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Review Article

A note on *Desmostachya bipinnata* (Kusha): Pavitra grass of Vedic rituals used in Homa & Tarpana

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Abstract: Kusha (*Desmostachya bipinnata* (L.) Stapf) occupies a singular place at the intersection of South Asian ecology, culture, and medicine. Present review presented botanical description, distribution, ritual semiotics, ethnomedicinal knowledge and other significance of *kusha* with attention to its roles in Homa (fire oblations) and Tarpana (ancestral libations). Authors have outlined the historical sources and ritual praxis, summarize reported pharmacological leads and traditional formulations, discussed quality and sustainability considerations, and propose future research works connecting phytochemistry, conservation, and community livelihoods.

Keywords: *Desmostachya bipinnata*, kusha, darbha, pavitram ring, Vedic rituals, Homa, Tarpana, sacred grasses, ethnobotany, Ayurveda

Introduction

Grasses have shaped human subsistence, settlement, and spirituality (Foster et al., 2025). Among them, *Desmostachya bipinnata* popularly known as kusha, darbha, or khar is revered across the Vedic and post-Vedic corpus (Shah et al., 2012; Figure 1). The plant's tough culms and persistent tussocks embody ideas of purity, continuity, and ritual protection; its mats and rings mediate boundaries between

sacred and profane during sacrificial rites. Parallel to these symbolic functions, *kusha* stabilizes soils, offers seasonal thatch and cordage, and features in folk pharmacopoeias of the Indian subcontinent. The ritual centrality of *kusha* is especially visible in Homa and Tarpana. In fire rituals, bundles of *kusha* serve as implements for handling offerings and as protective amulets; in obsequial rites, the grass delineates ritual space and channels libations to ancestors (Putta et al., 2923). These uses are codified in *Śrauta* and *Gṛhya* sūtras and persist in contemporary practice with regional variation. Despite its prominence, comprehensive syntheses uniting botany, ritual praxis, and applied research remain scarce. Present review integrates multidisciplinary threads to show how a culturally “sacred” species can be studied with the same ecological and pharmacological rigor afforded to conventional medicinal plants while respecting its ritual sovereignty.

Figure 1: *Desmostachya bipinnata* planted in State Botanical Garden for educational purposes

Morphology: Culms stout, leaves rigid, linear, tips setaceous, margins minutely scarbrid; mouth of sheaths with or without long hairs (Figure 2). Panicle strict, racemiform, linear or oblong, grey-green, bearing densely secondly arranged spikelets or spikelets borne direct on the main rachis above (Figure

3); panicle sometimes interrupted at base and narrowly pyramidal; banchlets glabrous or hisipidulous; rachilla easily disarticulating. Upper glume twice as long as the lower. Lemmas cvate, obtuse or apiculate when unfolded, coriaceous, lateral nerves reaching about half-way to margin, keels scaberulous; palea nearly as long, reduplicate, keels microscopically scabrid. Caryopsis obliquely ovoid, obscurely trigonous (Saxena and Brahmam, 1996).

Figure 2: Leaves of *Desmostachya bipinnata*

Distribution: It is native to arid and semi-arid tracts of South Asia, extending west to the Middle East and North Africa. In India it thrives on sandy alluvium, riverine banks, fallow fields, bunds, and degraded grasslands from the plains up to ~1500 m. Ecologically, it is a pioneer on disturbed soils: roots bind substrate, reduce erosion, and improve infiltration (Saxena and Brahmam, 1996).

Cultural-religious significance and ritual semiotics: References to *kusha/darbha* appear across *Saṁhitā*, *Brāhmaṇa* and *Sūtra* literature, where the grass is associated with śauca (purity), rakṣa

(protection), and sattva (clarity). It marks ritual boundaries, insulates sacrificial implements, and is prescribed for seating, sprinkling, and handling offerings.

Figure 3: Inflorescence of *Desmostachya bipinnata*

Tarpana (ancestral libations): *D. bipinnata* directs the flow of water and intention:

1. A single blade (or ring) is held while reciting *gotra* and ancestral names; the cut end may face the practitioner while the tip faces south, the cardinal of ancestors.
2. Rings are worn to maintain ritual purity and steadiness during libations.
3. Blades may be placed on the palms or on vessels as conduits linking libations to the *pitṛs*.

