

Chapter 11

Grass diversity of Siddheswar temple: ethnobotanical significance of a sacred grove

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Abstract: Sacred groves represent unique landscapes where cultural faith and ecological conservation coexist. The present case study explores the diversity and traditional uses of grasses within the Siddheswar sacred grove of Cuttack, Odisha. A total of 23 grass species belonging to 18 genera were recorded, reflecting notable floristic richness within this culturally protected site. Many of the documented grasses possess ethnobotanical value and are traditionally used by local communities across the world for healthcare, animal husbandry and nutrition. Species such as *Alloterospis cimicina* are used in the management of diabetes and indigestion, while *Chrysopogon aciculatus*, *Saccharum spontaneum* and *Cymbopogon citratus* are associated with treatments for digestive and nervous ailments. Religiously important grasses like *Cynodon dactylon* contribute to primary healthcare practices, whereas *Chloris barbata*, *Aristida setacea* and *Eragrostis pilosa* are mainly employed in veterinary care. Several species also serve as valuable fodder and food resources, though a few lacked recorded traditional uses. The present study highlights the role of sacred groves as living repositories of grass diversity and indigenous knowledge, emphasizing their ecological, cultural and conservation significance.

Keywords: Ethnomedicine, grass diversity, sacred grove

Introduction

Sacred groves act as traditional conservation units where religious beliefs ensure long-term protection of native flora and associated biodiversity (Onyekwelu et al., 2024). Siddheswar is a sacred grove centred around the ancient Siddheswar temple at Naraj (Figure 1), situated on the hilltop overlooking the Kathajodi branch of the Mahanadi River, which preserves diverse indigenous plant species, highlighting the role of cultural heritage in safeguarding ecologically valuable habitats. Sacred groves like Siddheswar play a crucial role in in situ biodiversity conservation (Sharma, 2018) by protecting native and often rare plant species through traditional beliefs and

cultural taboos that restrict exploitation ([Kandari et al., 2014](#)). They also function as ecological refugia, maintaining ecosystem services such as soil stability, microclimate regulation and preservation of traditional knowledge linked to sustainable resource use ([Khan et al., 2008](#)). Among the existing flora, grasses form an important component of sacred grove flora by contributing to ecosystem stability and resilience through soil binding, prevention of erosion and regulation of local microclimate ([Behera et al., 2025](#)).



Figure 1: Siddheswar temple on Naraj hill-top, Cuttack, Odisha

Their presence also supports trophic interactions and nutrient cycling, providing habitat and forage for insects, birds and small herbivores, thereby enhancing overall biodiversity and ecological functioning of sacred groves (Singh et al., 2022). But the lesser-known fact is that grasses are not only an important component of the ecological system, but they are an integral part of the folk medicinal system and significantly contribute towards the healing and livelihood of the people and fauna associated with them (Sharma et al., 2025). The present study was taken as an initiative to study the diversity of grass species in Siddheswar and document their ethnobotanical uses.

Methodology

The floristic survey of grasses (family Poaceae) was conducted within the sacred grove of Siddheswar, Cuttack, Odisha, India, to document species diversity. Field surveys were carried out during the peak growing season between July and September 2025 to ensure accurate identification following published literature (Behera et al., 2025).

Results and discussion

The field survey of Siddheswar, Cuttack, Odisha, recorded a total of 23 grass species belonging to 18 different genera. Several of the documented grasses were found to have ethnobotanical importance, being traditionally used for medicinal, veterinary or dietary purposes by local communities (Table 1).

