species	UV	CI	Key Festivals	Remarks
1	*Curcuma longa*	0.87	0.76	Bonalu, Nagula Chavithi	Central to rituals of purity and protection
2	*Ocimum tenuiflorum*	0.81	0.72	Bathukamma, Sankranti	Holy basil used widely in daily worship
3	*Cassia fistula*	0.66	0.64	Bathukamma	Bright yellow flowers in festive arrangements
4	*Azadirachta indica*	0.61	0.60	Bonalu, Ugadi	Antiseptic, protective sacred tree
5	*Phyllanthus emblica*	0.55	0.53	Sammakka Jatara	Health and vitality; used in rituals

Additional culturally important species (UV/CI not computed): *Cynodon dactylon*, *Aegle marmelos*, *Calotropis gigantea*, *Butea monosperma*, *Tagetes erecta*, *Ziziphus mauritiana*, and others.

3.4 Conservation Status

Cross-referencing species with the IUCN Red List (2024) revealed [16]:

- *Pterocarpus santalinus* – EN (Endangered, IUCN)
- *Boswellia serrata* – NT (Near Threatened)
- *Leucas aspera* – NE (Not Evaluated globally, but locally rare due to overharvesting)
- *Cassia fistula* – LC (IUCN), locally declining
- *Erythrina indica* – LC, locally declining from habitat loss
- *Phyllanthus emblica* – LC, high market extraction
- *Azadirachta indica* – LC, affected by urban expansion
- *Ziziphus mauritiana* – LC, threatened by habitat conversion

Additionally, 8 species were identified by communities as facing local scarcity due to urbanization and overharvesting. These include:

- *Celosia argentea*
- *Cassia fistula*
- *Curcuma longa*
- *Ocimum tenuiflorum*
- *Tinospora cordifolia*
- *Phyllanthus emblica*
- *Evolvulus alsinoides*
- *Aegle marmelos*

This highlights the need for conservation strategies such as domestication, sustainable harvesting, and community gardens to protect [13,14] Telangana's ritual plant biodiversity.

4. Discussion

The findings of this study underscore the profound interconnection between biodiversity and cultural practices in Telangana. The ritual use of 86 plant species across six major festivals reveals a dynamic repository of traditional ecological knowledge that has been orally transmitted through generations, particularly by women and tribal communities. The dominance of herbs and flowering plants in Bathukamma and Bonalu reflects an aesthetic, medicinal, and symbolic preference, reinforcing the cultural and ecological relevance of these life forms. Bonalu reflects a syncretic blend of health, protection, and spiritual purification through plants like neem and turmeric, whose medicinal roles are recognized in both traditional and modern contexts.8]

The UV and CI values indicate that species such as *Curcuma longa*, *Ocimum tenuiflorum*, and *Cassia fistula* are not only frequently used but hold multifaceted cultural symbolism, ranging from purification and protection to fertility and renewal. These species are central to the ritual ethos of the region, appearing in multiple festivals with diverse applications.

Importantly, the overlap of high UV/CI species with those facing local scarcity highlights an urgent conservation concern [6,8]. This convergence calls for the integration of cultural plant knowledge into conservation frameworks. Ritual-driven demand, particularly during peak festival seasons, places pressure on wild populations, as seen with *Tinospora cordifolia*, *Celosia argentea*, and *Phyllanthus emblica*.

The study also affirms the pivotal role of women as custodians of ritual plant traditions. In festivals like Bathukamma and Bonalu, women not only select and arrange flowers but also transmit cultural stories and ecological knowledge embedded in these practices. Engaging women in conservation planning and biodiversity education can enhance the sustainability of these traditions [13,4].

Furthermore, linking ethnobotanical traditions to school and college curricula can serve a dual purpose—preserving cultural heritage while fostering environmental stewardship among youth [17, 7, 13]. Such integration supports SDG 11 (Sustainable Cities and Communities) by reinforcing local cultural identity, and SDG 15 (Life on Land) by promoting sustainable use of terrestrial ecosystems.

The results advocate for policies that recognize and promote sacred and ritual landscapes as bio-cultural sanctuaries especially in Telangana, where sacred groves are traditional custodians of ritual plant diversity [19]. Community-led cultivation of culturally significant and threatened plants, establishment of ritual gardens, and incentivizing traditional festivals as eco-educational tools are recommended strategies to sustain both biodiversity and cultural identity in Telangana.

5. Conclusion

This study presents a comprehensive ethnobotanical account of ritual plant usage in Telangana's major festivals, illuminating the complex interplay between biodiversity, spirituality, and traditional ecological knowledge. The findings highlight the richness of ritual plant diversity, with 86 documented species, many of which are integral to the socio-cultural identity of the region. The use of quantitative indices such as Use Value (UV) and Cultural Importance Index (CI) provided a measurable understanding of the plants most valued by communities.

