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Review

Few Sacred Trees as The Source of Bioactive Phytochemicals from Southern and South Western Districts of Tamil Nadu: An Ethnobotanical and Medicinal Compendium

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	Abstract
Published on: 19 Sep 2025	<p>Sacred trees occupy a unique position at the cross roads of cultural reverence, ecological sustainability and medicinal importance. For centuries, communities across India and beyond have worshipped these trees as divine symbols, protectors and life-sustaining entities. Beyond their spiritual and ethnobotanical value, sacred trees are rich reservoirs of bioactive phytochemicals with profound pharmacological potential. They yield secondary metabolites such as alkaloids, flavonoids, tannins, terpenoids, saponins and glycosides, many of which exhibit antimicrobial, antioxidant, anti-inflammatory, cardio-protective and anticancer properties. Despite their cultural significance and established role in traditional medicine, many sacred trees remain underexplored in modern phytochemical and pharmacological research. This compendium aims to integrate ethnobotanical wisdom with scientific evidence by documenting the medicinal value, phytochemical constituents and therapeutic applications of selected sacred tree species. It also underscores the urgent need for conservation in the face of deforestation, urbanization and habitat loss. By bridging ancestral traditions with contemporary biomedical research, this work highlights sacred trees as invaluable contributors to natural drug discovery, biodiversity conservation and holistic healthcare.</p>
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INTRODUCTION

Trees have been inseparable from human civilization, providing not only food, shelter and ecological balance but also spiritual guidance and medicinal remedies. Across cultural and religious traditions including Hinduism, Buddhism, Jainism and various Indigenous belief systems certain tree species have been revered as sacred,

embodying divinity, cosmic order and spiritual well-being. This reverence has often contributed to their conservation, leading to the preservation of unique ecosystems such as sacred groves and temple courtyards. A wide variety of forests in India, from wet evergreen to dry deciduous, are found in our country [1].

Ethnobotanical studies reveal that sacred trees are deeply embedded in traditional healthcare practices, where their leaves, bark, roots, fruits and flowers are used in remedies for ailments ranging from fever, diarrhea and respiratory disorders to skin diseases and metabolic conditions. Scientific research further validates these practices, showing that sacred trees produce a wide spectrum of secondary metabolites such as azadirachtin from *Azadirachta indica* (Neem), triterpenoids and flavonoids from *Mimusops elengi* (Bakul), and tannins and phenolic compounds from *Ficus religiosa* (Peepal) with diverse pharmacological activities.

In the modern era, where lifestyle diseases, antimicrobial resistance and ecological degradation pose pressing challenges, sacred trees represent an intersection of cultural heritage and biomedical potential. Their conservation is not only a matter of safeguarding traditions but also a strategic necessity for sustainable drug discovery and ecological health. This article compiles ethnobotanical knowledge and medicinal insights on sacred trees, providing a comprehensive perspective on their cultural importance, phytochemical richness and therapeutic promise.

Sacred trees

Sacred trees are specific species of trees that are considered holy, spiritually significant, or divine in a particular culture or religion. In India, many trees are regarded as sacred due to their association with gods, goddesses or ancient myths and they are often worshipped in temples, homes and public spaces [2].

Table 1. List of few Sacred trees, their myths, cultural significances, medicinal use and phytoconstituents.

S. No.	Sacred tree	Common name	Myth / Cultural significance / Medicinal use	Bio active Phytochemicals
1.	<i>Acacia nilotica</i> L	Babul	Bundelkhand girls decorate the spicy green branches of babul acts colorful flowers at the time of the festival called mammalian. They offer various fruits to the tree for the fulfillment of their wishes [3].	saponins, flavonoids, terpenes, tannins, sterols, phenols, alkaloids, and anthraquinones [4].
2.	<i>Aderanthera pavonina</i> L	Rakta kanchan	The red paste (commonly known as pilak) made by rubbing the wood upon a Meciot stone Sacred is used by hindus for making marks as forehead after bathing [5].	The seeds contain non protein amino acid, methylene glutamine and traces of ethledine glutamic acid [6].
3.	<i>Adansonia digitata</i>	Baobab	Sage Durvasa meditated under it; Ashok Sundari, daughter of Shiva, was created from it [7], [8].	Flavonoids (quercetin, kaempferol, catechin), Triterpenes, Sterols, Vitamin C, organic acids [9].
4.	<i>Aegle marmelos</i>	Bael	Residence of Goddess Lakshmi; leaves please Lord Shiva [10].	Alkaloids (aegeline, marmeline, skimmianine), Coumarins (marmesin, umbelliferone), Flavonoids, Tannins [11].
5.	<i>Annona squamosa</i>	Custard Apple	Mentioned in Rig Veda; flowers used for worship [12].	Annonaceous acetogenins (squamocin, annonacin), Alkaloids (anonaine, lirioidenine), Flavonoids, Saponins [13].
6.	<i>Areca catechu</i>	Areca Nut	Symbolizes Lord Ganesha; offered with betel leaves in rituals [14].	Alkaloids (arecoline, arecaidine, guvacine), Tannins, Flavonoids, Catechins [15].
7.	<i>Artocarpus heterophyllus</i>	Jackfruit	Leaves used as dishes in religious festivals.	Flavonoids (artocarpin, norartocarpetin, cyanidin), Lectins, Carotenoids, Phenolic acids [16].