Table 1: Grass list of Siddheswar temple and their ethnobotanical uses

Grass species	Common name	Plant part(s)	Use(s)
<i>Alloteropsis cimicina</i> (L.) Stapf	Bugseed grass, Summer grass	Whole plant	In diabetes and indigestion (Sharma et al., 2025)
<i>Aristida setacea</i> Retz.	Broom grass, Bristly needle grass	Whole plant, roots	To treat foot and mouth diseases in animals (Rajakaruna et al., 2002)
<i>Axonopus compressus</i> (Sw.) P.Beauv.	Carpet grass	Whole plant	As an herbal bath (He et al., 2021)
<i>Bambusa bambos</i> (L.) Voss (Figure 2)	Spiny bamboo, Bamboo	Shoots, leaves, roots,	Leaf decoction is useful in relieving

		stems and seeds	cough (Adnan et al., 2014)
<i>Chloris barbata</i> Sw.	Swollen finger grass	Whole plant	Used as a disinfectant in animal health care (Majeed et al., 2020)
<i>Chrysopogon aciculatus</i> (Retz.) Trin. (Figure 4)	Love grass, Golden beard grass	Root, flowers, whole plant and leaves	In the treatment of gastric disorders and fever (Satapathy et al., 2019)
<i>Chrysopogon zizanioides</i> (L.) Roberty	Vetiber grass	Whole plant	In skin ailments (Gunasekar et al., 2025)
<i>Cymbopogon citratus</i> (DC.) Stapf (Figure 5)	Lemon grass	Whole plant and leaves	Tea prepared from leaves used as a sedative for the central nervous system (Shah et al., 2011)
<i>Cynodon dactylon</i> (L.) Pers. (Figure 7)	Bermuda grass	Roots, leaves and whole plant	Decoction or juice is taken orally for menstrual problems (Mazzei et al., 2014)
<i>Dactyloctenium aegyptium</i> (L.) Willd. (Figure 10)	Crowfoot grass	Grain/seeds, whole plant, leaves and stems	Whole plant decoction is administered for treating smallpox (Malavika et al., 2024)
<i>Dendrocalamus strictus</i> (Roxb.) Nees (Figure 6)	Solid bamboo	Leaves	In cold and fever (Goyal et al., 2011)
<i>Digitaria abludens</i> (Roem. & Schult.) Veldkamp	Stalked crabgrass	-	-

<i>Digitaria bicornis</i> (Lam.) Roem. & Schult. (Figure 3)	Asian crabgrass	-	-
<i>Eleusine indica</i> (L.) Gaertn.	Indian goosegrass, Silver crabgrass	Whole plant, aerial parts, roots and seeds	Whole plant is used in the treatment of influenza and hypertension (Al-Zubairi et al., 2011)
<i>Eragrostis pilosa</i> (L.) P.Beauv.	Jersey love grass	Whole plant	Paste or decoction is used for dysentery in animals (Majeed et al., 2020)
<i>Eragrostis tenella</i> (L.) P.Beauv. ex Roem. & Schult.	Cane grass, Japanese lovegrass	-	-
<i>Eragrostis unioides</i> (Retz.) Nees ex Steud.	Chinese lovegrass	-	Used as animal fodder (Dangol, 2008)
<i>Panicum repens</i> L.	Torpedo grass, Bullet grass	-	Palatable fodder for animals (Sharma et al., 2025)
<i>Paspalum floridanum</i> Michx.	Florida paspalum	-	-
<i>Saccharum spontaneum</i> L. (Figure 8)	Kans grass	Aerial parts, roots	In Dyspepsia, a burning sensation (Das et al., 2024)
<i>Sporobolus diandrus</i> (Retz.) P.Beauv.	Smut grass	Whole plant	Palatable fodder for animals (Sharma et al., 2025)
<i>Urochloa distachyos</i> (L.) T.Q.Nguyen (Figure 9)	Signal grass	-	-
<i>Urochloa ramosa</i> (L.) T.Q.Nguyen	Browntop millet, Dixie signal-grass	Seeds	As grains for culinary uses (Bano et al., 2025)