Material culture and preparation: The material culture surrounding *D. bipinnata* grass is steeped in ritual precision and ecological awareness. Harvesting is traditionally performed at dawn, often on auspicious lunar days, ensuring that the grass is imbued with ritual sanctity. Collectors prefer the middle portions of the culm, avoiding the tender tips and coarse basal sheaths to ensure durability and purity. After collection, the grass is carefully sun-dried and bundled, typically tied with cotton threads. These bundles are then processed according to their ritual use: blades are split and fashioned into *pavitram* rings, woven into mats (*kuśāsana*) for ritual seating, or cut into smaller segments for sprinkling (*prokṣaṇa*). Proper storage is essential to maintain potency; the dried bundles are kept in a dry, pest-free place and in some regions are lightly smoke-cured to deter insects. To uphold ritual efficacy, these materials are periodically replaced, reinforcing the notion of freshness and ritual purity in Vedic practice.

Ethnomedicinal and Ayurvedic perspectives: Across diverse folk traditions, *D. bipinnata* holds an important place as both a household remedy and a ritual plant. Decoctions and its ash (*bhasma*) are widely employed for their astringent and cooling properties, helping to manage minor bleeding, diarrhea, and burning sensations. Its diuretic and detoxifying effects are valued in urinary complaints, and *kusha-jala* water infused with blades of the grass is consumed during fasts and sacred rites to promote purification. Topically, poultices prepared from fresh blades are applied to minor wounds, insect stings, and skin irritations, while some oral traditions report the use of sterilized blades as “herbal sutures” for closing small cuts. In rural settings, chewed tips of *D. bipinnata* sometimes serve as natural toothbrushes, aiding dental hygiene (Rahman and Kumar, 2017).

Phytochemical and pharmacological notes: Literature reported the presence of structural carbohydrates (cellulose, hemicellulose, lignin), minerals (notably silica), and minor secondary metabolites. Reported bioactivities include broad antimicrobial screening, antioxidant assays, and wound-healing properties (Ibrahim et al., 2018; Krishnasamy et al., 2024; Putta et al., 2024).

Socio-economic dimensions: Ritual demand persists year-round with peaks during *Śrāddha*, eclipses, and major *Homa* cycles. Village collectors, temple suppliers, and urban ritual-goods markets form a small but steady value chain. Standardized grading can increase value capture for harvesters. Cultivation on farm bunds and community lands can reduce wild pressure while providing thatch and craft material.

***D. bipinnata* in Homa and Tarpana:** Documenting the role of *D. bipinnata* in Homa and Tarpana requires a systematic and culturally sensitive approach. The first step is context mapping, where the type of rite whether deity-oriented or ancestor-oriented is recorded along with the lunar day and the officiant’s *śākhā* or ritual lineage to understand doctrinal variations. Obtaining ethnographic consent

from priests and households is essential, ensuring that documentation respects community protocols and captures local variations without judgment.

Research gaps and agenda: Future research on *Desmostachya bipinnata* must adopt an integrative approach bridging phytochemistry, pharmacology, ecology, and socio-cultural studies. On the chemical front, season-linked metabolomic profiling is needed to understand variations in bioactive constituents, alongside investigations into silica organic matrix interactions and the targeted isolation of minor phenolics and terpenoids. Bioactivity research should explore wound-healing mechanisms, antimicrobial spectra relevant to skin and gut pathogens, and safety pharmacology to validate the use of *kusha*-infused water in ritual and therapeutic contexts. From a ritual ecology perspective, it is crucial to study how ritual demand influences harvest regimes and the structure of local grassland mosaics, supported by ethnographic mapping across regions and ritual calendars. Conservation and livelihood strategies could focus on community-managed *D. bipinnata* plots, participatory cultivation, and value-chain improvements such as standardized grading, drying, and storage methods to ensure quality and income generation.

Ethical reflections: Research on “sacred species” must avoid extractive documentation. Co-create protocols with ritual custodians, ensure benefit-sharing, and respect restrictions on photography or handling during rites. Where medicinal claims are investigated, communicate uncertainty and avoid medicalization of ritual practice.

Conclusion

Desmostachya bipinnata is more than a ritual prop. it is a resilient grass that knits soils, economies, and cosmologies. Honouring its roles in Homa and Tarpana while advancing botanical, pharmacological, and livelihood research can transform *D. bipinnata* into a model for culturally-rooted conservation and evidence-led traditional knowledge.

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