8.	<i>Azadirachta indica</i>	Neem	Manifestation of Goddess Durga; core used in Jagannath temple idol .	Limonoids (azadirachtin, nimbin, salannin), Flavonoids (quercetin, rutin), Sterols, Tannins [17].
9.	<i>Bambusa vulgaris</i>	Bamboo	Flute of Lord Krishna made from it.	Flavonoids (orientin, vitexin, isovitexin), Phenolic acids, Silica, Alkaloids (minor) [18].
10.	<i>Bauhinia racemosa</i>	Aapta / Sonpata	Leaves exchanged as gold on Dussehra.	Flavonoids (kaempferol, quercetin), Tannins, Sterols, Glycosides [19].
11.	<i>Bauhinia variegata</i>	kovidara	Symbol on Bharat's chariot flag in Ramayana.	Flavonoids (kaempferol, apigenin, quercetin), Tannins, Saponins, Glycosides [20].
12.	<i>Bixa orellana</i>	Annatto	Tree Used in Hindu socio-religious rites in Assam [21].	Carotenoids (bixin, norbixin), Terpenoids, Flavonoids Tocotrienols [22].
13.	<i>Calotropis gigantean</i>	Madar	Flowers offered to Shiva; garlands to Ganesh and Hanuman [23].	Cardiac glycosides (calotropin, uscharin), Triterpenoids, Flavonoids, Alkaloids [24].
14.	<i>Cocos nucifera</i>	Coconut	Represents Shiva's eyes; [25].	Phenolic acids (caffeic, ferulic, p-coumaric), Flavonoids, Fatty acids (lauric acid, capric acid), Cytokinins (kinetin-like compounds) [26].
15.	<i>Couroupita guianensis</i>	Cannonball Tree	Flowers resemble naga (serpent); grown in Shiva temples [27].	Indole alkaloids, Triterpenoids, Flavonoids, Sterols [28].
16.	<i>Crateva religiosa</i>	Barna Tree	Leaves offered to Shiva; linked to planet Rahu [29].	Glucosinolates (methyl glucosinolate, glucocapparin), Flavonoids (quercetin, kaempferol), Saponins, Alkaloids [30].
17.	<i>Diospyros melanoxylon</i>	Tendu	Myth of Hanuman blackening its bark after burning Lanka [31].	Tannins, Flavonoids, Terpenoids, Saponins [32].
18.	<i>Ficus benghalensis</i>	Banyan	Sacred to Trimurti; women tie threads for husband's longevity [33].	Flavonoids (quercetin, rutin), Sterols (β -sitosterol), Tannins, Leucoanthocyanidins [34].
19.	<i>Ficus religiosa</i>	Peepal	Buddha attained enlightenment under it; connects earth and heaven.	Flavonoids (quercetin, kaempferol), Tannins, Sterols, Glycosides [35].
20.	<i>Saraca asoca</i>	Ashoka Tree	Sita stayed under it in Ravana's garden; Buddha was born under it [36].	Flavonoids (quercetin, kaempferol), Tannins, Glycosides, Sterols [37].
21.	<i>Tamarindus indica</i>	Tamarind	Linked to Ram and Lakshmana appealing to Rain God.	Organic acids (tartaric acid, malic acid), Flavonoids (apigenin, luteolin), Phenolic acids (ferulic, caffeic), Tannins [38].
22.	<i>Ziziphus mauritiana</i>	Indian Jujube	Associated with Shiva; red dates offered during Maha Shivaratri.	Saponins (jujubosides), Alkaloids, Flavonoids (spinosin, rutin), Tannins [39].
23.	<i>Acacia leucophloea wild (mimosaceae)</i>	White - barked acacia	<i>Acacia leucophloea wild (mimosaceae)</i>	tannins, saponins, flavonoids, glycosides, alkaloids, phenolic compound [40], [41].
24.	<i>Ailanthus excelsa Roxb.</i>	Indian tree of heaven	Cough and cold	quassinoids (ailanthone, amarolide, glaucarubol), alkaloids, tannins, flavonoids [42].