Figure 2: Habit and habitat of *Bambusa bambos*



Figure 3: Inflorescence of *Digitaria bicornis*



Figure 4: Inflorescence of *Chrysopogon aciculatus*



Figure 5: Habitat of *Cymbopogon citratus*



Figure 6: Flowers of *Dendrocalamus strictus*



Figure 7: Inflorescence of *Cynodon dactylon*



Figure 8: *Saccharum spontaneum* in its habitat



Figure 9: Healthy population of *Urochloa distachyos*



Figure 10: Spikelets of *Dactyloctenium aegyptium*

Among the recorded species, *Alloteropsis cimicina* is used in the treatment of diabetes and indigestion, while *Chrysopogon aciculatus* (Figure 4), *Saccharum spontaneum* (Figure 8) and *Cymbopogon citratus* (Figure 5) are commonly employed for managing gastric disorders, fever, dyspepsia and nervous conditions. *Cynodon dactylon* (Figure 7) and *Eleusine indica* are used for menstrual disorders, influenza and hypertension, highlighting their role in primary healthcare. Several grasses such as *Chloris barbata*, *Aristida setacea* and *Eragrostis pilosa* are mainly used in animal healthcare, particularly for infections, dysentery and foot-and-mouth disease. In addition to medicinal uses, some grasses, including *Eragrostis unioides*, *Panicum repens* and *Sporobolus diandrus*, serve as palatable fodder for livestock, while *Urochloa ramosa* is consumed as a grain. However, a few species such as *Digitaria abludens*, *Digitaria bicornis* (Figure 3), *Eragrostis tenella*, *Paspalum floridanum* and *Urochloa distachyos* (Figure 9) were recorded without specific ethnobotanical uses. The results indicated that the Siddheswar sacred grove conserves and preserves grass diversity with medicinal, veterinary and nutritional uses, emphasizing the ecological and cultural significance of sacred groves in biodiversity conservation.

Conclusion

Siddheswar sacred grove serves as an important cultural, religious and ecological refuge for flora, fauna and humans associated with it. The grass diversity of the grove supports 23 species across 18 genera with varied ecological and ethnobotanical significance. Many of the recorded grasses contribute globally to traditional human healthcare, veterinary practices and livestock nutrition, reflecting the close relationship between local communities and their natural surroundings. The documentation provides baseline data for its conservation and future research can be added to the rich cultural and ecological heritage of Odisha.

References

- Adnan M, Ullah I, Tariq A, Murad W, Azizullah A, Khan AL and Ali N. (2014). Ethnomedicine use in the war affected region of northwest Pakistan. *Journal of Ethnobiology and Ethnomedicine*. 10(1): 16. DOI: 10.1186/1746-4269-10-16
- Al-Zubairi AS, Abdul AB, Abdelwahab SI, Peng CY, Mohan S and Elhassan MM. (2011). *Eleusine indica* possesses antioxidant, antibacterial and cytotoxic properties. *Evidence-Based Complementary and Alternative Medicine*. 2011: 965370. DOI: 10.1093/ecam/nep091
- Bano S, Awasthi M, Tripathi AD, Agarwal A and Nandan A. (2025). Formulation and shelf life evaluation of nutrient rich *Urochloa ramosa* muffins enriched with *Madhuca longifolia* extract. *Scientific Reports*. 15(1): 30616. DOI: 10.1038/s41598-025-12486-6
- Behera SC, Mishra S, Mishra AK and Kumar S. (2025). Grasses of Chandaka-Dampara Wildlife Sanctuary. Chandaka-Dampara Wildlife Sanctuary, Odisha and Ambika Prasad Research Foundation, Odisha, India.
- Dangol DR. (2008). Traditional uses of plants of common land habitats in Western Chitwan, Nepal. *Journal of the Institute of Agriculture and Animal Science*. 29: 71-78.
- Das A, Das K, Mishra S and Kumar S. (2024). Medicinal Poaceae of India, Volume 1. Ambika Prasad Research Foundation, Odisha, India.
- Goyal AK, Middha SK and Sen A. (2011). *In vitro* antioxidative profiling of different fractions of *Dendrocalamus strictus* (Roxb.) Nees leaf extracts. *Free Radicals and Antioxidants*. 1(2): 42-48.
- Gunasekar CJ, Majdalawieh AF, Abu-Yousef IA and Al Refaai SA. (2025). Pharmacological and therapeutic potential of *Chrysopogon zizanioides* (Vetiver): a comprehensive review of its medicinal applications and future prospects. *Biomolecules*. 15(9): 1312. DOI: 10.3390/biom15091312
- He L, Teng L, Tang X, Long W, Wang Z, Wu Y and Liao L. (2021). Agro-morphological and metabolomics analysis of low nitrogen stress response in *Axonopus compressus*. *AoB Plants*. 13(4): plab022. DOI:10.1093/aobpla/plab022