The research underscores the urgency of conserving culturally important plants that are increasingly under threat from urbanization, overharvesting, and ecological degradation. In particular, species like *Curcuma longa*, *Ocimum tenuiflorum*, and *Phyllanthus emblica* not only hold significant ritual value but also face mounting conservation challenges.

Recognizing the role of women and elders in preserving and transmitting ritual plant knowledge is vital. Their participation should be central to any conservation or educational initiative. The study recommends that policymakers, educators, and conservationists collaborate to integrate this biocultural knowledge into local educational curricula, promote sacred groves and ritual gardens, and support community-based conservation strategies.

In conclusion, safeguarding ritual plant knowledge and practices not only contributes to biodiversity conservation but also reinforces Telangana's intangible cultural heritage. Preserving these traditions is crucial to achieving both environmental sustainability and cultural resilience in the face of rapid socio-economic change.

Table 2. Ritual Plants Used in Telangana Festivals and their IUCN conservation status

No	Botanical Name	Family	Parts Used	Festivals Used In	IUCN Status
1.	*Abrus precatorius*	Fabaceae	Seeds, Leaves	Nagula Chavithi	LC
2.	*Achyranthes aspera*	Amaranthaceae	Whole Plant	Bonalu Vinayaka Chavithi	LC
3.	*Aegle marmelos*	Rutaceae	Leaves, Fruit	Vinayaka Chavithi, Sankranti	LC
4.	*Aerva lanata*	Amaranthaceae	Flowers	Bathukamma	LC
5.	*Alternanthera sessilis*	Amaranthaceae	Leaves	Bathukamma	LC
6.	*Andrographis paniculata*	Acanthaceae	Leaves	Bonalu	LC
7.	*Argemone mexicana*	Papaveraceae	Latex, Flowers	Bathukamma	LC
8.	*Azadirachta indica*	Meliaceae	Leaves, Twigs	Bonalu, Ugadi	LC
9.	*Bambusa vulgaris*	Poaceae	Culms	Sankranti	LC
10.	*Barleria prionitis*	Acanthaceae	Flowers	Bathukamma	LC
11.	*Boerhavia diffusa*	Nyctaginaceae	Whole Plant	Bathukamma	LC
12.	*Boswellia serrata*	Burseraceae	Resin	Ugadi	NT
13.	*Butea monosperma*	Fabaceae	Flowers	Sammakka Jatara	LC

14.	*Calotropis gigantea*	Apocynaceae	Leaves, Flowers	Vinayaka Chavithi, Bonalu	LC
15.	*Capsicum annuum*	Solanaceae	Fruits	Sankranti	LC
16.	*Cassia fistula*	Fabaceae	Flowers	Bathukamma	LC
17.	*Celosia argentea*	Amaranthaceae	Flowers	Bathukamma	LC
18.	*Centella asiatica*	Apiaceae	Leaves	Nagula Chavithi	LC
19.	*Citrus aurantium*	Rutaceae	Leaves	Bathukamma	LC
20.	*Clerodendrum inerme*	Lamiaceae	Leaves	Bonalu	LC
21.	*Coccinia grandis*	Cucurbitaceae	Leaves	Bonalu	LC
22.	*Coriandrum sativum*	Apiaceae	Leaves, Seeds	Sankranti	LC
23.	*Costus speciosus*	Costaceae	Rhizome	Bathukamma	LC
24.	*Crotalaria juncea*	Fabaceae	Whole Plant	Bathukamma	LC
25.	*Cucurbita maxima*	Cucurbitaceae	Flowers	Bathukamma	LC
26.	*Curcuma longa*	Zingiberaceae	Rhizome	Nagula Chavithi Bonalu	LC
27.	*Cuscuta reflexa*	Convolvulaceae	Stems	Nagula Chavithi	LC
28.	*Cynodon dactylon*	Poaceae	Blades (Grass)	Vinayaka Chavithi, Sankranti	LC
29.	*Datura metel*	Solanaceae	Flowers, Seeds	Bonalu Vinayaka Chavithi	LC
30.	*Desmodium gangeticum*	Fabaceae	Root, Leaves	Sammakka Jatara	LC
31.	*Eclipta prostrata*	Asteraceae	Whole Plant	Bathukamma	LC
32.	*Emilia sonchifolia*	Asteraceae	Flowers	Bonalu	LC
33.	*Ficus benghalensis*	Moraceae	Aerial Roots	Nagula Chavithi	LC
34.	*Ficus religiosa*	Moraceae	Leaves	Ugadi Vinayaka Chavithi	LC
35.	*Gossypium herbaceum*	Malvaceae	Flowers, Boll	Bathukamma	LC
36.	*Helicteres isora*	Malvaceae	Pods	Bathukamma	LC
37.	*Hibiscus rosa-sinensis*	Malvaceae	Flowers	Bathukamma	LC
38.	*Ipomoea carnea*	Convolvulaceae	Flowers	Bonalu	LC
39.	*Jasminum sambac*	Oleaceae	Flowers	Bathukamma, Bonalu	LC
40.	*Lawsonia inermis*	Lythraceae	Leaves	Bonalu	LC
41.	*Leucas aspera*	Lamiaceae	Leaves	Bathukamma	NE
42.	*Mangifera indica*	Anacardiaceae	Leaves	Sankranti Vinayaka Chavithi	LC
43.	*Maranta arundinacea*	Marantaceae	Rhizome	Sankranti	LC
44.	*Mentha arvensis*	Lamiaceae	Leaves	Bathukamma	LC
45.	*Mimosa pudica*	Fabaceae	Whole Plant	Bathukamma	LC
46.	*Moringa oleifera*	Moringaceae	Leaves, Flowers	Sankranti	LC
47.	*Murraya koenigii*	Rutaceae	Leaves	Sankranti	LC
48.	*Nerium oleander*	Apocynaceae	Flowers	Bonalu, Vinayaka Chavithi	LC
49.	*Ocimum sanctum*	Lamiaceae	Leaves	Vinayaka Chavithi, Bathukamma, Sankranti	LC
50.	*Pedalium murex*	Pedaliaceae	Whole Plant	Bonalu	LC
51.	*Phyllanthus amarus*	Phyllanthaceae	Whole Plant	Nagula Chavithi	LC
52.	*Phyllanthus emblica*	Phyllanthaceae	Fruits, Leaves	Sammakka Jatara	LC
53.	*Piper betle*	Piperaceae	Leaves	Sankranti	LC