25.	<i>Alangium salviifolium</i> (L.f.) Wangerin	Sage – leaved alangium	Eye disease	alkaloids (alanginge, alagin, alangicine), triterpenoids, flavonoids, glycosides [43].
26.	<i>Albizia amara</i> (Roxb.)	Oil cake tree	Ulcer	saponins, flavonoids (quercetin), tannins, phenolic acids [44], [45].
27.	<i>Millingtonia hortensis</i> L.f.	Indian cork tree and tree jasmine	Root, leaf Skin disease, cough, lung disorder	iridoid glycosides, alkaloids, flavonoids, triterpenoids, essential oils [46].
28.	<i>Naringi crenulata</i> (Roxb.) Nicolson	Elephant nettle, mahavilvam	Vomiting	coumarins, flavonoids, limonoids, alkaloids [47].
29.	<i>Pongamia pinnata</i> (L.) Pierrc	Indian beech	Skin problems	furanoflavonoids (karanjin, pongamol), flavones, tannins, fixed oils, saponins [48].
30.	<i>Pterocarpus santalinus</i> L.f.	Red sandalwood	Inflammatory disease, skin disease	santalin pigments, pterostilbene, isoflavonoids, lignans, tannins [49].
31.	<i>Syzygium cumini</i> (L.) Skeels	Jamun , Indian blackberry	Abdominal pain, dysentery, sore throat	jambosine alkaloid, ellagic acid, gallic acid, anthocyanins, flavonoids, tannins [50].
32.	<i>Thespesia populnea</i> (L.) Sol.ex Corr. Serr.	Portia tree, Indian tulip tree	Join pains, rheumatism	flavonoids (gossypetin, gossypol derivatives), tannins, saponins, sterols, terpenoids [51].
33.	<i>Nyctanthes arbor-tristis</i>	Night jasmine	Leaf-Constipation for children, indigestion, Fever, Bark-Cold, constipation, Seeds-Induce hair growth, Flower-Headache	iridoid glycosides (nyctanthoside, arbortristoside), flavonoids, tannins, saponins, alkaloids, essential oils [52].
34.	<i>Randia obcordata</i> S.Watson	Crucillo	Fungal infections	alkaloids, saponins, flavonoids, tannins, phenolic compounds (less studied, but <i>Randia</i> spp. rich in iridoids) [53].
35.	<i>Magnolia champaca</i> L. Baill	Champa, champak tree	Flowers -Fever, Urinary infection, Leaf-Stomach pain	Alkaloids, Amino acid, Flavonoids, Sterols, Saponis, Tannins, Glycosides, Carbohydrate [54].
36.	<i>Diospyrous montana</i> Roxb	Mountain ebony	Bark-jaundice, Tuberculosis,, Roots-An abortifacient [29].	tannins, flavonoids, terpenoids, saponins, phenolic acids [55].
37.	<i>Dichrostachys cinerea</i> Wight et Arn.	Sickle bush	Leaf-Pneumonia and leprosy, Bark-Diarrhea and postpartum pain, Roots-Syphilis and leprosy, aphrodisiac	flavonoids, tannins, saponins, sterols, alkaloids (cinchonine-like compounds) [56].
38.	<i>Ficus virens</i> Dryand	White fig	fruits-Constipation, Seeds-Induce semen count	flavonoids, tannins, sterols, glycosides, triterpenoids [57].
39.	<i>Sapindus emarginatus</i> Vahi	Soapnut tree	Fruits-hairtonic, headache, snakebite, diarrhoea	saponins (sapindosides), flavonoids, tannins, alkaloids, triterpenoids [58].
40.	<i>Curcuma caesia</i>	Black turmeric	Pneumonia, Diabetes	curcuminoids (curcumin, demethoxycurcumin, bisdemethoxycurcumin), essential oils (camphor, borneol, cineole, turmerone, zingiberene), flavonoids, tannins [59].

41.	<i>Duranta erecta</i>	Sky flower	Malarial fever, Intestinal worms	alkaloids, saponins, flavonoids, steroids, triterpenoids, tannins, glycosides (duringins) [60].
42.	<i>Elaeocarpus angustifolius</i>	Rudraksham	Asthma, Epilepsy	alkaloids, flavonoids, tannins, phenolic acids, glycosides, fatty oils [61].
43.	<i>Jasminum grandiflorum L.</i>	Pichi poo	Mouth ulcers, Weak gums	essential oils (jasmone, benzyl acetate, linalool, indole), flavonoids, tannins, glycosides [62].
44.	<i>Nerium oleander L.</i>	Aralli	Scabies, Haemorrhoids.	cardiac glycosides (oleandrin, neriine, digitoxigenin), flavonoids, saponins, tannins [63].
45.	<i>Plumeria rubra L.</i>	Malai Arali	Rheumatism, Back pain	iridoids, triterpenoids, flavonoids, alkaloids, essential oils (plumericin, fulvoplumierin) [64].
46.	<i>Quisqualis indica L.</i>	Rangoon Mallikai	Ring worm, ulcer, fever	quisqualic acid (an amino acid derivative), flavonoids, tannins, saponins, glycosides [65].

CONCLUSION

Sacred trees embody an inseparable bond between culture, ecology and medicine. Rooted in mythology and worship, they serve not only as protectors of spiritual traditions but also as reservoirs of biodiversity and pharmacological wealth. The ethnobotanical wisdom surrounding these trees highlights their therapeutic roles in treating a wide spectrum of ailments, while modern research validates their bioactive compounds as potential leads for new drug discoveries. However, increasing deforestation, urban expansion and unsustainable exploitation threaten their survival. Protecting these sacred species is, therefore, not merely an act of cultural preservation but also a crucial step toward sustaining ecological balance and advancing natural drug development. Strengthening conservation strategies through community participation, scientific exploration and policy support will ensure that the sacred legacy of these trees continues to benefit both present and future generations.

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