- Kandari LS, Bisht VK, Bhardwaj M and Thakur AK. (2014). Conservation and management of sacred groves, myths and beliefs of tribal communities: a case study from north-India. *Environmental Systems Research*. 3(1): 16. DOI: 10.1186/s40068-014-0016-8
- Khan ML, Khumbongmayum AD and Tripathi RS. (2008). The sacred groves and their significance in conserving biodiversity an overview. *International Journal of Ecology and Environmental Sciences*. 34(3): 277-291.
- Majeed M, Bhatti KH, Amjad MS, Abbasi AM, Bussmann RW, Nawaz F, Rashid A, Mehmood A, Mahmood M, Khan WM and Ahmad KS. (2020). Ethno-veterinary uses of Poaceae in Punjab, Pakistan. *PloS One*. 15(11): e0241705. DOI: 10.1371/journal.pone.0241705
- Malavika R, Nath MR, Jayan V, Kumar HH and Athulya. (2024). *Dactyloctenium aegyptium*: a review of its pharmacological properties. *International Journal of Creative Research Thoughts*. 12(10): b74-b79.
- Mazzei R, Genovese C, Magariello A, Patitucci A, Russo G and Tagarelli G. (2024). Plants in menstrual diseases: a systematic study from Italian folk medicine on current approaches. *Plants*. 13(5): 589. DOI: 10.3390/plants13050589
- Onyekwelu JC, Agbelade AD, Stimm B and Mosandl R. (2024). Role of sacred groves in southwestern Nigeria in biodiversity conservation, biomass and carbon storage. *Environmental Monitoring and Assessment*. 196(3): 269. DOI: 10.1007/s10661-024-12407-6
- Rajakaruna N, Harris CS and Towers GHN. (2002). Antimicrobial activity of plants collected from serpentine outcrops in Sri Lanka. *Pharmaceutical Biology*. 40(3): 235-244.
- Satapathy S, Mahlik G and Mishra S. (2019). Ethnomedicinal values of *Chrysopogon aciculatus* (Retz.) Trin. *Journal of Biodiversity and Conservation*. 3(4): 91-93.
- Shah G, Shri R, Panchal V, Sharma N, Singh B and Mann AS. (2011). Scientific basis for the therapeutic use of *Cymbopogon citratus*, stapf (Lemon grass). *Journal of Advanced Pharmaceutical Technology and Research*. 2(1): 3-8.
- Sharma BP, Behera M, Agrahari D and Kumar S. (2025). Medicinally and Pharmacologically Important Grass Species of India. Ambika Prasad Research Foundation, Odisha, India.
- Sharma V. (2018). The role of sacred groves in biodiversity conservation. *Indian Journal of Research in Pharmacy and Biotechnology*. 6(1): 45-50.
- Singh P, Halli HM, Tomar M, Wasnik VK, Saini RP, Mahesha HS, Kumar S, Swami S and Yadav VK. (2022). Role of range grasses in conservation and restoration of biodiversity. In: Kumar P, Tomar RS, Bhat JA, Dobriyal M and Rani M (Eds.). *Agro-biodiversity and Agri-ecosystem Management*. Springer Nature, Singapore.