54.	*Plumbago zeylanica*	Plumbaginaceae	Root	Bathukamma	LC
55.	*Pterocarpus santalinus*	Fabaceae	Heartwood	Ugadi, Jatara	EN
56.	*Ricinus communis*	Euphorbiaceae	Leaves, Seeds	Bonalu	LC
57.	*Rosa indica*	Rosaceae	Flowers	Bathukamma	LC
58.	*Saccharum officinarum*	Poaceae	Stalks	Sankranti	LC
59.	*Senna auriculata*	Fabaceae	Flowers	Bathukamma	LC
60.	*Sesamum indicum*	Pedaliaceae	Seeds	Sankranti	LC
61.	*Solanum trilobatum*	Solanaceae	Leaves	Bathukamma	LC
62.	*Solanum xanthocarpum*	Solanaceae	Fruits, Leaves	Bonalu Vinayaka Chavithi	LC
63.	*Syzygium cumini*	Myrtaceae	Leaves	Bathukamma	LC
64.	*Tagetes erecta*	Asteraceae	Flowers	Bonalu, Bathukamma	LC
65.	*Terminalia arjuna*	Combretaceae	Bark	Sammakka Jatara Vinayaka Chavithi	LC
66.	*Tinospora cordifolia*	Menispermaceae	Stem	Nagula Chavithi	LC
67.	*Tridax procumbens*	Asteraceae	Flowers	Bathukamma	LC
68.	*Vernonia cinerea*	Asteraceae	Whole Plant	Bathukamma	LC
69.	*Vitex negundo*	Lamiaceae	Leaves	Bonalu Vinayaka Chavithi	LC
70.	*Withania somnifera*	Solanaceae	Roots	Bathukamma	LC
71.	*Zingiber officinale*	Zingiberaceae	Rhizome	Sankranti	LC
72.	*Ziziphus jujuba*	Rhamnaceae	Fruits, Leaves	Sankranti Vinayaka Chavithi	LC
73.	*Ziziphus mauritiana*	Rhamnaceae	Fruits	Sankranti	LC
74.	*Erythrina indica*	Fabaceae	Leaves	Vinayaka Chavithi	LC
75.	*Ocimum basilicum*	Lamiaceae	Leaves	Vinayaka Chavithi	LC
76.	*Prosopis cineraria*	Fabaceae	Leaves	Vinayaka Chavithi	LC
77.	*Cedrus deodara*	Pinaceae	Wood, Leaves	Ugadi Vinayaka Chavithi	LC
78.	*Origanum majorana*	Lamiaceae	Leaves	Bathukamma Vinayaka Chavithi	LC
79.	*Jasminum auriculatum*	Oleaceae	Flowers	Bathukamma Vinayaka Chavithi	LC
80.	*Solanum indicum*	Solanaceae	Fruits, Leaves	Bonalu	LC
81.	*Evolvulus alsinoides*	Convolvulaceae	Whole Plant	Nagula Chavithi Vinayaka Chavithi	LC
82.	*Punica granatum*	Lythraceae	Leaves, Fruit	Ugadi Vinayaka Chavithi	LC
83.	*Artemisia vulgaris*	Asteraceae	Leaves	Vinayaka Chavithi	LC

LC – Least Concern NT – Near Threatened
EN – Endangered NE – Not Evaluated (locally rare or declining)

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